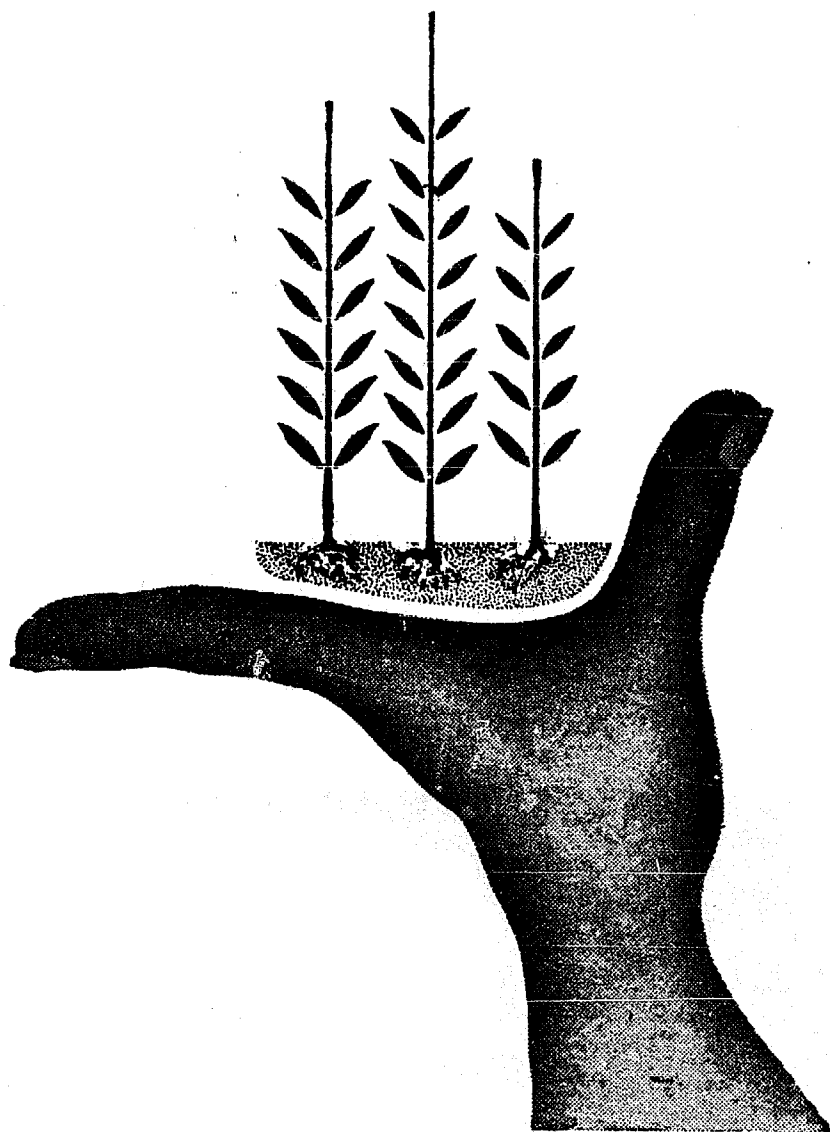


THE SAMAKA GUIDE

To Homesite Farming



Prepared By
SAMAKA SERVICE CENTER
Manila
Philippines
1973

Dedication

To the 1973 Samaka Guide

The founder and moving spirit of the SAMAKA concept, as well as author of *The Samaka Guide*. Mr. Colin M. Hoskins, passed away in 1967. Similarly, Col. Andres Soriano, whose moral support and abiding interest in SAMAKA activities continued until his death in 1964, must be noted. Dean Conrado Benitez, a contributor to *The Samaka Guide* and a former Trustee of the Center, also passed away in 1971.

This 1973 issue of *The Samaka Guide* is dedicated to the memory of Mr. Colin M. Hoskins, Col. Andres Soriano and Dean Conrado Benitez by a grateful incumbent Board of Trustees who will remember their leadership and friendship long after the last copy of *The Samaka Guide* will have been put to the good use they envisioned.

SAMAKA SERVICE CENTER, INC.
The Board of Trustees

Notes on The SAMAKA Guide

The first printing of *The Samaka Guide* was published in 1954, and the 10,000 copies were quickly exhausted. In 1956 second printing without revision was made and distributed chiefly to the public and private schools.

There has been such an insistent demand for this booklet that Samaka Service Center has decided to print a revised edition in standard book form, to supply the tens of thousands of people who seem to be so eager to have a home garden and keep poultry, pigs and other livestock.

This revised edition differs from the previous editions by including two new features and amplifying another subject.

In order to promote the milk production of the Filipino family we have included our previously presented Circular No. 1, entitled "Let Us Raise Goats on Our Homesite Farm." It has been found that milk goats produce a superior quality of milk, especially suited for infant feeding and cheese making, and they need very little extra feed. This booklet was originally published in 1956, through the generous financial support of International Harvester Company.

The other subject we have added is "The Family Chicken Cage," which describes the most efficient type of poultry project for the small homesite, especially in regions where there are commercial hatcheries and distributors of certified poultry feeds.

In view of the growing use of fertilizer and the nationwide appreciation of farmers that fertilizer offers one of the simplest ways to increase crop yields, we have written at greater length on the subject of fertilizers. This edition discusses not only the commercial fertilizers, but gives pointers on making our own fertilizer with the use of vegetable wastes mixed with manure.

This 1973 printing of the *The Samaka Guide* brings the total number of copies printed to 95,000. In addition, 10,000 copies of *The Guide* in Pilipino translation (*Ang Gabay ng Samaka*) have been issued.

Acknowledgments

The author of *The Samaka Guide* is Colin M. Hoskins, a longtime American resident of the Philippines who for over fifty years has been closely identified with various phases of Philippine agriculture. However, he modestly claims that he is the "compiler" of the agricultural wisdom contained within these pages. Yet his skill in putting into plain and simple English the highly technical subjects here treated, entitle him to full credit as author.

When *The Samaka Guide* was first published in 1953, all printed material on gardening was gathered and used as the basis for the book. A mimeographed copy of the first draft was sent to seventy-five experts for comments and corrections. It was after these comments and corrections were received, evaluated, and reconciled that *The Samaka Guide* was put in final form.

Among the many specialists in agriculture who assisted the author with their technical advice, thanks are especially due to the members of the faculties of the University of the Philippines College of Agriculture at Los Baños, the Araneta University, and the Central Luzon Agricultural College at Muñoz. Thanks are also due to the officials of the Bureaus of Public Schools, Plant Industry, Animal Industry and Agricultural Extension; and to the private individuals who gave generously of their time and knowledge. The illustrations are the work of Mr. F. N. Gatmaitan of the Bureau of Animal Industry.

Direction of the press work and final format was entrusted to Mr. Rafael Zulueta, Trustee and Secretary of Samaka Service Center, Inc.

Finally, we are indebted to Col. Andres Soriano, President of San Miguel Brewery, and to San Miguel Brewery itself, whose moral support and financial contribution made possible the publication of the first two editions of *The Samaka Guide*. With the passing of Col. Andres Soriano, Mr. Andres Soriano, Jr., President of The San Miguel Corporation, has kindly accepted the Samaka Service Center invitation to continue his father's solicitude for SAMAKA.

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Living the SAMAKA Way

What SAMAKA Means

The name "SAMAKA" is an abbreviation of "Samahan ng Masaganang Kakanin," which in English means a united effort of a group to have more plentiful food for their families.

Although "Samahan" also means "association," SAMAKA is *not* an organization. It is a plan, an idea, a way of life, the road to a *better* way of life.

So, every farmer who, with his family, uses his home lot and his spare time to produce more and better food for his family; who makes the fullest use of the land and the time at his disposal; who encourages and helps his neighbors through community spirit to do the same—such a farmer can proudly call himself a SAMAKA Farmer.

We all know that when most of the people in a barrio or sitio decide to follow a certain custom, that custom becomes the habit of the community. Your success in adopting the SAMAKA Plan will encourage your neighbors to do the same. So let us all get together in our barrios and decide to adopt this better way of life, and all become SAMAKA farmers.

What SAMAKA Does

By becoming SAMAKA farmers, *we decide with our neighbors* that we will unite in purpose and action to improve our condition of life by raising more food in our home gardens for the better health and nourishment of our families.

Why Some Of Us Have No Home Garden

Nearly all of us have at our disposal a home lot of between 400 to 1,000 square meters on which we can raise food. Many of us have neglected using this road to a richer life for a number of reasons.

Some of us have tried a vegetable garden, but found it was destroyed by roaming pigs, goats and carabaos.

Maybe you planted a large number of tomatoes in your garden, some to eat and some to sell. But when your neighbors and relatives and compadres had admired your big luscious tomatoes, and you could not refuse to give them some, you found out you had no more tomatoes. Therefore, you did not continue.

Many of us are rice farmers, and maybe have not had much experience in growing fruits and vegetables and in raising livestock. When we tried to learn about this, we did not know where to get the information we needed. When we heard that the government had vegetable seeds for distribution, we could not find out where we could get some.

SAMAKA, The Road To Success

The SAMAKA way is the way to overcome these difficulties. When all, or nearly all of the families in a sitio decide that they will *all* establish Subsistence Farms around their homes, the SAMAKA farm

of each one of us can be a success.

With *all* of us adopting the SAMAKA plan, everyone will construct a fence around his lot, to keep out roaming animals.

Everyone will keep his own pigs in a pig pen, or tethered, so they cannot roam and damage the gardens of neighbors and pick up disease.

If *all* of us have a vegetable garden and fruit trees, our fruits will not be taken by relatives and compadres, because they also will have gardens.

If *all* of us agree to raise our pigs to maturity, and if our SAMAKA leaders show us the easy and cheap way of preserving pork for many months, our family will have pork meat all the time.

If we neighbors adopt the SAMAKA way of life, the government has promised to bring to us selected seeds for our gardens, and also furnish us with fruit trees and breeding animals of good quality.

How To Go The SAMAKA Way

Any civic spirited local group or individual can plant the SAMAKA idea in a community. It can be sponsored by a PUROK or POOK association, by a barrio council, by a local stem of PRRM, by a 4-H Club, or any other barrio improvement group. A separate organization is not necessary. The SAMAKA plan may be absorbed as part of the program of any of these local groups, or those of similar purpose. The principal thing is for the barrio people themselves to take the initiative and provide the leadership to make the SAMAKA way

of life the more prosperous and happier way of life for all or nearly all of the people of the barrio or sitio.

As soon as most of the families of our barrio or our sitio have earnestly decided we want to live the SAMAKA way, we should select a leader we trust to act as our spokesman. Maybe it will be the head of the local group that has called us together to decide on the SAMAKA way, or we may select someone else as our leader. When our leader is selected he notifies the Bureau of Agricultural Extension that the people in his barrio want to follow the SAMAKA plan.

At once things will begin to happen. An Agricultural Extension Man will soon come and find out what seeds we need, what help is needed to increase our flocks of chickens with better kinds. He will examine our soil and discuss with us the best garden crops we should grow. He may be able to send a breeding boar to the man we select as the best pig raiser, for our use, so we can get better pigs for our SAMAKA subsistence farms.

Meanwhile we will not be idle. We will start fencing our lots. We will begin preparing our land. We will each begin getting materials together to build our piggery and poultry house. We can get a copy of this Guide telling us how to do some of those things which we do not know already, or telling us how to do them better.

Once we and our neighbors have become SAMAKA farmers, we will suddenly see the entire village awakening to this new and better

way of life. If one of us sees a fellow SAMAKA farmer neglecting his obligations, we will help him or counsel him, as a good neighbor.

The SAMAKA way of life is not something we start, and then expect it to continue by itself. Deciding to live the SAMAKA way is only planting the seed of the tree. By our individual and united efforts, following a steady course together, we will water the seed of the SAMAKA way, so that it shall grow steadily into a giant tree to give all of us the blessings of neighborly shade and the abundant fruits of happy living.

Our SAMAKA Leader

We all know that group action needs leadership, in order to get the best results. The leader we select to guide us on the SAMAKA way must have our confidence and support. So we must select him carefully. He should be one of the best farmers in our town, intelligent, honest, and hard working.

The task of the SAMAKA leader is not easy. He is the man who will be our spokesman in getting the public services for farmers which we as citizens have a right to.

He will be the one who orders seeds for us when we need them and who will receive the seeds for distribution.

He will sometimes have to go to the provincial capital to arrange to get breeding animals sent to our town, or to get good fruit trees for us to plant in our garden.

When we need fertilizer in small quantities, he will have to

store the sacks at his house for distribution.

Sometimes he may get the things we need on credit from the government, and he will have to guarantee that we will pay for our share.

If our leader is a good one, he will be spending too much time helping us, so that he will not be able to give enough time to his own SAMAKA garden.

It is therefore the obligation of each SAMAKA farmer to pay for our leader's time, not with money, but by giving him an hour or two of labor in his garden, equal to the time and effort he is giving us. This is something like the "bayani" system we all understand.

Assistant Leader

We may decide to select an assistant leader to do some special task for all of us, which our leader cannot do as well.

In many barrios it would be a good plan to have a leader in charge of pig raising. There may be a SAMAKA farmer among us who is better than the others in raising pigs. We can appoint him our leader for pig raising and he will get the government boar to improve the breed of pigs in our town, and advance us one or two small piglets which we can raise at our house. He will be given special training by the Agricultural Extension Man, in the care of pigs, how to raise them, and how to kill them.

In the same way we SAMAKA farmers may want a special leader for chickens and ducks, or a leader

to become an expert in breeding and raising rabbits and goats.

The advantage of having assistant leaders for special tasks is that the government can give him special training, so that he can help all of us every day. He will be one of us, not a stranger.

It may also be a good plan to select some SAMAKA housewife as Leader In Charge of Food Preserving. Maybe there is a home economics graduate or teacher in our barrio who knows all about preserving. In the chapter of this book on "Home Food Preserving," there are useful hints on how to get this profitable activity started.

Marketing Our Surplus

The SAMAKA farmer does not ordinarily sell the produce from his subsistence farm. It is usually just enough for his family needs. Of course there will be more than enough of seasonal fruits and vegetables, which will spoil if not used quickly. By selling the excess in the market, there is a chance to earn extra money.

But the SAMAKA farmer should *never, never* sell his produce if it will mean less abundant food for his family. This is true, because the purpose of the SAMAKA farm is precisely better nourishment for our family, so as to make stronger and healthier bodies.

Some of us will be tempted at times to sell a dozen eggs to some buyer who comes around and of-

fers us 5 or 10 centavos per egg. Maybe we need some money very badly. But as good SAMAKA farmers, we resist this temptation, and only sell things our family does not need.

When Storm or Drought Strikes

When a typhoon or flood destroys our palay and corn fields, when a long drought causes our fields to dry up without yielding a harvest, we barrio farmers face starvation.

When these acts of God visit our fields, our SAMAKA home farm may be our only source of food for a long time.

If we have followed the SAMAKA plan, we will have some preserved pork in the kitchen. Our chickens in their elevated coops are still alive to give us chicken meat and eggs. We can save our pigs from drowning. Even in times of drought we can water our small home gardens even though our fields remain dry. So we will have corn and other garden foods to keep us alive. If our garden is flooded or broken by a bad storm, we can perhaps still find some root crops, such as gabi, cassava, and camotes, which are not destroyed. The bananas may still be standing, and if we have planted a rimas tree, we have our breadfruit.

So we can thank God for having guided us to become true SAMAKA farmers, producing abundant food in good times, and saving us from hunger when disaster strikes.

How To Plan Our Homesite Farm

When you decide to become a SAMAKA farmer you will want to plan carefully where you will plant your different vegetables and fruit trees. You must decide the best place to locate your poultry house and pig pen. If you are going to have a small fishpond you must choose the best spot.

On page 10 we show plan of a typical barrio home lot of 600 square meters, and the way many farmers think it should be arranged.

But what if we do not have even 600 square meters of land for our home? In that case it will pay us rich rewards to increase the size of our home lot.

When we hear this suggestion, our first thought is that we need all of our land for growing our main crops — our rice, or our corn, or our sugar. Yet when we start to figure it out we soon realize that our home garden brings us more profits than our main crop. Suppose we now have a homesite of only 400 sq.m. If we extend our garden by adding only 250 square meters, taking this small patch from our palay fields, we will lose about one cavan of palay. On this extra 250 square meters of home garden we can raise corn, vegetables, fruits, chickens and pigs which will be worth 10 to 20 cavanes of palay. So we will be sacrificing something of small value

for more abundant food to give strength, health, and happiness to all the members of our family.

Many of us are tenant farmers planting palay. Our palay land is already small, and the owner of the land does not want us to enlarge our home garden. But according to the Agricultural Tenancy Law, we have a right to use not less than 1,000 square meters of the land we cultivate for our home garden. So we decide to use the maximum land the law says we may use, so as to raise more food in our home garden for our own use. What we raise in our home lot is all ours; none of it has to be given to the landlord.

When we reach this decision, to dedicate not less than 1,000 square meters for home food production, we know we are doing the wise thing. We are now ready to plan how we will use our home lot, so let us examine the suggested plan.

If our lot is already established, we cannot follow the plan here shown exactly. The plan will give us some ideas that we may be able to use in our present home lots. If we have no garden or trees at present we may like to follow this plan.

In the following pages there is much detailed information on how some barrio farmers have been successful in raising more food for their families on their small home lots.

Our Home Water Supply

Many of us find trouble in getting a sufficient supply of water for our home gardens and for drinking. When we have a good artesian well nearby, that is all right for our supply of drinking water. But when we are far from an artesian well, we are often tempted to drink water which is not pure, and which may bring sickness to our family, such as dysentery.

Also, the artesian well (if there is one) does not give us the water we need for our vegetable garden, laundry, and bathing.

For centuries, therefore, we barrio farmers have taken our water from a nearby river or spring, or have dug a well in our backyard.

Garden Wells

It is both convenient and cheap to have our own garden well, wherever there is sufficient underground water. Many of us have had such wells, but we have not always observed the best practices in making use of them. So we have here gathered together the good practices of barrio farmers in many provinces, on how to build and maintain a well on the home lot.

The purposes of the garden well are to provide abundant water for our garden and livestock, and at the same time a handy supply of water that is safe to drink, and easy to bring to the house for the washing of dishes and clothes and for bathing.

Location Of Well

The water which supplies our well travels underground. It is therefore necessary to dig our well where the underground water will not carry germs of diseases to our well. The two important points on location of the well are these:

First: If possible, it should be on higher ground than any surrounding houses that might carry filth to it, through seepage.

Second: It should be at least 10 meters from any toilet, stable, or kitchen.

Types Of Wells

We have found three types of garden wells which are easy to make and should give plenty of water for the home garden and for household use. They are the following:

The *open* dug well, which is covered with boards, and lined with stone, bricks or bamboo.

The *sealed* dug well, in which a pipe is placed, and then the hole is filled up.

The *hand-driven* well, which is made by driving a 20-foot length of pipe into the ground until water is reached.

Open Dug Well

Many open wells are simply mud holes. A good garden well should be a round hole 1 to 2 meters across, with straight sides supported by a lining or wall.

The best lining is stone or brick. Field and river stones can be ce-

mented into place with a mixture of lime and clay mortar, and will serve us very well. If we cannot get these materials we can use bamboo. (Fig. 1).

The well lining is to keep the sides of the well from falling in, to keep out surface filth, and to keep the children and livestock from falling into the well. Therefore, the lining should extend one meter above the ground. On the outside of the projecting well lining we should build a brick or stone wall, or a thick clay wall the way we make a pilapil in our rice field.

The well head (Fig. 2) should also be covered with wood, to keep

livestock and rubbish from falling in.

Sealed Dug Well

Another type of garden well which gives abundant water and is easy to keep clean is used in many barrios. It is cheaper to build than the well with a lining, but we must use a pump to draw the water. This is how we do it:

First, we dig a round hole 1 to 2 meters across, until we reach below the underground water level as far as we can go conveniently. If the earth down below is firm enough, we enlarge the hole at the bottom so it will hold more water.

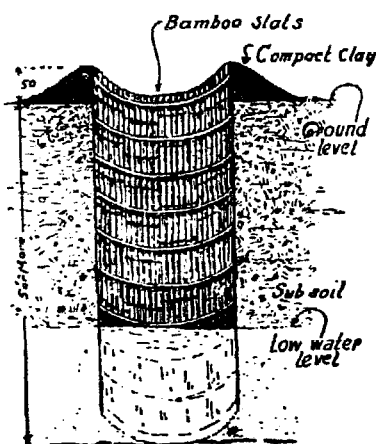


Fig. 1. Bamboo lining for well prevents earth from collapsing.

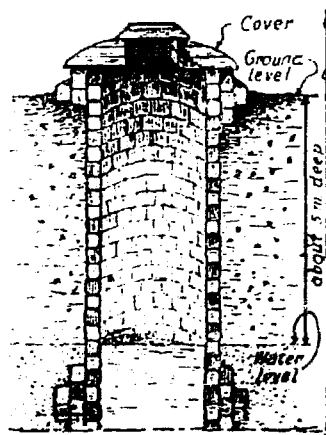


Fig. 2. Garden wells must be covered to keep them clean.

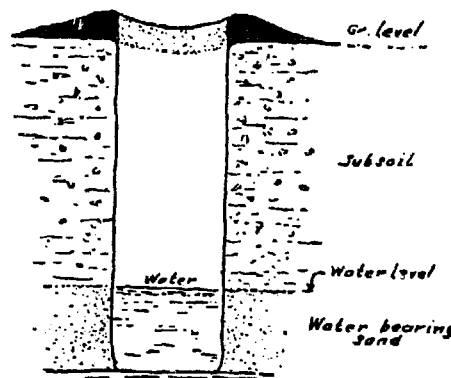


Fig. 3. An open well 6 to 7 meters deep can be made sanitary.

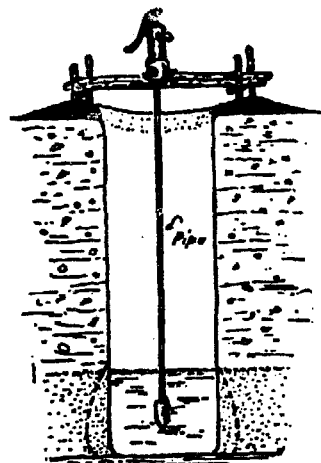


Fig. 4. First, we install a length of pipe and a hand pump.

During the excavation we can support the walls with bamboo. (Fig. 3).

Second, we place a length of ordinary 1 or 2 inch pipe in the center, supported in a vertical position so as not to touch the earth at the bottom of the well. (Fig. 4).

Third, we place large river boulders or stones in the hole, up to the top of the water level or a little more. Next we pile on smaller stones, then smaller stones until we are near the top, and finally we pour in the earth we have removed until we fill the well and form a mound around the top. (Fig. 5).

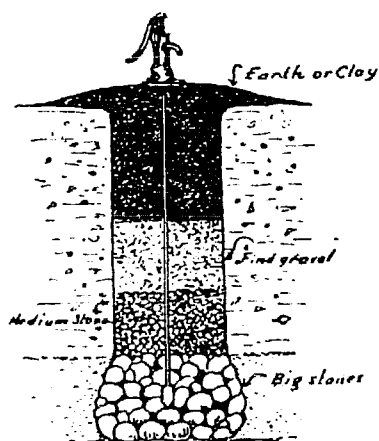


Fig. 5. Then we fill well with stones and gravel and seal it with earth.

This type of well gives us a large deposit of water at the bottom, and because the upper part is sealed with earth, even seepage from above is filtered through the earth, and helps prevent the water from becoming impure. We do not have to build a brick or stone wall lining or a wooden cover, and there is no repair work to be done.

Hand Driven Well

A few years before the outbreak of the war in 1941, a new type of

garden well became popular in the Philippines. Farmers in many barrios got clean drinking and household water in their yards by this system, and if the underground water was abundant, they had plenty for their gardens.

This well is made by driving one 20-foot length of small pipe (1-1/4 inch pipe is the best size) down into the ground until we strike water. With a cheap hand pump at the top, we can get a supply of clean water at all times. In some places such wells gave a flow of water without pumping, just like an artesian well.

Any SAMAKA farmer who can afford the pipe and pump can have this kind of well, if there is underground water on his lot not deeper than 6 meters. To make the cost less, we should follow the bayani system, so our homemade well-rig can be for community use.

Materials Needed

Parts of well.—To make a hand-driven well, the farmer on whose land the well is built must supply the following things which are permanent parts of his well:

- 1 length (20 feet) of 1-1/4 inch galvanized pipe.
- 1 well-point, 60 centimeters long.
- 1 hand pump 1-1/4 inches (Fig. 6)

The cost of these things in Manila today is less than ₱50. If we could buy them through our government, they would cost about ₱30.

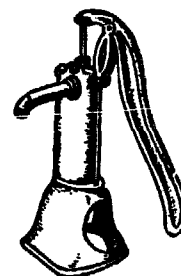


Fig. 6. A useful hand pump costing little.

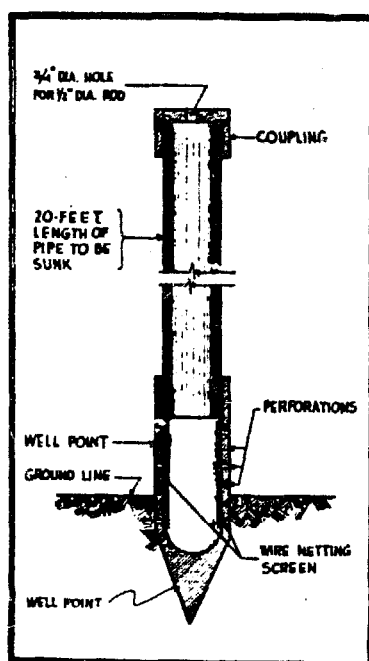


Fig. 7. This shows design of the well point which we buy at the hardware store. It is sharp, so we can drive it into the earth, and has holes to let in the underground water, and a screen to keep out large pieces of gravel. It is connected to our well pipe.

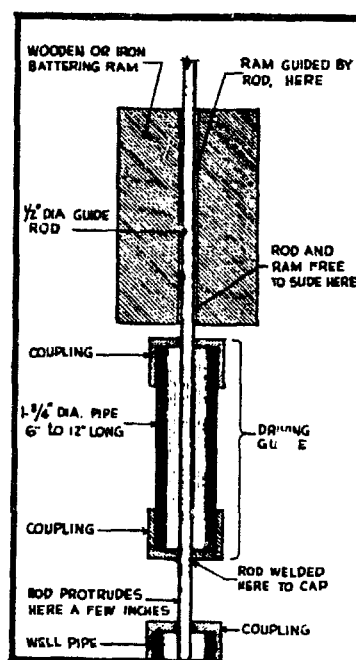


Fig. 8. This shows how the 1/2-inch iron bar guides the battering ram of weight straight down, where it strikes the driving guide placed above the well pipe, to protect it from damage. Any blacksmith can make a driving guide like the one shown.

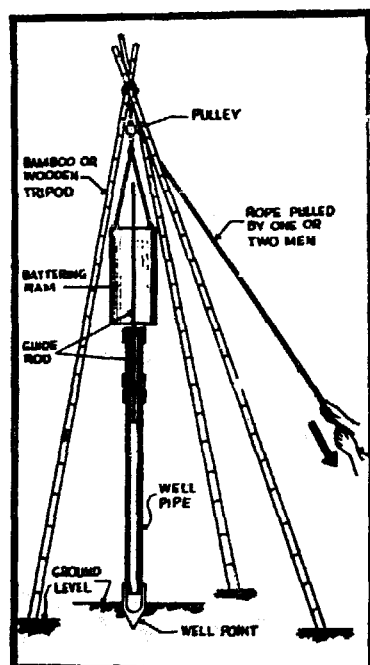


Fig. 9. This shows the bamboo well rig set up, ready to drive the well pipe into the ground. One or two men pull on the rope to lift the heavy weight or battering ram, and let it fall to drive the pipe deeper and deeper into the ground.

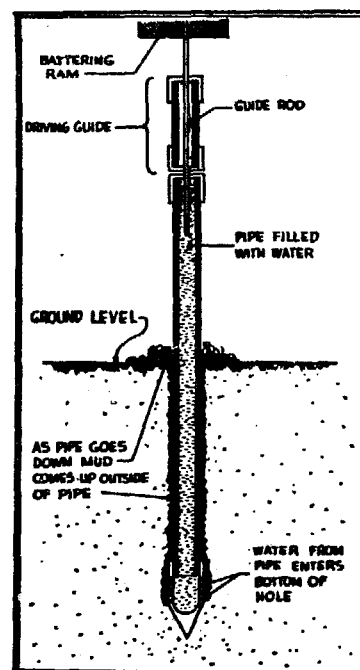


Fig. 10. When the well pipe has been driven into the ground, it is filled with water. The water goes through the holes of the well point and softens the earth. As we continue driving the well pipe down, the water in the hole becomes mud, and is pushed up to the surface around the outside of the pipe.

Equipment For Driving Well

The equipment needed for driving the well consists of the following:

- 3 long bamboos.
- 1 heavy piece of iron or block of wood, weighing about 100 kilos, to use as a driving ram.
- 1 pulley.
- 1 long piece of strong rope.
- 1 reinforcing iron bar, 1/2 inch.
- 1 driving guide.

In most barrios we can supply or make all of these things except the iron bar and driving guide. These will cost our group about P5.00. The illustration shows how the driving guide is made. This driving guide is usually worn out by the time one well is driven and must be replaced.

Driving The Well

To show more easily how this well can be driven, we are presenting a series of pictures, showing each step in the procedure, which any intelligent SAMAKA farmer can follow. (Fig. 7, 8, 9 & 10).

Following these simple methods, we should finish our well in one or two days. Sometimes as we drive the point down, we hit a large rock which our point cannot penetrate. The only thing to do then is to pull out the pipe and try another spot, until we find a location without obstruction.

Sometimes we find that the underground water supply is not quite enough for our garden. Then the thing to do if we need more garden water is to drive another pipe close to the first one, connecting both pipes to the same

pump. Another alternative is to change to the Sealed Dug Well described before, which will store more water.

It may happen that we do not strike water at 6 meters depth. In that case we can attach another length of pipe to the first and increase the depth until we reach the water. However, if we do this we cannot use a shallow well pump. We must install the more expensive deep well pump.

Taking Water From The Well—Pumping

We all know many ways of drawing water from the well, but we often forget that if we use a dirty container, the water in the well becomes dirty, and the germs left by the dirty container may make the water inside the well unsafe for drinking. Therefore, unless we have a pump, the water from the garden well should always be boiled before drinking.

The traditional ways of lifting water were invented by our ancestors long before men learned to make iron. With the use of iron, we now have a much better way to raise our well water, and that is by the use of iron hand pumps. These pumps keep the water in the well cleaner and save labor. It will be to our advantage, therefore, to save enough money to buy one of these inexpensive hand pumps, which cost P12 to P20, and are easy to install. (Fig. 11). This kind of pump will bring water from a depth of 6 meters.

The old fashioned hand pump with the open top, called the pitch-

er pump, is no longer recommended. It is very insanitary, because we often pour dirty water into the top to prime it. Also it does not allow us to pump water higher than the elevation of the pump. The newer kind of hand pump is called a "hand force pump" and is closed at the top. Also it has an outlet to which we can attach a pipe or a hose, and pump water to a high tank. The hand force pump costs only a few pesos more than the undesirable pitcher pump.

Once we have a pump, we can plan to connect it to a small water tank, which we can elevate and in this way furnish running water to our kitchen and bathroom. This may have to wait until we save money for the pipes, but it is something to stir our ambition. Once we become successful SAMAKA farmers, we may be producing extra produce from our home gardens which we can sell for enough to pay for one of these pumps and the pipes. A sketch is printed here showing how a barrio farmer can have running water in his house.

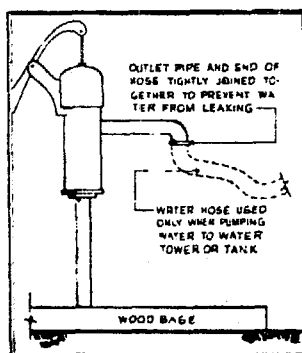
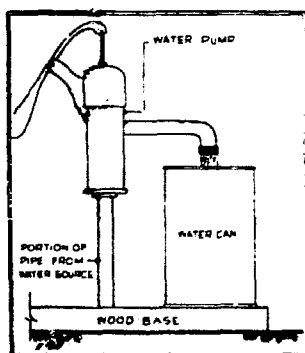


Fig. 11. A small hand pump can lift water from 6-meters deep. It can be connected by pipe or rubber hose to our water tank.

Keeping The Well Water Pure

If we cannot find a good location in our garden for a well which will prevent it from getting dirty, with disease germs, it is not good to drink this water unless we boil it first. That is what we should always do with our well water, unless it has been tested and approved by a sanitary inspector. The same thing should be done with water we get from the river.

If our well water is at first pure, and then later becomes impure because some animal or other dirty thing accidentally falls into it, we should at once purify the well. The easiest way to do this is to throw into the well about 4 tablespoons of a disinfecting medicine called *Chloride of lime*, which we can get from the sanitary inspector. This amount is enough to purify a well where the water is about 1 meter deep. After a half hour the disease germs in the water will be destroyed by the chloride of lime and the water will be safe enough to drink. It will have an unpleasant taste because of this disinfect-

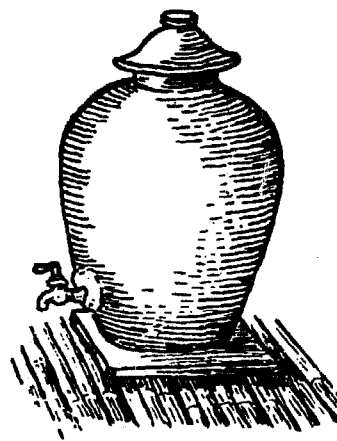
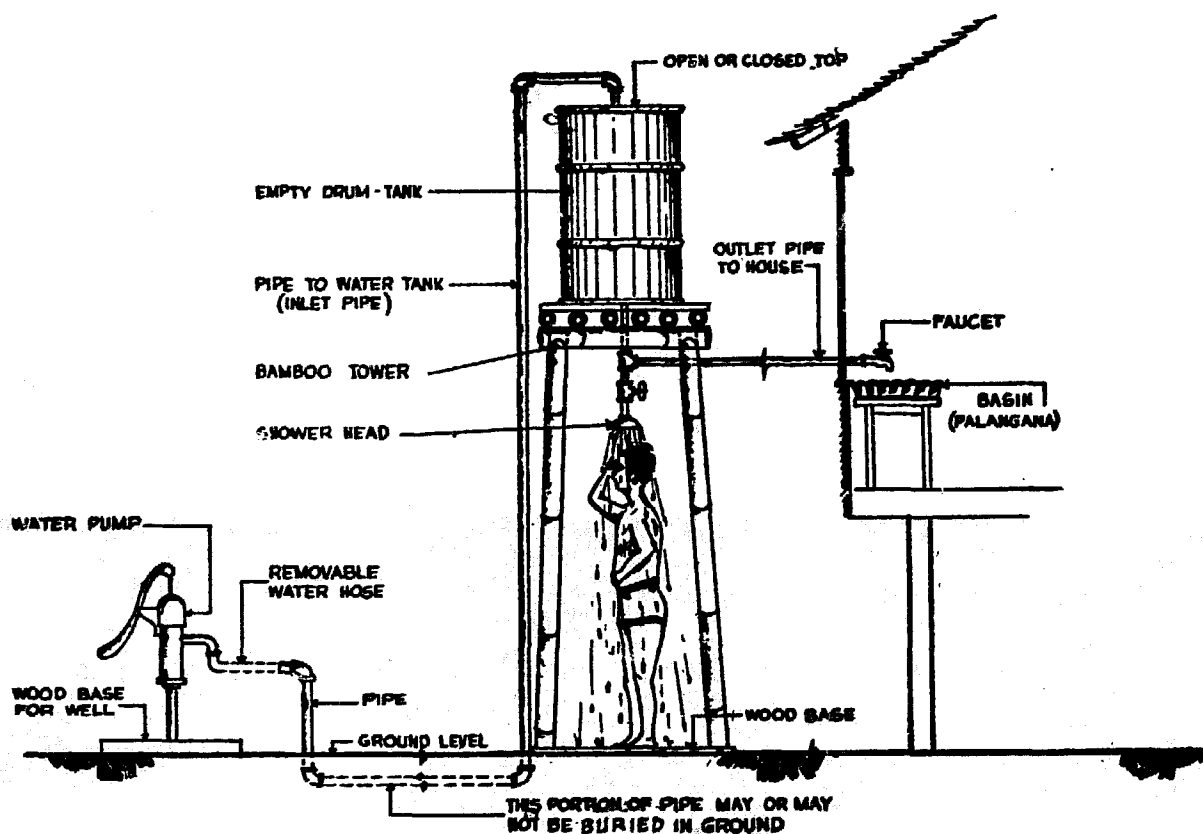


Fig. 12. A stone jar with faucet is safer for drinking water.

ting medicine. If we wish, we can pump out the water in the well which has the medicine taste, until it is replaced by fresh and pure well water.

Until we have a handy supply of pure drinking water, we should

store our boiled water, or the artesian water when there is an artesian well, in a clay jar with a faucet, so we can draw water without dipping into the jar and thus perhaps making the water impure. (Fig. 12).



Many barrio people use oil-drum for water tank and have running water for kitchen and bath.

Our Vegetable Garden

Good Practices For All Gardens

The SAMAKA farmer grows vegetables chiefly to increase his family food supply. So we want to learn how to raise a lot of vegetables with as little work as possible.

Fencing

The first thing we must do is to build a strong fence which will keep out chickens, pigs, carabaos and goats. It is useless for us to start a garden until this is done. A fence made of local materials is cheap and satisfactory. Some farmers plant for fencing the bituñgol (palutan). They say that when planted one meter apart along the fence line it keeps out animals and people because it has plenty of spines even on the trunk. It should be trimmed in front and back to make side branches grow thick. Other trees ideal for fencing purposes are the malungay and katuray. The former can be easily grown by sticking the branches into the ground. These two trees are legumes and they also produce good, wholesome vegetables. Many farm wives say that the flowers of the katuray make a good salad when scalded. The leaves and young fruits of the malungay are widely known for their food values, especially to nursing mothers. We all know that the "madre de cacao" (kakawati) and the ipil-ipil are also good materials for fences,



and the pruning of these trees gives a supply of firewood.

More and more barrio farmers are discovering that cassava (kamoteng kahoy) makes a strong fence, and at the same time produces abundant food for the family and the livestock. Fairly large cassava stems should be planted, close together, and they should be pruned occasionally at the top after they are growing well. This makes the stems stronger and thicker, so they become excellent posts for our chicken-yard or pig-yard fence. However, we find that it is better to use wood or bamboo corner posts. We can continue harvesting the cassava roots on each side of the fence for many years. Many SAMAKA farmers will like to try this kind of fence.

Getting Our Soil In Condition

Almost any soil can be made to produce plentifully. Maybe the land around our house is already fertile. Then our task is to keep it fertile. If it is very poor land, it may need some manure and maybe some commercial fertilizer. But in most cases our land will produce fair crops without commercial fertilizer. All we have to do is to put it in good order and keep it in good condition.

Two things make good soil condition. One is loose texture, easy to work. The other is plenty of plant food in the soil, the food that the roots absorb to feed the entire plant. We know that the best method of getting these two conditions into our soil is to use on our land plenty of organic material, such as animal manure and rotted leaves, grass, straw, and the like.

Tillage

One of the labor saving methods which the SAMAKA farmer can follow is not to plow or spade the ground in such a way that he turns

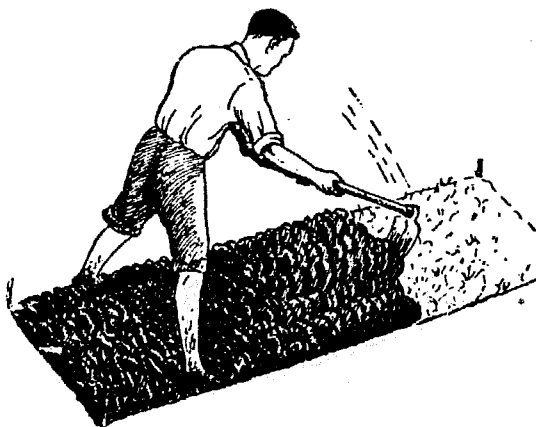


Fig. 13. Hoe is most convenient tool for preparing vegetable plots.

the top soil under. The roots get most of their food from the top soil. If the garden is started when the soil is too hard, like when we use part of a rice field, we may need a plow to break the surface.

In that case, we can use a Filipino pointed plow, and stir and break up the ground about 10 centimeters deep, or the width of the hand, but not over 15 centimeters. If the ground is not so hard, we can use a hoe to loosen the surface. (Fig. 13).

After the soil is broken this way, we should take a rake or other tool and make the clods of earth smaller, then smooth and level the surface.

If there are plenty of pieces of dead grass and weeds on top, let us leave them there. They will soon rot and make the soil richer. We should remove only living weeds and large pieces of trash, and put them in the compost pile, which we will discuss later, or feed the weeds (with earth attached) to the pigs.

The earthworm is our friend, because it loosens up the soil and lets the air in. When our garden has plenty of compost the earthworms will multiply.

After this easy preparation the garden land is in condition for planting most of the vegetables. All we need to do then is to make the planting rows according to the width required for the kinds of vegetable we are going to plant.

Weeding And Cultivating

After we have planted our vegetables a race will start between

the vegetables and the weeds. Weeding by hand is necessary until the plants get well started. After that weeding can be done with a hoe.

Cultivating around the plants is recommended by many farmers. Others advise against this, especially in the dry season, believing that loosening the top soil causes it to dry out more quickly, and often damages the roots.

For the SAMAKA gardener who wants to make his work easier, both weeding and cultivating can be reduced. Instead, we can practice mulching.

Mulching

Mulching as we speak of it here is the old custom of our ancestors of placing loose organic material, such as straw, cut grass, leaves, and the like on the surface of the ground, around the plants or between the rows. In some cases the mulch is put between the rows only. For larger plants and bushes, such as corn, tomatoes, okra, pepper, and fruit trees, we can place it directly around the plants.

What does mulching do for the home garden? Here are some of the great advantages we have learned about mulching.



Fig. 14. Straw mulch keeps earth moist.



Fig. 15. Mulching prevents growth of weeds.

1. Mulching keeps down the growth of weeds.

2. Mulching absorbs the rain and irrigation water, and prevents heavy rains from washing away our rich top soil (erosion).

3. In the dry season, mulching keeps the sun from drying the soil quickly, and saves irrigation water. Even on the hottest days, if we lift the mulch we will find the soil underneath damp.

4. In two or three months the mulch rots and becomes organic fertilizer which we can mix into our top soil.

5. Mulching reduces the work of cultivation around the growing plants.

6. Mulching cuts the labor of weeding to almost nothing.

Mulching, therefore, saves labor, produces better crops, and saves on the cost of commercial fertilizer. (Fig. 14 & 15).

Irrigation and Drainage

Many home gardens are given too much water. During the rainy season we must of course provide good drainage, by making trenches between the rows, and also ditches to take the water to some low place. If the land does not drain well during the growing seasons of the vegetable garden, it is advisable to build our planting rows

somewhat higher, so the roots will not be covered with water too long. Some plants, we know, can stand more water than others.

Even in the dry season we do not have to water our garden every day. Many of us have found that our soil is like a piece of blotting paper. If the soil is compact, the water deep in the soil will spread to the surface where the roots lie. However, if rain does not come, then the ground has to be soaked with water when it gets too dry.

Most vegetables do not have deep roots like trees. So they suffer quickly in dry periods. Many of us make the mistake of being irregular in the watering of our plants. Alternate wet and dry periods are very bad for many vegetables. Too much water is often as harmful as not enough. So we should try our best to maintain a uniform moisture supply during the growing season.

When the plants are young seedlings, the top 5 centimeters should be kept moist. Later on, the top 5 centimeters can be dry, but the lower 25 centimeters should be kept moist.

There are two methods of watering our garden. One is with a

hose or a can where we sprinkle or pour the water on top of the plants and around them. The other is by putting water into irrigation furrows or ditches between the rows. Most of us find the irrigation ditch is the better way.

When we throw water on top it causes the loose soil we have prepared to cake and become hard. Sometimes when we see the top of the ground wet we may think we have placed enough water, but later discover that there was not enough to reach down to the roots. Also many plants are harmed when water is sprinkled on their leaves.

The ditch irrigation makes it certain that the water will reach the roots. Not only will it reach the roots this way. Some of it will go below the roots and keep the subsoil moist, which also helps keep the upper soil from drying out. The illustration shows how the water from our irrigation ditch feeds the roots, without packing the dry mulch or loose soil on top. (Fig. 16). This way we save water and do not have to cultivate the ground around the plants after watering.

When we lay out our ditch irrigation system for our vegetables we should keep the furrows level, so the water will not run off quickly before it has soaked into the ground. We can make check dams with a board or spade to hold the water long enough to reach the roots. (Fig. 17).

If we have to bring the water from some place away from our

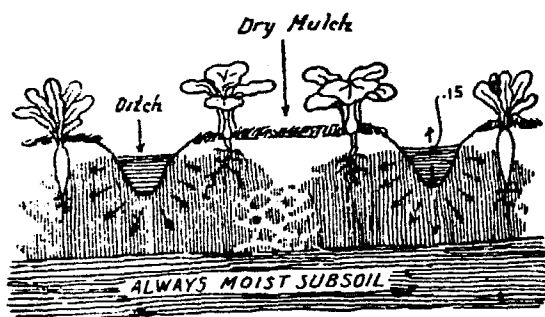


Fig. 16. Ditch irrigation waters plant roots.

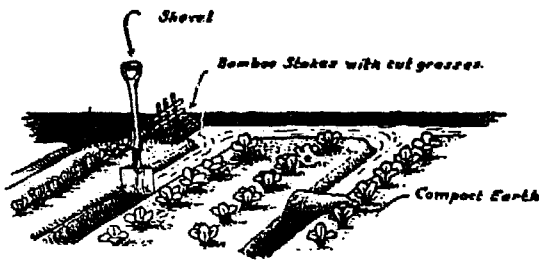


Fig. 17. Showing 3 ways of ditch irrigation.

house, it will save much time and labor to make a water cart, to bring the water to our garden. A handcart will do the work satisfactorily, but a carabao cart is easier when we can spare the carabao for this work.

A simple way to bring water from the well to our garden plots is to use bamboo tubes or pipes. (Fig. 18).

Every good farmer frequently investigates the condition of the soil under the surface. We dig down to the depth of the plant roots with a spade or hoe, to see with our own eyes whether the soil is too wet or too dry.

When we have to water the plants, the best time to do it is late in the afternoon after the sun is low.

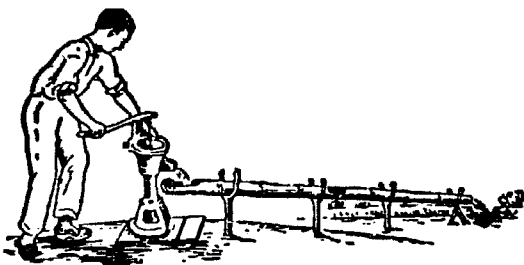


Fig. 18. A bamboo water pipe saves labor.

Crop Rotation

To make our SAMAKA garden give the maximum yield, and abundant food for our family, we want

to keep it busy all the time. As soon as one crop is harvested, we should plant another, according to its season.

Some crops do not have to be planted every year. Plants of this habit are called "perennials." They continue producing year after year. But even these perennials should be replaced or transplanted after a while in another part of the garden, to give them new vigor from a change in soil. This practice is called "crop rotation." Each kind of plant takes away something from the soil, but also it gives something back. By rotating these permanent or perennial crops from one part of the garden to another, we can give the land a rest from one kind of plant and the soil gets richer from the other plant we put in its place.

With our annual crops—the plants we have to plant anew each season—it is also good to practice crop rotation. We should not plant our beans, our corn, our tomatoes each in the same place every season. By exchanging places each season, our land will remain fertile longer and our crops will be more robust.

This is especially true with those plants which are called "legumes," such as the beans, batao, soybean, cowpea, peanut, patani, and mungo. The roots of these plants take a gas from the air, a gas we cannot see or taste, and add it to the soil. This invisible gas is called nitrogen. It is the same substance which is plentiful in guano and many commercial fertilizers we must pay for. By "hiring" our

beans and other legumes to manufacture our "nitrogen fertilizer" we keep our land rich, and it does not cost us money. In addition, we will enjoy the fruits of these legumes. The word "legumes" is therefore a word that every SAMAKA farmer is beginning to learn and remember.

It has long been known by farmers that it is good to give the land a year's rest every few years, so it can grow strong again. But when we do not have enough land, we cannot give it a year's rest, because we cannot stop eating for a year!

Crop rotation enables us to "rest" our land without keeping it idle. Changing the use of the land wisely is another form of rest. Many times we come in tired from a hard day of work in the fields. We find our companions playing basketball or dancing, or maybe boxing. We forget that we are tired and eagerly join the sport, feeling "rested" by the change in activity.

When To Plant

In order to keep our land busy growing different vegetables for our family every month of the year, we must plan ahead of time when we will plant each crop. Most of our garden vegetables have definite planting seasons. Later, when we describe each of the important vegetables, we will recommend the best time to plant it.

We have already learned when to plant many things by experience and observation. But it has been the custom in many barrios for all

of us to plant the same crop at about the same time. We usually plant our field corn or our camotes, or our peanuts, or other crop, after we have harvested our major crop. That limits the planting time, because our fields are busy raising another crop.

Succession Planting

Yet we now know that nearly all of the garden vegetables can be planted equally well over a period of two or three months or more. So in our home garden we do not have to follow the custom for our field crops. The SAMAKA farmer should make use of this lengthy planting period, by planting a few of each vegetable every two or three weeks. By doing this, the harvest does not come all at once, but over a long period. We can try different planting times in our home garden, and that way we learn how to extend the planting season in our own barrio.

This is called "succession planting," and has many advantages, especially for vegetables which do not keep well after they are gathered. Let us get away from the custom of planting all of our okra, for example, the same week. If we do this, we find ourselves with so much okra getting ripe at the same time that we cannot eat it all and two weeks later we will have no more tender okra in our garden for another six months.

The SAMAKA way is to plant one row of okra this week, another row 3 weeks later, and so on until we have planted four or more rows. We will then have a family

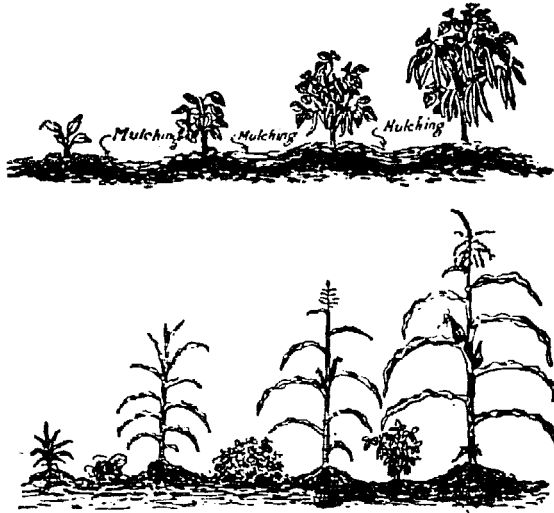


Fig. 19. Succession planting gives us fresh vegetables for many months.

supply of okra for three or four months in succession. We know a farmer near Manila with only a small garden who has fresh corn during 9 months of the year by using "succession planting."

Another advantage of succession planting is that if one planting is destroyed, we do not necessarily lose everything. The other rows may be saved. (Fig. 19).

There are not many home garden crops planted in Central Luzon between July and October. If any land is unplanted during the heavy rainy season, it is better to plant cowpeas than to allow the wild grass and weeds to grow over the land. This furnishes a good vegetable from the tender shoots and fruits and green feed for our pigs, and it also protects the soil. When we are ready to plant food crops again it is easy to chop up the cow peas and mix the vines and leaves into the top soil or put them in the compost pile.

What To Plant

We will select the vegetables we plant because we like the taste. As SAMAKA farmers we should also think about other reasons. We should think of the food value to our family, because some vegetables are richer food than others. We should select crops that are easy to grow on our kind of soil, or that add richness to our land. Vegetables that are strong and resist insects and diseases are to be preferred. As SAMAKA farmers, we also want to grow things which we can feed to our pigs, chickens, and other livestock.

When we think about these different reasons, we will be able to make a wise decision.

The SAMAKA way of farming is called *intensive* and *diversified* farming. "Intensive" farming means that we are using every bit of our garden as many months of the year as things will grow. By using our family labor all the time, we are getting the maximum production for every square meter of land.

"Diversified" farming means we are growing many different kinds of vegetable and fruits, and raising poultry, pigs, and other livestock, so that we have to buy very little food from the store.

How To Plant

For each of the various vegetables we decide to plant, there are

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certain things the SAMAKA farmer must know. Being farmers, we already know many of these things. In another part of this book there are brief suggestions as to the best practices for each of the principal garden crops which successful barrio farmers have told us. For more detailed information on any crop we have not tried, the Agricultural Extension Man can give us a special paper about it, or tell us personally what to do.

There are a few basic principles we SAMAKA farmers should always remember about planting.

First, we should not transplant unless it is necessary. Many garden books tell us to plant seeds in a seedbox first, then thin them out into another seedbox or seedbed, and finally plant in the ground. That is a lot of work, and takes too much time for the busy SAMAKA farmer who merely wants to raise more food for his family.

Seedbox Recommended

The vegetables for which most farmers find it better to plant first in a seedbox are the following:

- | | |
|----------------|----------------|
| 1. Anise | 7. Mustard |
| 2. Beets | 8. Onion (big) |
| 3. Cabbage | 9. Pechay |
| 4. Cauliflower | 10. Pepper |
| 5. Eggplant | 11. Spinach |
| 6. Lettuce | 12. Tomatoes |

How To Prepare A Seedbox

For garden plants needing a seedbox, a flat box that can be placed above the ground is recommended. We should have at least one seedbox made of wood, about $7\frac{1}{2}$ centimeters high, 30 centime-

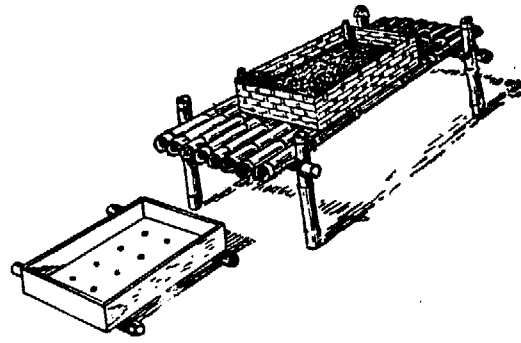


Fig. 20. Seedbox can be of wood or bamboo.

ters wide, and 45 centimeters long. This is big enough for most of our garden seeds, and small enough to carry easily. The bottom should have cracks between the boards to allow drainage, or holes should be punched in the bottom. (Fig. 20).

The soil in the seedbox does not need fertilizer, because the plants do not remain there long enough. The best soil for the seedbox is 1 part loam soil, 1 part rotted compost, and 1 part sand. We mix it well and sift it through a screen to keep out large pieces of material. On the bottom of the seedbox we place pieces of broken pots or some gravel, to cover the cracks and holes, without stopping the drainage. Next we place a layer of moss or straw to keep the soil from washing through. Then we pour on top of the moss or straw our mixture of seedbox soil up to $1\frac{1}{2}$ centimeters from the top of the box, and press it down with a board.

On top of the firm soil we spread loosely a thin layer of finer soil to a depth of $\frac{1}{2}$ centimeter. (Fig. 21).

If we want to plant only a few seeds of a certain kind, we can use a flower pot or even a shallow can,

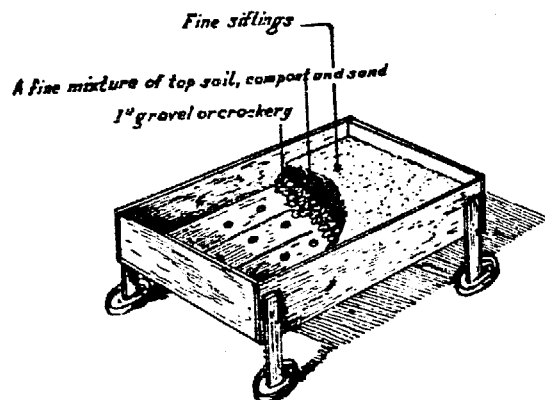


Fig. 21 Prepare soil for seedbox carefully.

preparing it the same way as a seedbox.

Planting In The Seedbox

Before we plant seed in the seedbox we moisten the soil, either with a fine spray, or better still by letting the seedbox stand half its depth in a pool of water until the soil absorbs enough moisture.

When we sow the seeds we can make even rows with a thin board, such as a piece of cigar box, or with a pointed stick. These rows should be twice as deep as the size of the seeds. Then we cover the seeds with fine loose soil and press it gently.

The seedbox should be kept in a shady place, especially until the seeds have sprouted. In the dry season we can cover the box with a sheet of paper to keep it from drying out too fast. If the seeds are the kind which ants like to steal, we can have supports or legs for the seedbox, set in cans of water (Fig. 22).

Thinning

If the right amount or quantity of seeds is sown evenly, there should not be any need of thinning

the seedlings, but often we farmers sow more seeds than what is necessary. To produce strong plants it is better to pull some of the crowded seedlings, so that the remaining plants will have more room. Before doing this, another seedbox should be made ready for the pulled seedlings. Before pulling the seedlings the seedbox should first be watered to loosen the soil. We should do the thinning with the aid of a small pointed stick about the size of a pen or pencil to help in lifting the plants from the soil without breaking the roots. (Fig. 23). The seedling pulled out should be planted into the previously prepared extra seedbox and watered gently.

Transplanting

Seedlings ready for transplanting should be big enough to withstand handling. We must not forget to water the seedbox before the seedlings are pulled out, so that the soil will be loose and the seedling will not suffer from many broken roots. In pulling, a small stick should be used so as to include enough earth to go with the roots. A garden trowel or a small

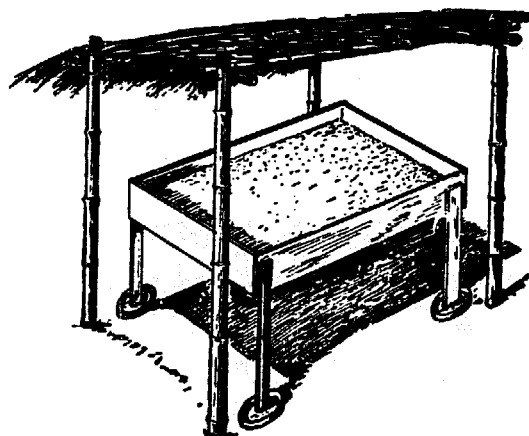
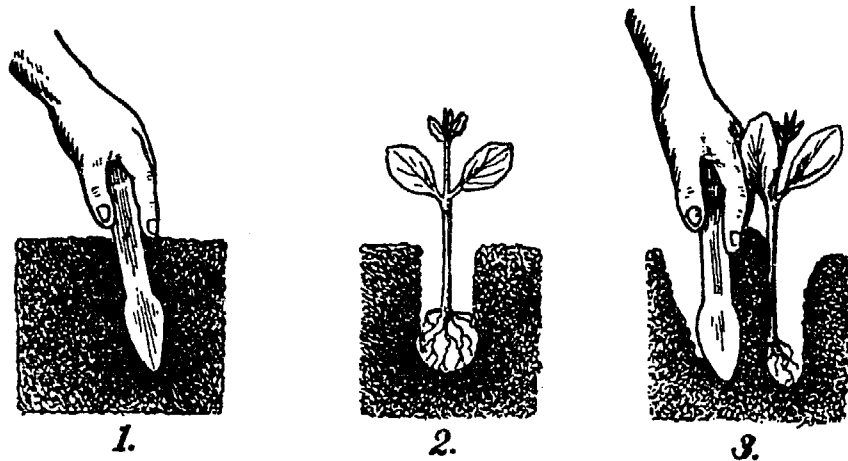


Fig. 22. Seedbox should be protected from sun and ants.

Fig. 23. With pointed stick (1) make hole, (2) transfer seedling to hole, (3) press soil around roots from sides.



bolo or a thin stick is a handy tool in lifting seedlings from the box. A good container for transferring seedlings is a shallow small basket or a banana leaf sheath of convenient length. With the aid of the small bolo, trowel or stick a shallow hole is dug in the soil and the seedling carefully placed into the hole at the same depth it was in the seedbox, without disturbing the ball of earth around the roots. The plant is held in hand to stand erect and the hole is covered until a mound of earth is formed around the stem. The soil should be lightly pressed down with the hand, but carefully so as not to break the roots. (Fig. 24).

The newly set seedling should immediately be watered. The wa-

ter will press the soil gently around the roots and a depression will be formed around the stem. This depression should be filled or covered loosely with dry earth to help brace the stem and to prevent rapid evaporation and baking of the wet soil around the plant. Transplanting should be done in rows at convenient distances depending upon the kind of plants to be grown as will be shown later.

Cooperative Seedboxes

In our home gardens we want to plant vegetable seeds frequently, so as to harvest them for many months for our use. It is a lot of trouble to plant small quantities of one kind of seed every two or three weeks. In some barrios the farmers get together, and each is assigned the task of planting a certain kind of seed in his seedbox, distributing the seedling for transplanting by the neighbors in their own gardens. This is a good SAMAKA practice.

One packet of seed is usually much more than we can use for a home garden. If we get seeds from the government it will be easier to get enough for all of us as a

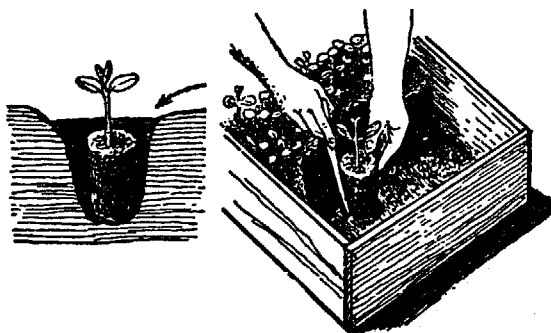


Fig. 24. We must not disturb soil around roots of seedlings when transplanting.

group, than to get one packet of each kind for each home garden. The leader can select one farmer to plant the seedboxes of lettuce for everyone, another to plant the seedboxes of tomatoes, and so forth, for all of the seedbox vegetables. Two or three weeks later the farmer assigned plants another seedbox with the same vegetable, so that succession planting will be easier to carry out.

Selecting Our Seeds

The value of the seed we use is a very small part of the cost of what we harvest. In order that we may be well rewarded for the labor and care we give our garden, we should always use the best seed we can find. The Agricultural Extension Man can supply us with selected seeds for most of the native vegetables and some of the imported seeds. Many kinds of seeds are furnished free for home gardens. Others we will have to pay for. We will, of course, save the best seeds we can select from our

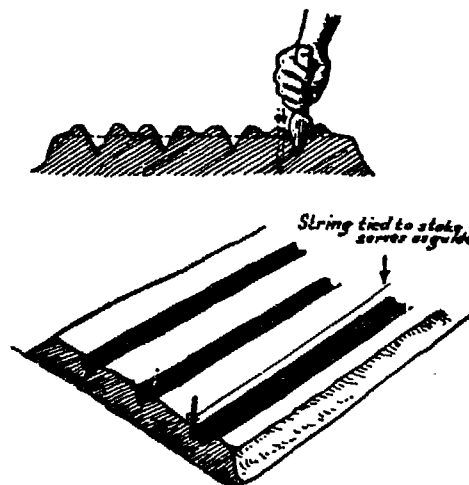


Fig. 26. Drill planting of seed using pointed stick to make furrows.

own garden, instead of getting them from others. If we adopt the cooperative seedbox system the farmer planting the seedbox of each kind should have the right to select the seeds he needs from all who participate.

If we plant from cuttings or roots, we should select our planting material only from strong healthy mother plants which show a good yield in quality and quantity.

Cultivation

By cultivation we mean the task of keeping the soil around our plants free from weeds, and in a loose and easily crumbled condition. In the SAMAKA garden a hoe is the best tool for this, but a rake-hoe is also good (Fig. 25). A home made rake-hoe with pointed bamboo sticks can be made by any SAMAKA farmer.

Cultivation should never be deep enough to touch the roots. Only shallow cultivation should be given to beans, tomatoes and corn.

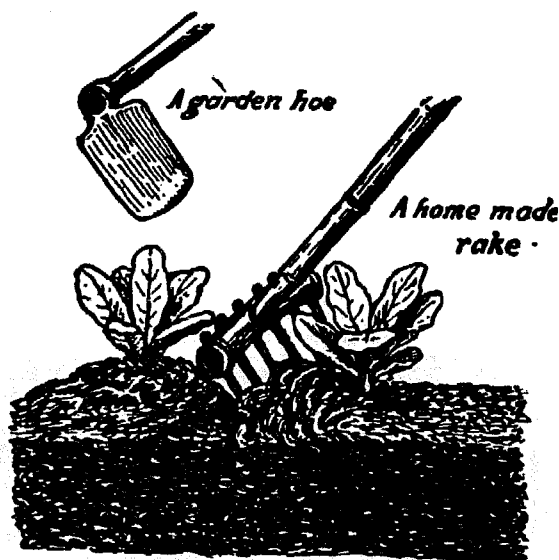


Fig. 25. If we lack an iron hoe we can make a bamboo rake for cultivating.

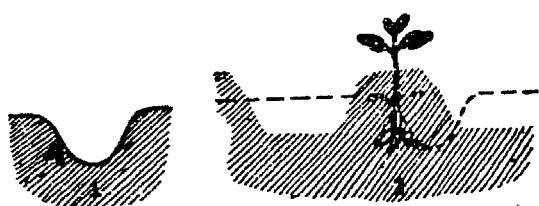


Fig. 27. Furrow planting (1) seeds on side of furrow; (2) as plant grows earth is added.

Methods Of Planting In Garden

Different methods of preparing our garden plots are followed. We learn from experience which is the best preparation according to the soil and climate in our own barrio, and for the different kinds of plants.

Drill planting. A "drill" is a very small furrow made for planting seed in a row. It can be made with a pointed stick or the corner of the hoe, and is cut slightly deeper than the size of the seed. (Fig. 26).

Furrow planting. A furrow or ditch the shape of a V is made for deep planting, and also for irrigating the roots of the plants. Furrow planting is common for corn, melons, and squash. The seed is planted on the side of the furrow, and as the plant grows, the soil from the other side of the furrow is drawn with a hoe around the plant, hilling the plant and moving the furrow away. (Fig. 27).

Hill planting. This is the com-



Fig. 28. Hill planting and row planting.

mon practice of having 3 or 4 plants, growing in a small circle, 30 to 45 centimeters in diameter. Usually double the quantity of seeds are planted in hills, evenly spaced, and after the plants are up, all except the strongest are removed. (Fig. 28).

Interplanting. One way to get the most production and a large variety of vegetables in our small lot is to plant quick-growing varieties between slow growing varieties. Also we can plant one variety between rows which are soon to be harvested. For instance, cabbage can be planted between rows of corn a month before the corn will be ripe. (Fig. 29).

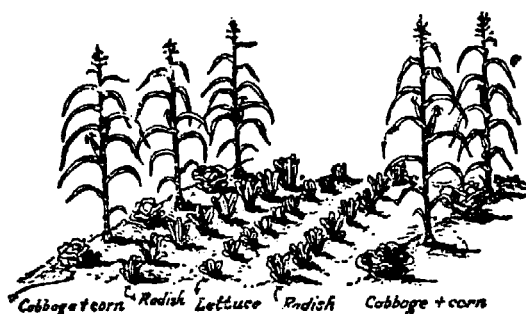


Fig. 29. Interplanting increases useful garden area.

Planting Distances

In the planting directions for each vegetable we will find suggestions as to the correct distances between plants and between rows of plants. We do not have to follow these suggestions exactly, because different farmers follow different practices. Many experts tell us we should plant corn in rows 1 meter apart. That may be good for our large field, because we need space for the cultivator drawn by the carabao to pass be-

tween the rows. But in our home garden we can plant our corn closer than this, because we cultivate it by hand, and also because we can afford to put more manure in our garden than we can put in large fields. We will usually follow what our own experience teaches about the best planting distances, so that we can use our small homesite for as many plants as possible. The extra care we can give our garden vegetables makes this possible.

Plant Pests And Diseases

Every SAMAKA farmer has to be a soldier part of the time, fighting the enemies of his garden. Insects, worms, and diseases are the principal enemies.

Now here is the surprising thing many farmers have observed about plant diseases. If we have rich fertile soil, with plenty of rotted leaves, grass, and straw mixed in it, which provide the right natural chemicals, and if we have used selected strong seeds, and take good care of our garden, *our plants do not often get sick*. It is like the child, whose father and mother were strong, and who gets plenty of good food, and lives in a clean house. He does not get sick like other children. His body resists so many diseases, even when the other children have them. We have seen this happen many times. We must remember that plants also resist disease when well fed and cared for.

There are different medicines or ammunition to use against these different enemies of our gardens.

Many of them can be best applied as spray or dust. So every SAMAKA farmer should have a sprayer to use when insects, worms, and diseases attack his plants. If one of us cannot afford to buy a sprayer alone, let the SAMAKA spirit bring several neighbors together to buy one for each to use in turn.

One of the new pests which is attacking our gardens in some places is the Giant African Snail, also called the Japanese Snail because the Japanese Army brought these snails to the Philippines as food for their soldiers. We can use poison bait to kill these snails, but sometimes our poultry may eat this poison. The best method for controlling this pest in the home garden is to have the children go in the garden each night and gather them in a can. We can then pour cold water in the can and heat the water until the snails come out of their shells. Then we destroy them by pounding and use them for feed for the pigs and chickens, or use them for fertilizer.

We are not "doctors" of plant diseases and pests, so we cannot know what to do to fight many of the enemies. Whenever we see a disease or pest attacking our plants which we do not know about, we can send for the "plant doctor," the Agricultural Extension Man. He can usually tell us what to do, what kind of medicine to use, and where we can get it. If he does not know, he can get the help of the many "specialists" of the government who can tell him, so he in turn can tell us.

But most important for us to remember is what we said before: *Healthy plants* in fertile soil do not often get sick.

Planting Directions

Each one of the vegetables we plant has a different custom. For many of them we have learned when to plant, how to care for the vegetable, how far apart it should be planted, and when to harvest it.

Now that we are about to start our SAMAKA garden, we will want to have many other kinds of vegetables we have not tried before. To help us succeed in trying new kinds of vegetables we are now going to put down on paper simple planting directions for many vegetables suitable for the home garden.

Kitchen Preparation

In many of the instructions on vegetables, there is a paragraph on kitchen preparation. Most farmers' wives already know many good ways of preparing vegetables. This is included for those who try for the first time one of the vegetables we tell about.

There is one important thing we are learning from the best cooks, however, and that is, we should not boil our vegetables in too much water and also we should not cook vegetables for too long a time. The farmers' wives have learned long ago that if we boil our vegetables too long, and use too much water, the flavor is not so rich.

Now the doctors tell us another reason. They have found that excess water and overcooking take from the vegetables many valuable substances which our body needs. When we throw away the vegetable cooking water we are often throwing away the most valuable part of the vegetable.

One barrio farmer's wife who is famous for her simple but delicious cooking, tells us this:

"With fresh vegetables, I use just enough water to make plenty of steam, and let the steam cook the vegetables.

"As soon as the vegetables are tender, but not too soft, I take the pot from the fire.

"I use the water left in the pot to mix with soups."



What We Should Know About Fertilizers

Our Compost Pile

Compost is rotted organic material, such as leaves, straw, cogon, grass, weeds, rice hulls, corn stalks, vines, and animal manure. When this material is fully rotted it is called *organic fertilizer*.

We have all noticed how this kind of material gets rotten when it becomes wet. It is the same way the leaves rot when they fall to the ground and become a part of the soil.

Compost will not cost us anything except work and is the most plentiful fertilizer. Even the weeds and the cogon become useful fertilizer when they rot and break up into small particles.

The old method of making compost fertilizer is to pile all our

wastes on the ground until the pile is 30 centimeters (1 foot) high, then add a layer of animal manure. Pig, chicken, carabao, horse and goat manure are all rich fertilizers. On top of this manure, we sprinkle some ashes and lime. Then we add another layer of plant wastes, with more manure, and in this way continue building up alternate layers until the pile gets about 1½ meters (5 feet) high, the same in width and length.

We keep our compost pile moist, but not wet or flooded with water. Most farmers cover their compost with a grass or banana leaf roof in the rainy season so it will not get too wet.

In about 3 months the compost

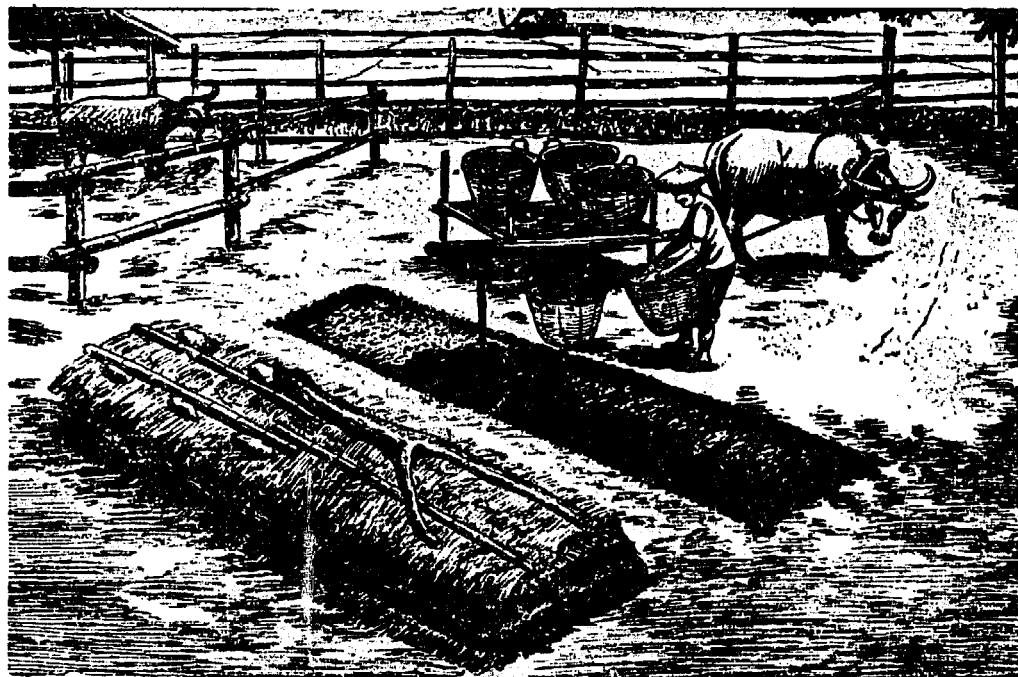


Fig. 30. Rice straw, leaves, trash, manure, garbage, and weeds are stored in compost piles for spreading on our fields as home made fertilizer.

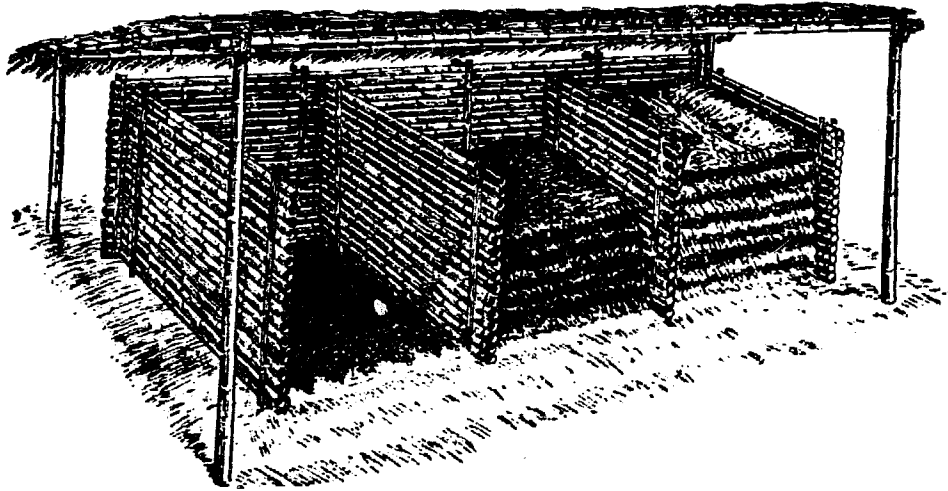


Fig. 31. To protect our manure compost pile from too much rain, a grass roof is needed. Making 3 compartments permits us to keep adding to our compost pile. Compartment at left is ready for the fields. The others are still rotting.

pile will shrink to about one-tenth of its original size and will be changed into rich organic fertilizer which can be spaded or plowed into our garden planting beds or fields.

New Composting Methods

But now we have a better way to change compost into rich fertilizer.

Instead of waiting 3 months, we can make our compost into organic fertilizer in 3 weeks. And it will be better fertilizer!

The secrets of this quick process are as follows:

1. Have plenty of animal manure and household garbage mixed with the leaves and straw, to add more nitrogen to the mixture. Most of these garden and plant wastes are wood-like or fibre-like substances (carbon) which need nitrogen to help them rot and break into small pieces. The scientists call this the "Carbon Nitrogen Ratio." It has been found that the best compost mix-

ture is 30 parts of carbon to 1 part of nitrogen (C/N 30.).

When we have the correct mixture we should chop it into small pieces, 3 to 5 centimeters long, to speed the rotting process. In our small farm we have no way to be sure of getting the right proportions of carbon and nitrogen except by trying different combinations and observing results. It is better to have too much manure than not enough.

If we lack sufficient animal manure and garbage, we should add artificial or commercial fertilizer containing nitrogen to the **compost**. This has three advantages: It will help the compost change quickly to organic fertilizer. It will make the artificial fertilizer we use easier for the plants to take up and digest. And it will prevent the nitrogen from evaporating or being washed away by the rain.

2. The second secret is to turn the compost pile every few days.

We find that if the right compost mixture is used, the pile will get very hot in the center. If we let it stay too hot, it begins to have a bad smell, and the pile becomes dry. So we push a bamboo stick into the center and after 3 minutes, we pull it out. If the stick is quite hot, it means we should turn the pile. If the stick smells bad, we should turn the pile. If the stick is dry, we should turn the pile.

3. Finally, we must keep the compost pile moist, but not wet—something like a wet rag out of which we have squeezed the water. The hot temperature in the compost pile causes much of the water to evaporate as steam. So every time we turn the pile, we should sprinkle enough water on it to keep it moist.

If we turn the pile frequently and keep it moist, it will always smell sweet. If it smells bad, it is because we did not turn it soon enough. The bad smell is the smell of nitrogen escaping into the air, so we are losing some of the fertilizer.

In turning the compost pile, we first gather the material from the outside of the old pile and place it in the center of the new pile. Being dry, it will need more water. We then take the material from the inside of the old pile and place it on the top and sides of the new pile.

In this way, everytime we turn the pile, the mixture alternates its position from inside to outside and outside to inside.

The successful compost pile, we

now learn, needs three things:

(a) A good mixture of materials broken up into small pieces, with plenty of manure or nitrogen;

(b) Plenty of air;

(c) The right amount of water.

If we have pigs, it is important to let the floor of the pig pen drain into a hole where we keep compost, so that the urine of the pigs will be added to our organic fertilizer. When we clean the floor of the pig pen the cleaning wastes can also be added to the compost in the drain hole. From time to time we transfer this material to our main compost pile and put more straw and leaves into the hole.

Artificial Fertilizers for the Home Garden

For thousands of years people have used animal manure, ash and rotted plant wastes to restore fertility to the soil.

When a plant grows it takes certain substances from the earth in order to grow. These substances are food for the plant. They are just as necessary for plant growth as rice, fish, meat and vegetables are to the growth of our children. When our rice sack is empty, we must replace the rice we have consumed or else we will be hungry later. Likewise, we must return to the earth the substances we have taken away from our garden or field when we harvest our crop.

Some kinds of plants take more food from the soil than others. When we take away from the field a sack of palay, and leave behind the straw and roots, we are taking

away only a part of the plant food taken by the plants from the soil. But if we harvest a crop of cabbage, or lettuce, or sugar cane, and take it away from the field, we are taking away nearly all of the plant food consumed by the plants.

About one hundred years ago, the scientists began to study what exactly was in the soil that gave food to the plants. Today we know that three major elements make up most of the soil fertility or plant food in the earth. These three elements are:

- Nitrogen
- Phosphorous
- Potassium

Secondary and minor elements in addition to these three, which are needed in small amounts but which must be present in the soil to make plants healthy are: calcium, magnesium, sulfur, boron, iron, manganese, copper, zinc, molybdenum and cobalt.

In fertile soils all of these elements are present in abundance so crops grow well and harvests are big. Plants can get from the earth all the food they need. Poor soils do not have enough of some of these plant foods so the plants are not so healthy and harvests are small.

Fortunately, the scientists found out that these substances could be made in factories and put back into the soil, to supply what is lacking or replace what is taken from the soil by the harvested crops. In this way we can increase or renew the *fertility* of our garden or field, or *make fertile* a garden or field that before was poor in plant food.

Everyone Uses Fertilizers

Today, farmers all over the world are using these manufactured substances, called *commercial fertilizers* or *artificial fertilizers*, in order to increase the yields of their gardens and fields. It has been found that for every peso we spend for buying the fertilizers which are needed, we gain three to ten pesos in *increased value* of our crops. It is often said that "fertilizers pay, they do not cost."

For many years the Philippines have had to buy from other countries the commercial fertilizer we needed and the price was high. Only the prosperous sugar planters could afford to use enough of this artificial fertilizer.

But now we have two factories making commercial fertilizers for the use of our farmers and gardeners.

First, the National Power Corporation started to make nitrogen fertilizer, combined with sulfur. This is called ammonium sulphate, and contains 20.5% nitrogen and 24% sulfur. This factory has now been sold to a private company.

In the year 1958 the Atlas Fertilizer Corporation was organized to manufacture fertilizer, using locally produced sulphuric acid, phosphoric acid and superphosphates, to which are added other ingredients, some of which have to be imported until they can be made locally. The Atlas fertilizers are of several kinds, so that each farmer can get the kind of fertilizer he needs for his crop.

Also a number of companies now make powdered limestone which

can be added to the fields when needed.

What Kind of Fertilizer?

Which kind of fertilizer we will use depends on two things:

First, what kind of crop are we planting?

Second, what does our soil lack to make this crop grow well?

In our small home garden, we cannot afford to have our soil analyzed by an expert. So instead we have learned from experience how to detect in a practical way what our garden needs.

When the *nitrogen* in the soil is *not enough*, the plant:

1. Has light green or yellowish leaves.
2. Does not grow big and it grows slowly.
3. Has stalk which is thin and stiff.
4. Has leaves which form a small angle with the stem.

If *phosphorous* is *not enough*:

1. The plant is thin and short.
2. Beans have dark green or bluish color, resembling the leaves of plants during a long dry season or drought.
3. The stems and leaves of corn and some vegetables become purple in color.
4. The grains are thin and light in weight.

When *potassium* is *not enough*:

1. The leaves die along the edges. In bean leaves, gray spotted crescents form on the edge of the leaves.
2. The stems are weak and brittle.
3. Growth is slow.

4. Grains are thin and light in weight.

We also know that leafy vegetables, such as lettuce, cabbage, mustard, pechay, and talinum eat more nitrogen than phosphorous or potassium. We should therefore use a *complete fertilizer*—one containing all the three major elements—before planting. The fertilizer is mixed very well with the soil. After two weeks if the leaves of the plants are not dark green in color, we apply fertilizer containing only nitrogen to the soil.

Plants which have nourishing fruits and seeds, such as corn, mongo, tomato, patani, sitao, peanuts and string beans, or where we gather the fruits or tubers, such as cucumbers, papayas, bananas, pineapples, peppers, squash, camotes, ubi and the like, need phosphorous and potassium just as they need nitrogen. A complete fertilizer containing the three major elements in about equal amounts is usually put into the soil before planting.

The appearance of the plant will tell us when there is a serious lack of some fertilizer element. We examine not only our garden crops, but even the weeds, to detect soil shortages or what scientists call deficiencies. When in doubt as to what fertilizer element is lacking, the best thing to do is to use a complete fertilizer.

Lime For Acid Soil

It is not only food which plants need. The food must be seasoned, and it needs water.

When people put salt or sugar

or pepper on their food, it makes the juices of the mouth and the stomach come out more abundantly. Without these juices, the food we take into our stomach cannot nourish us.

If the soil in our garden is too sour, too acidic, the food we give our plants, such as nitrogen, phosphorous and potassium cannot all be "digested" by the plant. In such cases, we must add "seasoning" by mixing fine powdered lime into the soil at least two weeks before planting. This will help the plant in absorbing and "digesting" the fertilizer we put in the soil.

Finally, we need water to dissolve the fertilizer and the lime, so the roots can take up these elements.

For our home garden we often use fertilizers because we may lack animal manures. But we must always remember that artificial fertilizers are a *supplement* to organic fertilizers, and that the more organic material we mix with our artificial fertilizers, the better it will be for our plants and for the continued fertility of the soil.

Fertilizer For Field Crops

Our experience with compost and artificial fertilizers in our homesite garden will teach us many lessons which we can use in our field crops. Especially if we are growing corn, onions, melons, tomatoes, mongo, sugarcane, peanuts, cabbages, pechay, cassava, sitao, pineapples, camotes, squash, and other field crops on a commercial scale, we will find that the

use of fertilizers pays big rewards. When we can *double* the yield on the same piece of land with the same amount of cultivation, we know that fertilizer brings big profits.

Artificial fertilizers cost money. And a large percentage of the artificial fertilizers we place in our fields may be washed away by the rain and evaporated into the air.

But if we mix our artificial fertilizer with our plant wastes, even with cogon grass, it will become *enriched compost*, enriched organic fertilizer, which is not easily washed away by the rain and does not evaporate. Some successful farmers say that one sack of commercial fertilizer mixed into compost and applied to the fields is better than three sacks of commercial fertilizer applied alone to the fields.

Organic Fertilizer Essential

Organic fertilizer, to add humus to our soil, is necessary to profitable farming and to a successful home garden. Artificial fertilizer is a *valuable supplement* which we should be sure to buy when we lack sufficient organic fertilizer.

And we must remember this: to save money on the price of artificial fertilizer, mix it with the compost first, and make it into *enriched organic fertilizer*—this will benefit both the crops and our pocketbooks.

As we search for more materials for our compost piles, we are discovering many neglected sources. Waterlilies and water hyacinth make good compost. If we live

near the sea, we should always gather the sea weeds which at times are thrown on the beach, and add them to our compost pile.

We must also gather all the animal manure we can find, including the urine, and add it to our compost pile. The poultry manure from 250 chickens in one year is all the fertilizer we need for one hectare of corn land.

Our ancestors learned about the value of using compost. They observed the rich harvests they gathered when they first cleared a virgin forest. The *caiñgin* which they cleared had a deep rich top soil made up of rotted leaves and grasses, mixed with the manure of wild birds and animals accumulated through the centuries. As

our forefathers settled in these cleared lands and cultivated them year after year, they noticed that the land was slowly losing its fertility. Seeing this, they began imitating the natural forest, by restoring to their fields all the leaves, grass, weeds, and manure they could find, and in this way they kept their lands fertile.

Some of us have forgotten the lessons which our ancestors learned a thousand years ago. We will be wise if we return to the old custom, and practice mulching and applying compost to our fields, thus returning to the soil all of the waste plant and animal materials which accumulate in our neighborhood, instead of burning them or throwing them away.

Planting Calendar

What And When To Plant

The Planting Calendar on these pages is for those parts of the Philippines having the same kind of climate as Central Luzon.

It is the kind of climate which the Weather Bureau calls the Type I climate. This means places where there are two distinct seasons, a dry season from December to June, when there are only light rains, and a wet season, from June to December, when the rains are very heavy and very frequent.

This kind of climate is what we find in Abra, Bataan, Bulacan, Cavite, Ilocos Norte, Ilocos Sur, La Union, Nueva Ecija, Pampanga, Pangasinan, Rizal and Tarlac provinces, and in the western parts of Batangas, Nueva Vizcaya, Laguna and Mountain Provinces. We also encounter this Type I climate in the southwest part of Mindoro, Iloilo, and Negros Occidental.

However, there are sometimes local differences of climate, so that

our barrio may not have exactly the same kind of weather as most towns in our province. So when we try to follow this calendar we may find that the planting times recommended are not the best times for our town. However, since this calendar is only for our home garden, we do not lose much by trying different planting times, and we gain experience.

The Planting Calendar indicates the customary times for planting which most farmers follow, and also additional months when only a few farmers plant the various vegetables. Any SAMAKA farmer who gets bad results by following this calendar should tell the Agricultural Extension Man about it. In this way, we can correct the calendar, or discover whether the barrio where the calendar was not satisfactory had unusual weather that year or a local variation in its regular climate.

A Central Luzon Planting Calendar



(on next page)

For the Central Luzon type of climate, according to the custom of one or more of the following provinces:

Bataan
Batangas
Bulacan

Tarlac
Ilocos Norte
Ilocos Sur

La Union
Nueva Ecija
Pampanga

Pangasinan
Rizal
Zambales

* Means many farmers in many provinces plant during these months.
§ Means only in a few provinces do the farmers plant in these months.

Vegetable	Jan- uary	Feb- ruary	March	April	May	June	July	Aug- ust	Sep- tem- ber	Octo- ber	No- vem- ber	De- cem- ber
Ampalaya	*	*	*	*	*	*	*	*	*	*	*	*
Batao				*	*	*	*		§	*	*	§
Bean (Bountiful), (Kentucky Wonder)	*	*	*	*	*	*			*	*	*	*
Beet	*								*	*	*	*
Cabbage	*	*	*						*	*	*	*
Camote	*	*	*	*	*	*	*	*	*	*	*	*
Cassava	§	§	§	§	*	*	§	§	§	§	§	§
Cauliflower	*	*	*						*	*	*	*
Carrot									*	*	*	*
Chayote	*				*	*	§	§	§	*	*	*
Corn	*	*	*	*	*	*			*	*	*	*
Cucumber	*	*		*	*	*	*		*	*	*	*
Eggplant	*	*		*	*	*		*	*	*	*	*
Gabi	§	§		§	*	*	*		*	*	*	*
Kadios				*	*	*	*	§	§	§		
Lettuce	*	*	*	*	*	*			*	*	*	*
Mungo	*	*	*	*	*	*	*	*	*	*	*	*
Muskmelon	*	*							*	*	*	*
Mustard	*	*		*	*	*			*	*	*	*
Okra	*			*	*	*			*	*	*	*
Onion & garlic	*								*	*	*	*
Patani	§			*	*	*	*			§	§	§
Patola	*	*		*	*	*			*	*	*	*
Pechay	*	*		*	*	*			*	*	*	*
Pepper, sweet	*				*	*			*	*	*	*
Radish	*	*		*	*	*		*	*	*	*	*
Seguidilla	§	§	§	*	*	*	§	§	*	*	*	*
Sitac	*	*		*	*	*	*	§	*	*	*	*
Soybean	§		*		*	*	*	*	*	*	*	*
Squash	*	*		*	*	*			*	*	*	*
Talinum	*	*	*	*	*	*	*	*	*	*	*	*
Tapilan	*	*			*	*			*	*	*	*
Tomato	*	*	§	§	§	§	§	§	*	*	*	*
Tugui		§	*	*	*	*				*	*	*
Ubi			§	§	*	*	§			§	§	§
Upo	*	§			§				*	*	*	*

What To Plant Each Month

For Provinces With Central Luzon Type of Climate

§ Means only some farmers in some provinces plant at the time shown.

Many of us are accustomed to plant our principal field crops at times we have learned they bring the best results. After we harvest our palay, some of us plant other crops, such as tobacco, corn, camote, bean, onion, mungo, squash, tomato, melon, cabbage, and watermelon. The months we select to plant these other crops are simply the months when our fields are free for such use.

This does not mean that these customary months are the only months when such other crops can be successfully grown. On the contrary, we now know that many vegetables can be planted almost any time, provided our fields are not covered with other crops.

For our home garden, therefore, we can plant some kind of vegetable every month of the year. By consulting this Planting Calendar we can learn the months when far-

mers in other barrios with the same kind of climate as ours, actually plant these home garden crops.

In this way we can keep our garden producing all the time, giving us more abundant food, thus making it possible to practice "crop rotation" and also "succession planting," which are discussed in the Guide.

Some vegetables give better results when planted in certain months than when planted in others. Sometimes it is worth while to have vegetables to harvest when the season is not the best, because there is a scarcity. For instance, Bulacan farmers grow tomatoes every month of the year. During certain months, however, their tomatoes are small and few. But prices at such times are very high, so they find it worth while.

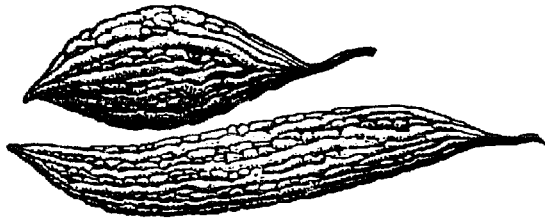
January			February		
Ampalaya	Eggplant	Pepper, sweet	Ampalaya	Eggplant	§ Seguidilla
Bean	§ Gabi	Radish	Bean	§ Gabi	Sitao
Beet	Lettuce	§ Seguidilla	Cabbage	Lettuce	Squash
Cabbage	Mungo	Sitao	Camote	Mungo	Talinum
Camote	Mustard	§ Soybean	Cauliflower	Muskmelon	Tapilan
Cassava	Muskmelon	Squash	Carrot	Mustard	Tomato
Cauliflower	Okra	Talinum	Chayote	Patola	
Carrot	Onion, garlic	Tapilan	Corn	Pechay	
Chayote	§ Patani	Tomato	Cucumber	Radish	
Corn	Patola	Upo			
Cucumber	Pechay				

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March			April		
Ampalaya	Eggplant	Soybean	Ampalaya	Kadios	Radish
Bean	Lettuce	Squash	Bean	Lettuce	Seguidilla
Cabbage	Mungo	Talinum	Camote	Mungo	Sitao
Camote	Mustard	Tomato	§ Cassava	Mustard	Squash
§ Cassava	Pechay	§ Tugui	Corn	Okra	Talinum
Cauliflower	Radish	§ Ubi	Cucumber	Patani	§ Tomato
Corn	§ Seguidilla	§ Upo	Eggplant	Patola	Tugui
Cucumber			§ Gabi	Pechay	§ Ubi
May			June		
Ampalaya	Kadios	Seguidilla	Ampalaya	Gabi	Radish
Batao	Lettuce	Sitao	Batao	Kadios	Sitao
Bean	Mungo	Soybean	Bean	Lettuce	Soybean
Camote	Mustard	Squash	Camote	Mungo	Squash
Cassava	Okra	Talinum	Cassava	Mustard	Talinum
Chayote	Patani	Tapilan	Chayote	Patani	Tapilan
Corn	Patola	§ Tomato	Corn	Patola	§ Tomato
Cucumber	Pechay	Tugui	Cucumber	Pechay	Tugui
Eggplant	Pepper, sweet	Ubi	Eggplant	Pepper, sweet	Ubi
Gabi	Radish	§ Upo			
July			August		
Ampalaya	Cucumber	Seguidilla	Ampalaya	Eggplant	Soybean
Batao	Gabi	Sitao	Camote	§ Kadios	§ Seguidilla
Camote	Kadios	Soybean	§ Cassava	Mungo	§ Sitao
§ Cassava	Mungo	Talinum	§ Chayote	Radish	Talinum
Chayote	Patani	§ Tomato			§ Tomato
		§ Ubi			
September			October		
Ampalaya	Cucumber	Pechay	Ampalaya	Eggplant	Pepper, sweet
§ Batao	Eggplant	Pepper, sweet	Batao	§ Kadios	Radish
Bean	Gabi	Radish	Bean	Lettuce	Seguidilla
Beet	§ Kadios	Seguidilla	Beet	Mungo	Sitao
Cabbage	Lettuce	Sitao	Cabbage	Muskmelon	Soybean
Camote	Mungo	Soybean	Camote	Mustard	Squash
Cassava	Muskmelon	Squash	§ Cassava	Okra	Talinum
Carrot	Mustard	Talinum	Cauliflower	Onion, garlic	Tapilan
Cauliflower	Okra	Tapilan	Carrot	§ Patani	Tomato
Chayote	Onion, garlic	Tomato	Chayote	Patola	Tugui
Corn	Patola	Upo	Corn	Pechay	Ubi
			Cucumber		Upo
November			December		
Ampalaya	Eggplant	Radish	Ampalaya	Eggplant	Radish
Batao	Gabi	Seguidilla	§ Batao	Gabi	Seguidilla
Bean	Lettuce	Sitao	Bean	Lettuce	Sitao
Beet	Mungo	Soybean	Beet	Mungo	Soybean
Cabbage	Muskmelon	Squash	Cabbage	Muskmelon	Squash
Camote	Mustard	Talinum	Camote	Mustard	Talinum
§ Cassava	Okra	Tapilan	§ Cassava	Okra	Tapilan
Cauliflower	Onion, garlic	Tomato	Cauliflower	Onion, garlic	Tomato
Carrot	§ Patani	Tugui	Carrot	§ Patani	Tugui
Chayote	Patola	§ Ubi	Chayote	Patola	§ Ubi
Corn	Pechay	Upo	Corn	Pechay	Upo
Cucumber	Pepper, sweet		Cucumber	Pepper, sweet	

Special Directions For Each Vegetable

AMPALAYA (AMARGOSO)



The ampalaya vine is found everywhere in the Philippines. The fruit is bitter, but we seem to like it just the same. Maybe this is because it contains substances which our bodies need. Even the herbolarios recommend the leaves and juice of the ampalaya for certain kinds of sickness.

Time from seed to maturity: 90 to 120 days.

How Many

Two or three ampalaya vines are enough for our home use. The plant will continue bearing fruit for about two months after the first fruits are harvested.

When And How To Plant

We can plant the ampalaya any-time of the year. When one plant blossoms, it is time to plant another. Usually the ampalaya is planted in hills about 1 meter apart with 3 or 4 seeds to the hill, and later we remove all but the two strongest looking plants. Some

animal manure should be mixed into the hill a week before planting the seeds.

A bamboo trellis should be built for the vines to climb, although many of us allow the ampalaya to grow on a fence or a part of the house.

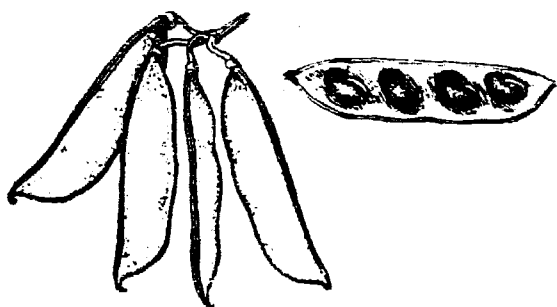
Kitchen Preparation

One of the secrets of preparing ampalaya so it will not taste too bitter, is this: **DO NOT STIR THE AMPALAYA** while it is cooking. We wash the ampalaya before cutting it. Then all we have to do is to cut it in half lengthwise, remove the seeds and soft pulp, and then slice the vegetable into thin slices and cook the slices in boiling water for 3 minutes *without stirring*. This method retains all of the rich minerals, and keeps the vegetable from tasting too bitter. Those of us who have tried this method prefer it to the other method of squeezing the sliced ampalaya in salt water and washing and draining it several times.

Most of us know many ways of preparing ampalaya. Some like it as a vegetable mixed with shrimps or meat. Others prefer the ampalaya guisado, made with fried onion, garlic, tomatoes, salt, and

pepper, to which we add the boiled ampalaya slices and beaten eggs.

BATAO



The batao is considered by many to have the best taste of any of our green beans, when the pods are young and fresh. The tender leaves are also eaten.

Depth to plant seeds: 2½ centimeters.

Distance between rows: 1½ meters.

Distance apart in row: 1½ meters.

Time from planting seed to harvest: 120 days.

When To Plant

Most farmers in Central Luzon plant the batao in May and June. But probably it can be planted during most of the year. Tarlac farmers plant it from May to December.

How To Plant

The batao needs poles or a trellis for the long vines, and is usually planted in hills. It will continue producing for 2 or 3 years, if the soil is kept rich with manure or compost.

BEANS. (BOUNTIFUL, KENTUCKY WONDER)

These beans, called "snap beans," are varieties imported from other

countries. Some grow on bushes and some on vines supported by poles. The other kinds of beans are described under their individual names, such as sitao, batao, and so forth.

Depth to plant seeds: 2½ centimeters.

Distance between rows: 40 to 50 centimeters.

Distance apart in row: 10 to 20 centimeters for bush beans, 50 centimeters for pole beans.

Time from planting seed to maturity: Bush beans, 55-70 days; pole beans, 70 to 80 days.



How Many

Three rows each 20 meters long will supply a family plentifully, with enough left over for canning or giving away. We do not plant them all at once, but in succession every two weeks.

When To Plant

In places with a climate like Central Luzon, with a dry season from November to May and a rainy season from June to October, we can plant these beans at the end of rainy season, say, October, and continuously until the beginning of the next rainy season, say, to May.

Causes Of Failure

Beans like light soil. They do not like soil that is too wet. Even after the seeds have sprouted, top-soil moisture from rain or excessive overhead watering may cause the stem or roots to rot.

Extra Precautions

In heavy soil where a hard top crust is formed, beans find it difficult to break through. This can be corrected by mulching with straw, grass, or 2 cms. of dry powdered soil.

Bush Bean (Bountiful)

These varieties form compact plants 30 to 40 centimeters high. If we pick the beans before they reach full size, and pick them regularly during the bearing season, we will have tender beans and also a longer season. Properly grown bush beans are stringless, tender, brittle, and succulent.

Pole Bean (Kentucky Wonder)

The pole bean takes somewhat longer to reach maturity than the bush bean, but it produces heavily for a longer period.

We usually water the pole beans every week after the bean pods appear.

Before we plant the beans we insert poles 2 to 2½ meters long into the ground to 25 to 30 centimeters. We plant 4 to 5 beans around each pole, pressing the soil after planting. Later we thin out half of the plants, leaving only the strongest-looking seedlings.

Pole beans can also be planted along a wall, fence or trellis, and

trained on wire or string.

Dried Beans

We always allow the largest healthiest bean pods ripen to maturity so we have the best seed for the next season's planting. If we find we have more fresh beans than we want to eat, we can let the excess quantity mature the same as our seed beans, and save them for our table when our garden is not producing.

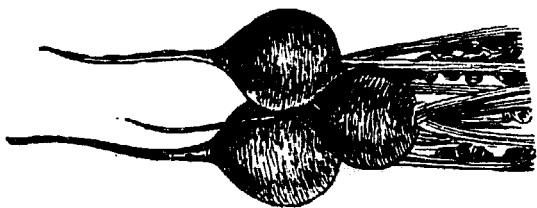
Kitchen Preparation

Fresh beans are good cut into small pieces, cooked with lard (guisado) with meat or shrimps. They are also good when boiled in salted water until they are tender. We do not cover the cooking pot, and we use so little water that most of it is used up in the cooking. If there is any liquid left in the pot, we add it to our soup stock. Cold boiled fresh beans make a good salad when served with oil and vinegar dressing. Adding chopped raw onions makes a tasty dish.

Dried beans should be soaked overnight and boiled slowly until soft. Adding a pork bone, scraps of ham or bacon, and some garlic and onion, makes a delectable dish. Boiled dried beans are a good substitute for meat, and are tasty mixed with our rice. Left-over beans and rice can be mixed to make a delicious fried rice.

BEETS

The red root crop called beet in English (remolacha in Spanish) is grown widely in some parts of the Philippines but is not known in



many places. The root is a delicious vegetable and the leaves are very good "gulay."

Distance between rows: 40 to 50 centimeters.

Distance apart in row: 5 to 10 centimeters.

Time from seed planting to maturity: 60 to 90 days.

Why Plant Beets?

Beets are easy to grow throughout most of the year in any kind of soil. The green leaves are rich in vitamins, and the roots have plenty of sugar. If we have too many beets they are excellent feed for our livestock.

Planting

Beet seeds are usually imported, but the seeds have a long life. If the soil is light, we find it best to soak the seeds in water before planting. We plant the seeds by dropping them in shallow furrows made with a stick. Later we can thin out some of them and transplant them in another row or bed.

If we like only the beet leaves for greens, we can sow them broadcast, and when the tender leaves are high enough, cut them and cook them and forget about the roots.

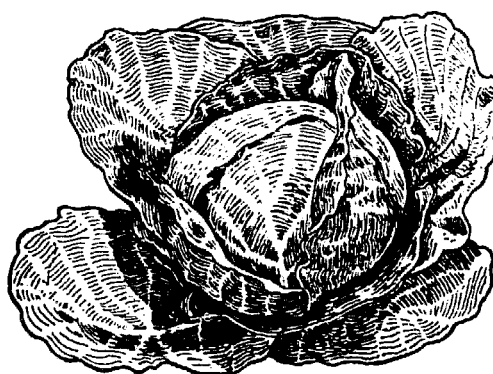
Kitchen Preparation

We cut the greens an inch from the top of the root, and place in

a small amount of boiling salted water.

For the beet roots, we harvest them when small and tender and cook them a short time only in boiling salted water. After cooking we take off the skin and slice them. They also are good with some vinegar or in a salad. It is also good to mix with "sapsoy."

CABBAGE



Many people think that cabbages grow well only in Baguio, but many of us have had success with cabbages in the lowlands where we grow large, firm heads.

Depth to plant seeds: 1 centimeter.

Distance between rows: 50 to 60 centimeters.

Time from planting seed to maturity: 90 to 125 days.

Why Plant Cabbage?

The best reasons for *not* planting cabbages are these: they take up too much garden space; they are attacked by many pests and diseases; and they need plenty of fertilizer.

There are also strong reasons *in favor* of planting cabbages: they are rich in vitamins when eaten

raw; the flavor adds something we like to many of our dishes, such as "puchero," and other boiled viands.

Time To Plant

At the end of the rainy season, beginning as early as September, and continuing to March. In the Mountain Province they are grown throughout the whole year.

Soil

Cabbages grow well in medium and heavy soils, and they like lime. They are fond of plenty of animal manure, which should be spaded into the ground before planting.

Irrigation

A steady and uniform supply of moisture is necessary for cabbages. That may be why we are not always successful with late cabbages that mature in the dry season. If the growth of the cabbages is slowed up by lack of moisture in the roots, and we then start it growing fast again, we will usually find that the heads of the cabbage crack.

How To Plant

The cabbage is transplanted from seedbeds. The seedling should be planted firmly, because the root has to support a large, heavy head. Unless the root is firm in the ground the plant may blow over in the wind. If the cabbages do not form heads, we can tie the outer leaves together with a string, to encourage heading.

Pests And Diseases

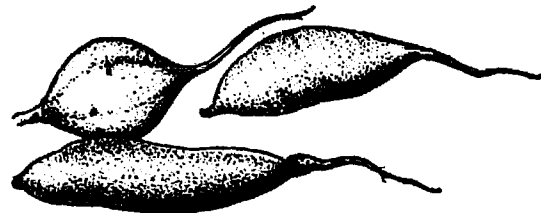
We find it best to plant cab-

bage in a different place each year, as a protection against some of the diseases which multiply in the soil of a cabbage patch. A serious disease called club-root may develop if the soil is too acid. This we can correct by applying lime to our plot. The root maggot (a small white worm which tunnels into the roots and causes plants to wilt) can be controlled somewhat by placing heavy paper around the roots in planting. If the green cabbage worm becomes too much of a pest, we must dust or spray an insect poison on the plant.

Kitchen Preparation

Raw cabbage is tasty when shredded and served as a salad. When cabbage is boiled, leave the pot open so the bad smell can escape. One of the best ways to cook cabbage is to melt some lard in the pan, then add shredded cabbage, cover it and let it simmer for about 10 minutes, occasionally stirring it.

CAMOTES



Depth to plant: 5 to 8 centimeters.

Distance between rows: 1 meter.

Distance apart in row: 45 centimeters.

Time from planting to maturity: 80 to 90 days.

Why To Plant

While camotes are generally a field crop they are a good home garden crop also, because we like the leaves for greens, and we want an extra supply for our pig feed.

Time To Plant

Our farmers plant camotes as a field crop almost any month. It is a perennial plant, and continues producing leaves profitably for a year or more.

How To Plant

The customary way to plant the camote is by using vine cuttings. The cuttings at the tip are the best and we plant the piece of vine with each end exposed above the ground. If we do not have vine cuttings, we can cut a camote into sections and plant the sections. It is best to do this after the camote has some sprouts on it.

Harvesting And Curing

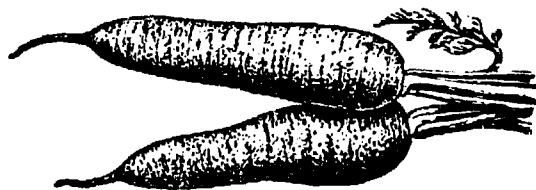
In our home garden we find it best to harvest our camotes by digging with a fork, or spading from the side of the row to loosen the earth so as not to cut the tubers. Camotes are not very good to eat until they are cured in an open but covered place for a week or more. It is better not to harvest them during rainy weather.

Kitchen Preparation

In addition to using camote leaves as a wholesome vegetable, and boiling the tubers as substitute for rice, some people prefer the camote roasted. It is easy to roast camotes in the ash compart-

ment of the clay stove. It is also good for frying or mixing with "guinataan" or "guinatan."

CARROTS



More and more Filipinos are learning to appreciate carrots. In other countries the carrot is called the king of root-crops. We are learning to appreciate its sweet rich flavor and its health-giving qualities.

Depth to plant seeds: 1 centimeter.

Distance between rows: 30 centimeters.

Distance apart in row: 5 to 7 centimeters.

Time from planting seeds to maturity: 65 to 85 days.

Seeds

Carrot seed *must be fresh*. They lose their power to germinate more quickly than most seeds. Even fresh seed germinate slowly, about three weeks after planting. They are so small that they do not contain enough moisture. For that reason we find it a good practice to soak the seeds first, or mix them with moist sand when planting.

Planting

Carrot seeds are planted direct into the growing plot. No seed-box needed. To keep the seeds continuously moist until they germinate, we can place a thin mulch

of chopped straw or powdered manure over the row and sprinkle it with water every day. We can also plant our carrots in the shade of our bush beans.

Soil

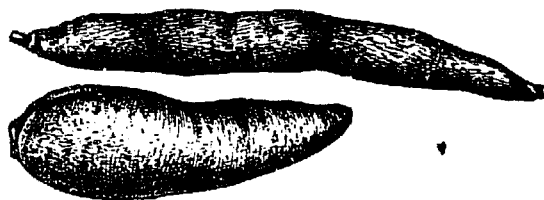
Carrots like a light rich soil, which should be broken into fine pieces without clods or stones. We never use fresh new manure in carrot beds, because it causes the roots to split. Yet the soil should be rich to allow the carrots to mature quickly.

Kitchen Preparation

Carrots are boiled in a small amount of salted water. We scrub the carrots, but do not take off the skin. After they are cooked we like to add some melted margarine for flavor.

Raw carrots are very popular with children, especially sickly children who naturally crave the health-giving minerals and vitamins found in raw vegetables.

CASSAVA



Depth to plant: 10 centimeters.

Distance between rows: 1 meter.

Distance apart in row: 60 centimeters, or closer for fencing.

Time from planting to maturity: 300 to 360 days.

Varieties: For the home garden the sweet cassava known as

"balinhoy" is best. Other varieties: Baker, Mandioca Basiarao, Aipin Mangi.

Why To Plant

The cassava is a good home garden crop because of the ease with which it is grown. It has high food value for the family and for our livestock. It does not have to be planted in a regular garden plot, and is often planted along fences and any other vacant spot. If we want to grow cassava in our fields to sell for starch-making, we should use the bitter cassava, and follow different methods from those described here. We can get information about commercial cassava growing by writing to the Bureau of Plant Industry at Manila, and asking for Farmers Circular No. 11.

When To Plant

The best time to plant cassava is at the beginning of the rainy season.

How To Plant

Cassava is planted from cuttings from the stem about 25 centimeters long. We should not use the top of the stem, but the woody sections. The land should be loosened with a spade to a depth of 30 centimeters. The seed cutting is then stuck into the ground at an angle and the soil lightly pressed around it. In a couple of weeks we should see the growth starting.

Harvesting

The harvesting in the home garden is easiest done by pulling up

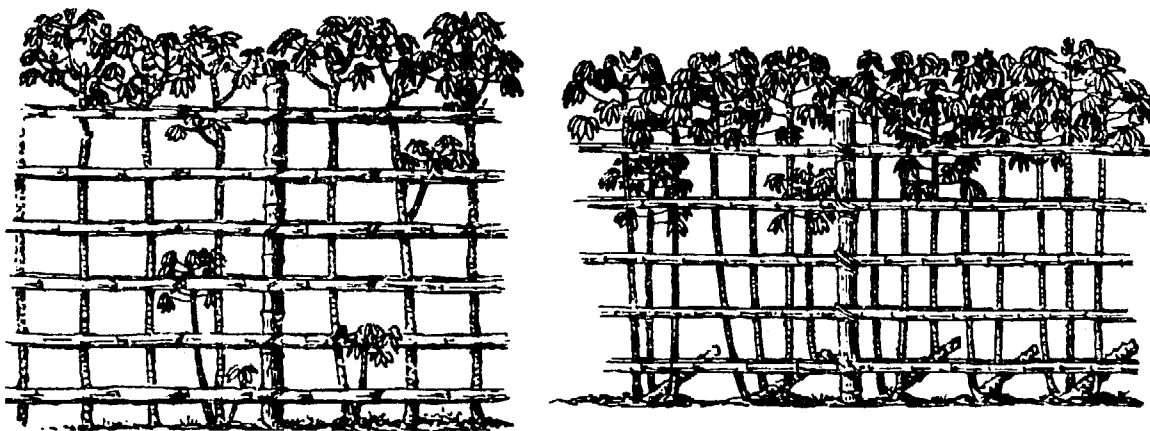


Fig. 32. Cassava fence grows thicker by pruning at top.

the whole plant by the roots. We cut off and plant the sections of stem we need for replacing the plants harvested.

It is best to plant and harvest our cassava continuously, because the roots begin to rot very soon. We find it best to gather only enough cassava roots to use during the next day for our table or as feed for our animals.

Storage

If we want to save some of our cassava for future use, we peel it and cut it into thin slices, which are then dried in the sun. This is called "gaplek."

Cassava Fencing

Many barrio farmers find that the cassava makes a good fence for the chicken yard and the pig pen. This way it serves a double purpose. It makes a strong fence and at the same time produces cassava roots for our use. For fencing we plant cassava stems that are somewhat thick, about $1\frac{1}{2}$ meters long, at intervals of 20 to 30 centimeters. We use wood or thick bamboo corner posts, and close the

fence by lacing bamboo strips between the stems for our pig pen, or fasten a woven bamboo netting to the fence for our chicken yard. (Fig. 32).

When the cassava is well rooted and the leaves become thick, we prune the stems at the top to make the lower branches thicker and cause the stems to become stronger.

The pigs will dig into ground for the cassava roots on their side of the fence. Both pigs and chickens like the cassava leaves.

Kitchen Preparation

The cassava contains a certain poison, especially in the skin, so we must always peel the cassava before using it as food. The sweet cassava does not have much of this poison inside the root, so it can be safely fed to animals. But the bitter cassava should always be cooked before feeding it to the animals.

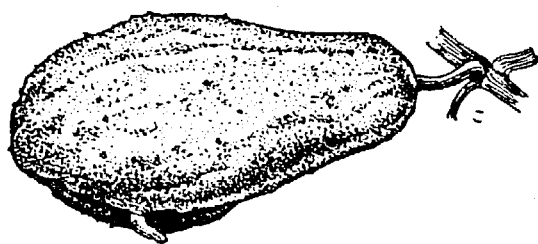
Fresh grated cassava can be used for making bibingka, suman and kalamay. Many families use the young cassava leaf as a vegetable.

CAULIFLOWER

This vegetable is gaining in popularity in the Philippines, because it is good as "gulay" when boiled with other vegetables, especially with "sapsoy." It also makes excellent pickles.

We follow about the same planting and cultivation practices for cauliflower as for cabbage.

To keep the "heart" of the cauliflower white, we tie the outside leaves together with a string.

CHAYOTE

This vegetable is a perennial, that is, it continues producing fruit for several years. One plant is enough for a home garden.

How To Plant

We select a place near a long fence or trellis. Plant the entire chayote fruit, as it contains only one seed. We plant the seed at an angle, with the large end covered

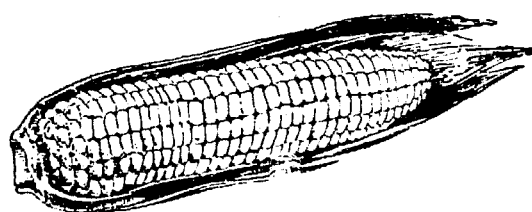
by the soil and the small end sticking out of the ground. When it starts growing, we should keep adding manure or fertilizer from time to time as it is a very active plant. After about 3 months we can begin harvesting the vegetable.

Kitchen Preparation

For boiling we cut the chayote crosswise through the seed as thick as a slice of bread. Then we pare off the skin with a knife. It is then placed in a covered pot of boiling salted water and cooked 15 or 20 minutes, or just until tender. It is good served with margarine, cream sauce, tomato sauce, or toyo.

Fried chayote is prepared by dipping the slices of boiled chayote in beaten egg and bread crumbs and frying until brown.

It is a good "gulay" if we cook the sliced fruit with lard (guisado) mixed with shrimps or meat.

CORN

Corn as a garden crop is a favorite, because we can enjoy fresh corn from our garden many months of the year.

Depth to plant: 2½ centimeters.

Distance between rows: 50 to 60 centimeters.

Distance apart in row: 15 to 20 centimeters.

Time from planting to harvesting as boiling or roasting corn: 60 to 80 days.

Varieties: We can plant the same varieties of corn in our garden which we plant in the field, such as Yellow Flint; Cagayan Yellow; Cebu White. Or if seed is available, we can plant sweet corn, which is more tender, such as Golden Cross Bantam, Hawaii Sweet, USDA 34, etc. Some of us prefer the glutinous Lagkitan corn which is very tasty.

How To Plant

If we buy hybrid seed we need only one seed to the hole. But hybrid seed needs fertilizer for best results. So with a stick we make a hole $2\frac{1}{2}$ centimeters deep, and drop in one seed. Then we make another hole 5 centimeters from the first hole and $7\frac{1}{2}$ centimeters deep, and into this second hole we drop a tablespoonful of ammonium sulphate fertilizer or a large handful of manure. When the seeds send out roots they find the fertilizer and if there is the right amount of moisture the corn will grow so fast that it will shade the ground and make weeding unnecessary. By placing the fertilizer in a hole near to and lower than the seed, the weeds do not get the benefit of the fertilizer.

When we do not have hybrid corn seed we usually plant 3 or 4 seeds in each hole. Then, after the plants are up, we remove all but the two strongest plants. Even if we do not use hybrid seed, we should follow the same system of applying manure or fertilizer. Because of the close planting we need richer soil for plant growth.

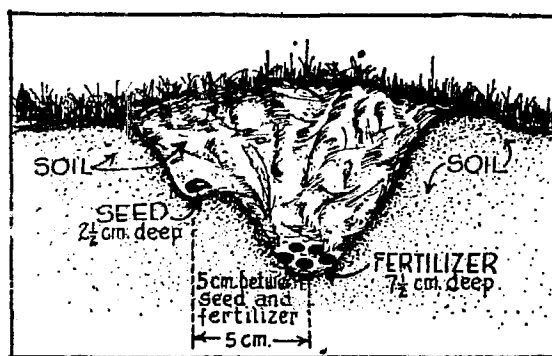


Fig. 33. Placement of seed and fertilizer for "spot fertilizing" corn.

Mulching

For corn in our garden we find it worthwhile to fill the space between the corn plants with rice straw, cogon, leaves, rice hulls or other form of mulch, to conserve moisture and suppress weeds. We do this as soon as the corn plants come up a few centimeters. This mulch gradually rots and enriches the soil. This is especially important when our soil is a clay type.

Liming

Corn does not like soil that is sour or acid. If our corn does not grow vigorously, maybe our soil is acid. We can correct this by adding powdered lime (apog) to the soil.

Caring For The Corn

If the soil is moist when we plant the seeds, we do not have to irrigate the corn until it is 20 centimeters tall. Then, if the ground is dry, we allow water in the ditch between the rows, but not so much water that we flood it.

We cultivate the corn by loosening the top soil with a hoe and we remove the weeds. But if we plant the corn close together and use enough fertilizer, such as ca-

rabao or chicken manure or ammonium sulphate, we won't have much of a weeding problem.

If we follow the mulching system already described we will not have to do much cultivating or watering. A farmer told us that before he planted his corn in February, he covered the plot with a thick mulch of straw and grass about 15 centimeters deep. He planted the seed through openings he made in the mulch with his fingers. This mulch kept the weeds from growing and kept the soil from drying, so he did not have to water it even during the dry season. By the time the corn was ripe the mulch had become rotten, and only then were the weeds beginning to come up. By that time he did not care. After gathering the corn he spaded the rotted mulch into the soil as organic fertilizer.

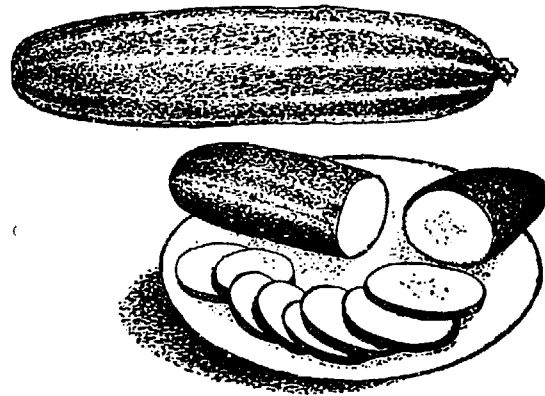
Kitchen Preparation

We all know how to cook corn. In addition to what we already know we must remember that corn is most tender when cooked at once after it is gathered. One housewife tells us that she never picks the corn in her garden until the water on the stove is already boiling. She also tells us we should remove boiled corn from the water as soon as it is tender. We have found that if we add a tablespoonful of sugar to the boiling water it improves the flavor.

CUCUMBERS

Depth to plant seeds: 1 to 2½ centimeters.

Distance between rows: 1 to 1-1/2 meters.



Distance apart in row: 1 meter.
Time from planting seed to maturity: 60 to 75 days.

How To Plant

To save space in our small garden, we will probably find it best to plant our cucumbers in bins about 1-1/2 meters apart and let them be trained on bamboo trellises. We plant 3 or 4 seeds per hill, the pointed ends of the seed down. As the plants grow we select the best and leave 2 or 3 plants in each hill, evenly spaced.

We provide irrigation ditches around the hills (or between the rows) so we can water the roots when necessary.

Soil

The cucumber likes plenty of manure, so we should bury about 4 handfuls of rotted manure or compost 30 centimeters deep in the planting hill.

Training Of Vines

When the center stem is well started we train it upwards on our trellis, until it reaches the top, about 1 meter high. Then we pinch off the top. Then we train the lateral stems sideways, and

pinch them off when the blossoms appear, because the best fruit is produced on these lateral stems.

Pests

Most of us will not have sprays to kill the insects and worms which sometimes attack the cucumber. If the leaves wilt badly from disease, it is best to destroy the plant and burn it.

Kitchen Preparation

Cucumbers are good raw in salads. Also, they are tasty when sliced very thin, without removing the skin, and eaten with salt. The cucumber is an important addition to our homemade pickles.

EGGPLANT



Depth to plant seeds: Not quite 1 centimeter.

Distance between rows: 50 to 60 centimeters.

Distance apart in row: 50 to 60 centimeters.

Time from seed planting to maturity: 90 to 150 days.

Varieties: Long Purples; Long Green; and Round Purple.

Time To Plant

The eggplant can be grown most months of the year. We can start planting in the seedbox just before the end of the rainy season. One plant for each member of the family is usually enough, so if we sow a few seeds every 3 weeks, we can transplant two or three seedlings

at a time and enjoy eggplants during a long season.

In some barrios it is the custom for one of the farmers to plant a seedbox with enough for all his neighbors, who get a couple of seedlings at a time for transplanting in their own gardens.

Soil

Eggplants grow in almost any kind of soil. After the plants are well established, we find it a good practice to add liquid manure around the roots every 3 weeks.

Care Of Plant

Mulching around the stem with straw or leaves is a very good way to keep the weeds from growing and to keep the soil moist. If there are too many blossoms we pick off some of them so the plant will not produce too many small fruits. We find that 4 or 5 large fruits for each plant is sufficient. It is also a good practice to pinch off the end of the stem after enough fruit has appeared.

Kitchen Preparation

Favorite ways of serving eggplant are fried, and fried or baked after stuffing the eggplant with chopped meat. Sliced boiled eggplant that has not been cooked too soft makes a good salad.

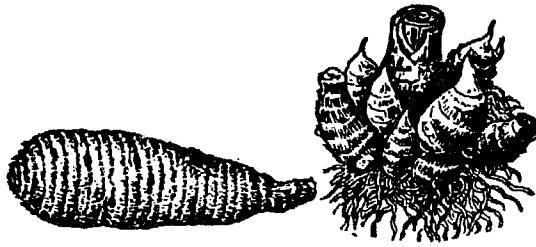
GABI

Depth to plant: 30 centimeters.

Distance between rows: 80 to 90 centimeters.

Distance apart in row: 50 to 80 centimeters.

Time from planting to maturity: 8 to 14 months.



Varieties: Purple leaf and green leaf; wet culture and dry culture. The variety called "dashheen" is considered best for the home garden.

Why To Plant

Gabi is a rich energy food, easy to grow, and has very few pests. It furnishes food for both man and beast. It is rich in vitamins. Both the roots and young leaves are eaten. Not enough gabi is grown in the Philippines to supply the demand.

Choice Of Varieties

Most of our gabi is grown where the soil is nearly always moist, as it needs plenty of water. But there is also a variety which grows in soil that is not very wet. This variety is spreading very rapidly, and one plant sometimes produces a full basket of roots. If our land is not moist or easy to irrigate we should try to get this dry culture variety called "gabi Leyte," or "gabi San Fernando."

How To Plant

Gabi is planted from the harvested tubers or roots. We plant the gabi tubers about 30 centimeters deep, slightly covered with soil.

Time To Plant

In most provinces of Central Lu-

zon, gabi is planted from April to June and again from October to November. But some farmers plant almost any month of the year with good results.

Care Of Gabi

If we plant the ordinary gabi which needs moist soil, we have to irrigate regularly unless it is planted in a place which is always moist. It can grow even in standing water if the water is not deep.

Harvesting

We can harvest the sprouts when they are tender and use them as a fresh vegetable. The roots are ready to harvest when we see the leaves becoming dry and not growing any more. However, some farmers harvest only the fully matured roots and let the plant continue producing for several years.

Kitchen Preparation

The gabi sprouts are served as a salad. If we hill up the earth around the sprouts they will become white and very tender like asparagus.

The gabi Leyte is especially good when fried or roasted the same way we cook potatoes and camotes.

Gabi is often boiled until it is soft and mixed with sugar and grated coconut.

KADIOS

Depth to plant seeds: 2 to 3 centimeters.

Distance between hills: 80 centimeters.

Time from planting seed to maturity: 6 to 8 months.

Why To Plant

The kadios is a sturdy bush which grows easily and produces abundant beans for our food, and our cattle relish eating the nourishing leaves and pods. It can take the place of mungo as a food crop. For the home farm it has the advantage of using less space than the mungo.

Time To Plant

Kadios is generally planted in May and June by some farmers and others plant it also in April and July.



How To Plant

The kadios grows best in loose, well-drained soil. It is usually planted in hills about 80 centimeters apart. The soil in the hills should be finely pulverized to a depth of 20 centimeters, and about 50 centimeters across. Compost, or dry cattle manure, or poultry manure should be mixed with the soil.

Harvesting

The kadios can be harvested while the pods are green and tender, for a fresh vegetable. Otherwise, we let the pods get mature and harvest the dry beans.

LETTUCE



Depth to plant seed: 1 centimeter.

Distance between rows: 25 to 40 centimeters.

Distance apart in row: 20 centimeters.

Time from seed planting to maturity: 60 to 70 days.

Varieties: Big Boston; Iceberg; Imperial; Black Seeded Simpson; Grand Rapids, etc.

When To Plant

Lettuce grows best when planted at the end of the rainy season, starting with October, and continuing to March. However, when planted late it suffers from the hot sun of the dry season. We will learn by experience how to lengthen the planting season in our own locality. We can plant some lettuce every 2 months of the year. If this way gives us more lettuce than we can eat, the extra can be fed to our chickens and pigs.

How To Plant

Most of us find it better to plant the lettuce in our seedbox first, and transplant it when it is 3 to 6 centimeters high. This way, in addition to planting it in plots, we can transplant it to any vacant space in our garden or along the

path as borders, or between the rows of maturing crops. This saves a lot of space in our small garden.

Care Of Lettuce

The lettuce that matures during the hot season needs plenty of water and plenty of shade. If we have some vine growing on a trellis, we can plant our lettuce under its shade, or under a large tree. Lettuce is not attacked by any serious pests or disease. If our garden is infested with the Giant African snail (Japanese snail) we have to gather these leaf eaters.

KANGKONG

Most of us know kangkong as a plant growing wild in muddy places or floating on the water. It is such a tasty green vegetable that we miss it when we are not close to where it grows.

But kangkong also grows well when planted as a vegetable in the garden. All it needs is to be watered like other vegetables. If stem cuttings are used for planting, they should be at least 30 centimeters long, and two stems planted a little apart in hills every 50 centimeters. Two-thirds of the stem should be in the soil and one-third above. Constant watering is necessary in the beginning to make the plants grow quickly.

In addition to using kangkong for our sinigang and as a fresh vegetable, it is also a good addition to the feed we give our pigs, chickens, and other livestock.

MUNGO



Depth to plant seeds: 2½ to 3 centimeters.

Distance between rows: 50 centimeters.

Distance apart in row: 30 centimeters.

Time from planting seed to maturity: 80 to 90 days.

Varieties: Determined by color of their seed, as yellow, black, and green.

Why To Plant

As a garden crop the mungo is one of the most nourishing food crops we can raise. It is a good substitute for meat, and is highly recommended as a remedy for beri-beri. The mungo is also an important food during pregnancy.

In addition to the mungo beans, the fresh plants are good livestock feed. Being a legume, the mungo enriches the soil where it is grown. We do not find it worth while to plant mungo in our home garden, unless our lot is rather large.

When To Plant

The mungo can be planted almost any month of the year. As a field crop we generally plant it at the end of the rainy season, from September to February and again during April, May and June.

How To Plant

For the home garden we plant the mungo in furrows, about 50 centimeters apart. To utilize the space between the rows we can plant radishes or carrots between. When the bushes are well grown, hot season lettuce can be grown between the rows, to benefit from the shade.

We cultivate the mungo only when the weeds get too thick. It is a good practice to hill up the rows slightly when cultivating.

If we plant the rows closer together, say 30 centimeters, like we do in the field, the leaves will soon extend from row to row and keep down the growth of weeds.

Harvesting

As the mungo pods ripen at different times, we harvest them as they mature. They are ready to harvest when the pods turn pale yellow to yellow-brown, or black in the case of the black mungo. We find it best to pick the ripe pods in the early morning, when the pods are soft and will not crack open and cause the seeds to be lost.

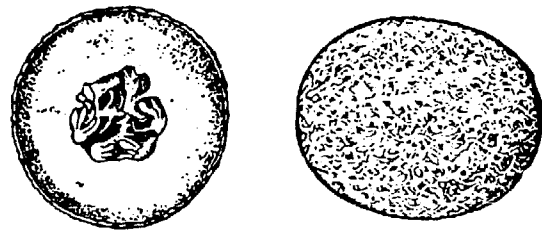
We dry the pods in the sun a few days until they are dry enough for threshing. For our small garden crop the best way to thresh the mungo is to put the pods in a sack and beat them with a bamboo. We can winnow the seed in a flat basket.

Kitchen Preparation

The boiled mungo can be mixed with chopped onion, oil and vinegar and served as a cold salad. Some of us like it boiled in salted

water with a small piece of pork or ham for flavor, and garlic and onions added. This dish tastes good mixed with our boiled rice. Mungo is also used in a number of sweet dishes.

MUSKMELONS



Depth to plant seeds: 2 to 3 centimeters.

Distance between rows: 2 to 2½ meters.

Distance between hills: 1½ to 2 meters in the row.

Time from planting the seed to maturity: 90 to 120 days.

Fresh seeds (preferably imported) of varieties found suitable to Philippine conditions produce more and better quality fruits. Home grown melons ripened on the vine taste better than those we buy. But home gardens are not the place for muskmelon; they occupy too much space. We need our lot for more important vegetable crops. Melons should be grown in the open field.

When To Plant

October to December.

How To Plant

The field for melons may be plowed and harrowed before the preparation of the hills. If the

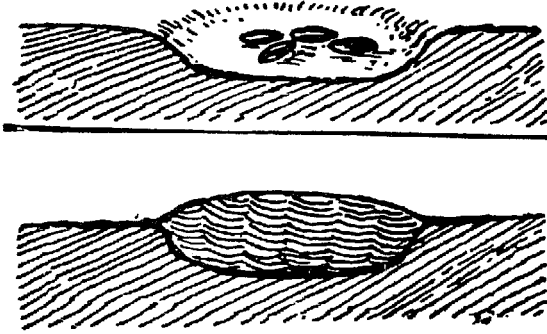


Fig. 34. Muskmelons are planted in raised beds.

soil is dry, it should be irrigated first. The hills which are about 1 meter in diameter are dug and hoed and liberally applied with well rotted manure.

Five to eight muskmelon seeds are sown singly about 5 centimeters far apart in the prepared hills. This will facilitate thinning later on.

Care Of The Plants

If the soil had the right moisture content at planting time, the seeds will germinate without difficulty. The young plants should be dusted or sprayed regularly with any suitable insecticide as soon as the false leaves have spread. At the seedling stage muskmelons are easily attacked by insect pests.

When the young plants have 3 to 5 true leaves, they should be thinned to 2 to 3 plants per hill. The most vigorous and stout plants should be left to grow. Guide the vines to spread evenly over the field. By limiting the number of fruits per vine to about a dozen and spacing their maturity period,

good sized quality fruits will be harvested.

Irrigation

The muskmelon does not like wet soil. If irrigation is necessary, it should be done before flowering. Just sprinkle a thin layer of water over the field and drain at once. One irrigation of this nature will be sufficient to mature the crop. Good quality crop is assured in a dry soil towards maturity.

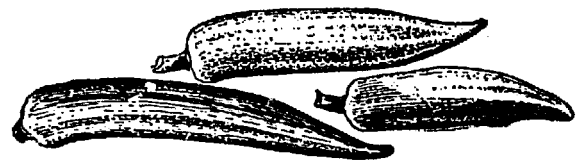
Harvesting

Excellent flavor and fine quality come with the full maturity of the fruit. When harvested rather green, it lacks flavor and sweetness. The melon is ripe when you can separate the stem from the melon, by a light pressure of thumb, and it breaks clean without the skin of the melon coming off with it.

MUSTARD AND PECHAY

Turn to PECHAY for planting directions.

OKRA



Depth to plant seed: 2½ centimeters.

Distance between rows: 70 to 80 centimeters.

Distance apart in row: 25 to 35 centimeters.

Time from planting seed to maturity: 60 to 80 days.

Time To Plant

Farmers customarily plant okra from April to June and again from October to January. Perhaps that is because these are the periods when their fields are not producing other crops. In our home gardens we may discover by trying that we can plant okra successfully during other months.

Care And Harvesting Of Okra

Okra is cared for about the same way as our garden corn. It is harvested before the seeds are too big, when it is used as a fresh vegetable. With succession planting we can have plenty of okra for many months.

If too much okra matures until the pods are dry, we can remove the seeds from pods and dry them. They can be used later the way we cook dry beans, or fed to the chickens and pigs. In other countries dried okra beans are an important food crop.

Kitchen Preparation

Fresh okra is stewed with tomatoes, or boiled in water flavored with vinegar and afterwards served cold as salad or with meats.

Here is a favorite way of preparing fresh okra:

Put a tablespoonful of lard in a pan and add chopped onion, garlic, and green onion. After cooking for 6 or 8 minutes add some chopped tomatoes, with the juice, and salt and pepper. Now add the tender fresh okras and let the mixture cook slowly for about 20 minutes.

ONIONS AND GARLIC



Distance between rows: 30 centimeters.

Distance apart in row: 10 to 15 centimeters.

Time from planting to maturity: 120 days.

Kind Of Onions

For the home garden we find the native onions best. These are of two kinds, the small one called the Chinese, and also called the shallot, with a long neck and about $\frac{1}{2}$ centimeter wide by $2\frac{1}{2}$ centimeters long, and the so-called Singapore onion, about 2 centimeters in diameter, and more rounded. Both kinds have two or more segments, called cloves or bulbils, which are used for planting materials.

Although the large Bermuda onion is being grown in many places as a field crop, for our home garden we will find the native onion easier to grow and sufficient for our kitchen needs.



Fig. 35. Tagalog or Chinese onion is very tasty.



Fig. 36. Singapore onion has rich flavor.

When To Plant

We can plant our onions and garlic beginning right after the rainy season, from September to January. It is better to plant a fairly large plot during the month we have learned they grow best, so as to have a good supply to dry and store for our use during the whole year. In addition we should plant a few extra from time to time to have a supply of green onion tops for our table.

How To Plant

The segments of onion or garlic are planted direct into well drained beds made of finely broken loose soil. The onions are planted with the tips exposed above the ground, and we press the soil around the buried portion.

Onions and garlic need hand weeding, light cultivation, and regular watering.

Harvesting And Drying

When mature the onions and garlic are pulled and dried a day or two in the sun. When the tops are dry they are tied in bunches, and hung in the kitchen or store-room.

PATANI (LIMA BEAN)

Depth to plant seeds: 2½ centimeters.

Distance between rows: 1 meter.

Distance apart in row: 1 meter.

Time from seed to maturity:
120 days.

Varieties: White seed variety and colored seed variety.

How To Plant

The patani is planted in hills, with poles to support the vines.

Time To Plant

The patani is generally planted in Central Luzon from April to July, although some farmers find that it can be successfully planted also from October to January.

Harvesting

The patani is harvested for home use as a green bean, before the seeds become hard.

Kitchen Preparation

Patani is usually cooked in salted water. Many housewives tell us that the colored patani seeds should be boiled in several changes of water. They also warn us against eating the wild patani gathered in the thickets, as they sometimes cause sickness.

PATOLA

Depth to plant: 2½ centimeters.

Distance between rows: 1 meter.

Distance apart in row: 1 meter.

Time from planting to harvest:
100 days.



How To Plant

The patola is usually planted in hills, with a trellis to support the vine and fruits.

When To Plant

In Central Luzon the patola is planted in May and June, and also from September to January.

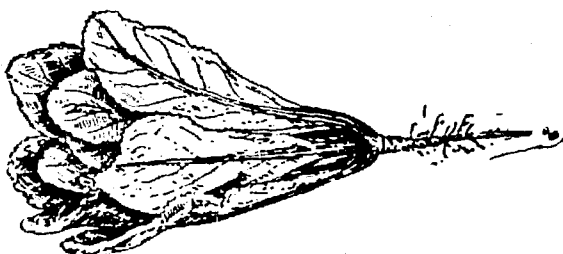
Harvesting

The patola is harvested while the fruit and the seeds are tender. The fruits that are allowed to get fully ripe for next season's planting have another use. We remove the seeds and pulp, and the fibers that remain furnish us a useful bath brush or sponge.

Kitchen Preparation

Patola is eaten cooked with other vegetables, or with shrimp or pork.

PECHAY AND MUSTARD



Depth to plant: 1 centimeter.

Distance between rows: 60 to 70 centimeters.

Time from planting seed to maturity: 90 to 100 days.

Soil

The pechay grows fast and needs a rich soil, with plenty of manure or compost. The soil should be well raked and broken up fine.



Planting

We can broadcast the seed or plant them in furrows, and later thin out the plants if necessary to prevent crowding, or we can sow the seed first in a seedbox and transplant when they are about 6 centimeters high.

Care Of Plants

The roots of the pechay need plenty of water, like cabbages, so we have to examine the earth regularly to see if it is moist. During the dry season we will find it best to cover the pechay bed with a thick mulch of leaves or straw to keep the soil from drying out too quickly.

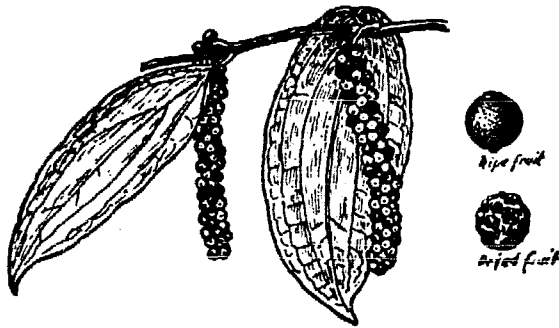
If we have some ammonium sulphate fertilizer, it is good to add some twice a month. Pechay is improved by fertilizing the ground with urine from our livestock.

Kitchen Preparation

Pechay is boiled and served as "gulay." Some of us like it raw, chopped or shredded in thin pieces, and mixed with salad dressing.

PEPPER, BLACK

Black pepper berries are an important seasoning or condiment for our food. Two vines of this spice will supply us enough for our family needs.



How To Plant

The black pepper vine needs shade and plenty of moisture. It can be planted along a fence of ipil-ipil, madre de cacao, or bag-bag, or under the bananas. If planted under the bananas the vine should have a bamboo frame to climb on, so it will not climb on one of the banana stalks which you will later want to cut down after it has fruited.

When the outer skin of the black pepper berry is removed we get the white pepper.

Black pepper is best propagated by means of cuttings from the vines. The cuttings are either planted directly in their permanent places or are started in a pot until they take root.

Care Of Black Pepper Vine

When the vine reaches the desired height on the support, say, 2 or 3 meters, we pull it down and train it sideways, so the fruits will be easy to reach. If only one stem arises on the support we cut off the top to induce more shoots to grow. During the dry season it is important to pile a mulch of grass, leaves or straw around the base, to keep the soil moist, and when the mulch rots, it adds fertility to the soil.

Harvesting And Drying

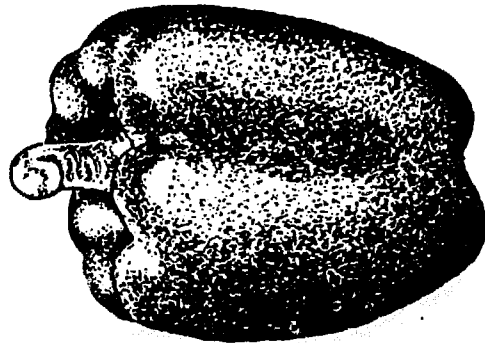
The black pepper begins bearing fruits in one year to two years, and the vine produces continuously for 15 years or more. The fruits are green at first, turning yellow, and then black when they are ready to harvest. The fruits on a bunch do not mature at the same time. Only the black mature ones should be harvested.

The picked pepper berries are dried in the sun two or three days, and then cleaned by winnowing, and stored in a jar ready to be used as needed. When the outer skin or pulp of the black pepper berry is removed it becomes white pepper.

Producing Black Pepper For Sale

Some of us with unused space in our garden may want to plant many pepper vines, so as to have a small extra crop for sale. We can take cuttings from our own plants after the first year.

PEPPERS, SWEET



Depth to plant seeds: 1 centimeter.

Distance between rows: 35 to 40 centimeters.

Distance apart in row: 30 centimeters.

Time from planting seed to maturity: 70 to 100 days.

We like the taste of the large green and red peppers, also called bell peppers, that have a sweet taste and are not too hot. The hot peppers, such as the "tsile" and the long pepper, are for our plot of flavoring herbs. The sweet pepper belongs to our vegetables plots, and every home garden should have just a few plants producing as many months as possible.

When To Plant

In Central Luzon we plant the sweet peppers beginning right after the rainy season, as early as September and continuing to January. We can plant them again in May and June.

How To Plant

Sweet peppers are planted first in the seedbox, and later transplanted to the garden plot, the same as eggplants and tomatoes.

How To Care For Peppers

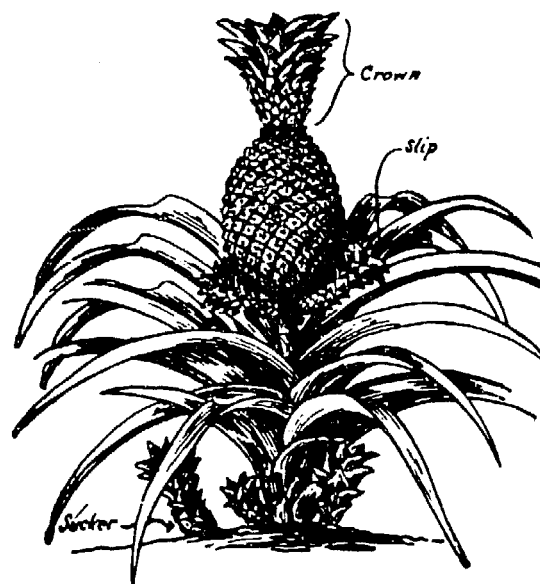
The peppers do best in a well-drained rich soil. So after the plants are growing well, we make ditches between the rows, or around each plant, so we can irrigate the roots without flooding them. Watering every 10 days is usually enough. Thick mulching with leaves, grass, or straw is recommended. We find it best to pick the peppers as they ripen, so the plant can continue producing fruit for a longer period.

Kitchen Preparation

Peppers are sliced and served with salads, and added to many

vegetable dishes. Stuffed peppers are very good. We should cut off the stem end, remove the seeds, and then boil the pepper for about 5 minutes until it is tender. Next we stuff it with a mixture of boiled rice or corn, chopped meat, chicken, or fish, and some chopped tomato. Then we bake it, or fry it until it is well cooked.

PINEAPPLES



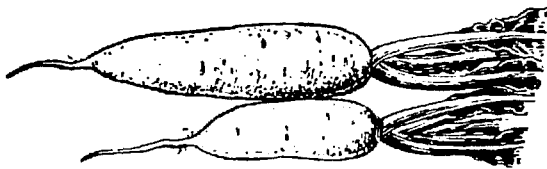
In addition to the vegetables and melons, the pineapple is a good fruit for the SAMAKA garden. The native pineapple grows well in the sun or shade. It can be planted along the borders of the pathways, next to fences and under fruit trees. We can start pineapples by planting the green "crowns" from a ripe fruit, or the "slips" that form along the stem of the mature plant, or the suckers (ratoons) that develop at the bases of old stems after we pick the fruit. Some people prefer the spineless pineapple (Hawaiian) which produces larger fruits.

Pineapples should be planted during May-June and November-December. The plants should be spaced 45 to 60 centimeters apart. The suckers and slips will bear fruit in about 12 to 18 months, but when the crown is planted it takes about 24 months to bear fruit.

While the original plant bears fruit only once, it sends out suckers (ratoons) from the mother plant, so that the pineapple hill will continue bearing fruit every year for several years. It is better to pull out the old plants after about 5 years, when heavy base roots are already exposed on the ground surface.

Cultivation should not be deep because it might injure the roots. It is better to place a mulch of straw, grass, or leaves on the ground around the plant, to prevent the growth of weeds and to keep the ground moist.

RADISHES



Depth to plant: 1½ centimeters.

Distance between rows: 20 centimeters.

Distance apart in row: 2½ centimeters for small varieties and 6 to 8 centimeters for big varieties.

Time from seed planting to maturity: 25 to 50 days.

Radishes are popular in the home garden because they are so

easy to grow and mature very quickly.

When To Plant

Radishes may be planted from the close of the rainy season to the end of the dry season.

Soil

Radishes grow well in almost any kind of soil but preferably loose soil. We should never use fresh manure in the soil where we plant radishes.

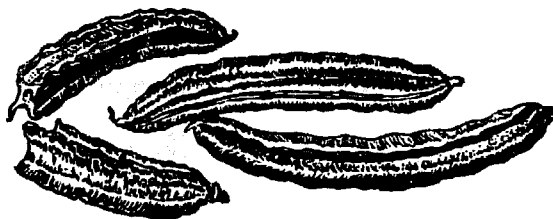
How To Plant

The radish seeds are dropped into a shallow furrow and covered lightly with fine soil. If we want large radishes, we should ridge the soil around the plant. If our garden space is small we do not have to set apart a separate plot for them. We can scatter the seed between rows of plants that grow slowly, or in any spare corner of the garden where there is moist friable soil.

Care Of Radishes

The soil of the radish bed should always be kept moist, otherwise the roots may become tough and stringy. Occasional weeding and cultivating is needed.

SEGUIDILLAS



Depth to plant: 3 centimeters.

Distance between rows: 1 meter.

Distance apart in row: 1 meter.

Time from seed planting to maturity: 120 to 150 days.

How To Plant

Seguidillas grow fast in hills, with 2 to 5 seeds per hill. While they grow on poles, we find it better to build a trellis of bamboo slats about 1½ meters high.

When To Plant

Farmers in Central Luzon have planted seguidillas successfully nearly every month of the year, although April to June and September to December seem to be the preferred months. The seguidilla continues to bear abundant fruits for several years, if we add compost fertilizer from time to time.

SINKAMAS

Sinkamas is an edible root of a leguminous viny plant that trails on the ground like the camote. Sometimes it is trellised. Several roots are produced in one hill. Sinkamas is a dry-season plant. Almost any good, rich, loose soil can be used for the growing of sinkamas. Sinkamas are grown from seeds which are planted in the place where the plants are to grow. They are usually planted 15 centimeters apart, in rows 70 centimeters apart. They are cultivated until the vine begins to cover the ground. In 2 to 3 months, the edible root is ready for harvesting.

Sinkamas seeds are obtained as follows:

When a crop of sinkamas is harvested, the largest and best roots are hung up in some part of the

house or of the stable where they will not be damaged by rats. In 60 to 90 days they will dry up considerably and will send out young growth. As soon as these shoots begin to grow, the entire root is planted in rich soil. It is given all possible attention and a stake is supplied for the vine, which grows rapidly and profusely. In about 40 days a large number of pods containing many seeds is produced.

SITAO



Depth to plant seed: 3 centimeters.

Distance between rows: 1 meter.

Distance apart in row: 60 to 80 centimeters.

Time from seed to harvest:

Green sitao, 60 to 80 days.

Dried pods, 90 to 100 days.

Varieties: Singapore Bean, Sitao Morado.

Time To Plant

Almost any month of the year, except March and April.

How To Plant

The sitao is planted in small furrows in our prepared plots, or in hills 60 to 80 centimeters apart, 2 or 3 seeds to the hill. They must have a stake or pole for the vine to grow on. If planted while our corn is growing, we can plant the

sitao close to the corn, and the corn stalks become the stakes for the vines.

Care Of Sitao

Weeding and occasional cultivating are needed. In the dry season we should water the sitao about every 10 days. It is a hardy vegetable that does not need too much care, but the application of manure or compost to the soil increases the yield.

Sitao As Auxiliary Field Crop

Barrio farmers who plant rice are more and more following the profitable custom of planting sitao along the dikes of the rice fields.

This gives us an additional crop and does not reduce the rice yield. The sitao planted here not only gives us an extra vegetable for our home, but if we let the pods mature it gives us plenty of dry beans for our poultry and pigs.

The farmers who practice this method of planting sitao do it this way: The sitao seeds are planted on *each side* of the dike (pilapil) about 15 centimeters from the top.

Before planting we prepare enough bamboo stakes or poles to provide one for each sitao plant. We first use the point of the stake to make a hole for planting the sitao seeds, 2 or 3 to the hole, and then after covering the hole with earth, we drive the stake into the ground near the hole, to provide a pole for the climbing sitao vine.

This stake is driven at an angle, sloping away from the pilapil towards the field. In this way the growing vines will not obstruct our passage along the top of the pilapil. (Fig. 37).

If we are tenant farmers, the law gives us the right to 80 percent of the sitao we raise in our rice fields as auxiliary crop. Most landlords probably will not ask for a share, because the sitao enriches the field, especially if we plow the old vines back into the field. However, if the landlord demands a share we can deliver it without threshing, as dried sitao can be stored in the form of pods.

We find this method of plant-

Fig. 37. Planting sitao along dikes of rice field brings extra crop and enriches soil.



ing sitao very profitable, because as SAMAKA farmers we are raising chickens, pigs, and other livestock for our family use, and need the extra sitao to feed the animals.

Kitchen Preparation

Fresh sitao is boiled in a small amount of salted water for a vegetable dish. Cold boiled sitao, with chopped onions, oil and vinegar makes a tasty salad. The dried sitao beans can be cooked as we cook mungo, or made into adobo.

SITAO, BUSH

In recent years the University of the Philippines College of Agriculture has crossed native sitao with the cowpea (*paayap*, *balatong*) and in this way produced a new type of sitao that grows on bushes, instead of on vines. Seeds of this "bush sitao" are now being sold in some stores.

The bush sitao is becoming very popular because it produces abundantly and does not require the use of poles or trellises.

Depth to plant seed: 3 centimeters.

Distance between rows: 50 centimeters.

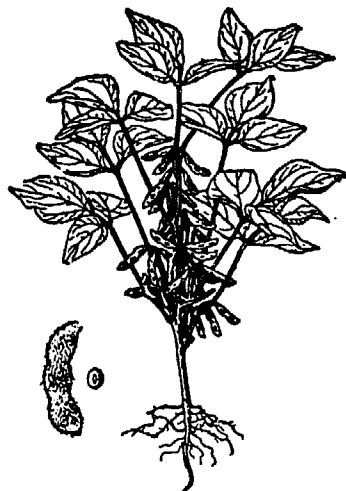
Distance apart in row: 10 centimeters.

Time To Plant

Almost any month except March and April.

Care of bush sitao: Same as beans.

SOYBEANS



Depth to plant seeds: 4 centimeters.

Distance between rows: 50 to 80 centimeters.

Distance apart in row: 15 to 20 centimeters.

Time from planting seed to maturity: 90 to 100 days.

The soybean, also known as *utao* and *balatong*, has been grown in most parts of the Philippines. For the SAMAKA garden we find the best variety to be the *vegetable soybean*, or Bansei variety. This variety is harvested while the pods and the beans are still green. After shelling the beans, they are boiled and eaten as a fresh vegetable. But some should be allowed to mature for seeds.

Why To Plant

Every SAMAKA farmer should try the soybean in his garden. In this way we will learn more about how to grow this valuable plant. It is important for us to learn these things, because the soybean is sure to be planted in many fields as a commercial crop, as soon as

more farmers of the Philippines appreciate its value. We can start with a small plot. But we predict that our children will soon be planting soybeans by the hectare as a field crop, instead of as a garden crop.

This is because the soybean is one of the *most useful plants in the whole world*. A kilo of soybeans has about the same food value as a kilo of meat, and takes the place of meat. But it has many other uses, among them the following:

It is rich in fat, and the oil factories will buy all that we can produce, to extract the oil.

After the oil is extracted, the meal is rich food for poultry, pigs, and other livestock.

The soybean is made into milk for children when there is not enough animal milk. It is the basis for making toyo sauce. It is also made into curds or cakes that can be eaten as meat.

The soybean is a legume, and its roots therefore make our land more fertile. The vines and leaves make good forage for our livestock.

The barrio farmers who have successfully grown soybeans call it the "miracle food," and say it is better and more profitable than mungo. If every SAMAKA farmer grows soybeans in his home garden, we will learn for ourselves how to grow it well and how valuable it is. We will then be able to decide whether we want to grow it for profit in our fields.

Time To Plant

In Central Luzon the farmers plant soybeans in the fields between September and January, and again in May and June. But in La Union province they are planted any time from May to December.

How To Plant

If we plant soybeans where they have not been grown before, we must first apply some inoculant to the seeds. This inoculant can be obtained by asking the help of the Agricultural Extension Man. *This is important!*

After our garden plot is prepared we make small furrows and drop the seeds in at intervals of 15 to 20 centimeters and cover by pressing the soil. Only fresh seed should be planted, as we have learned that if the seeds have been long in storage they may not germinate. It is best to use a soil where a bean or mungo crop was grown before.

How To Care For Soybeans

It is a good plan to cultivate the soil between the rows a couple of weeks after the soybean has come up. Then a week later we can hill up the rows with a hoe. If our land is acid we should apply some lime to our soybean plot to increase the yield.

Harvesting And Threshing

We harvest the soybean when the pods have turned yellow and have become dry. It is best for us to cut off the entire vine with a bolo, leaving the roots in the ground to enrich the soil.

The vines are thoroughly dried in the sun, and then threshed with bamboo beaters. The threshed seeds are then winnowed and again dried in the sun for about three days. After that they are stored in tight cans or jars. The dried vines are excellent food for our livestock.

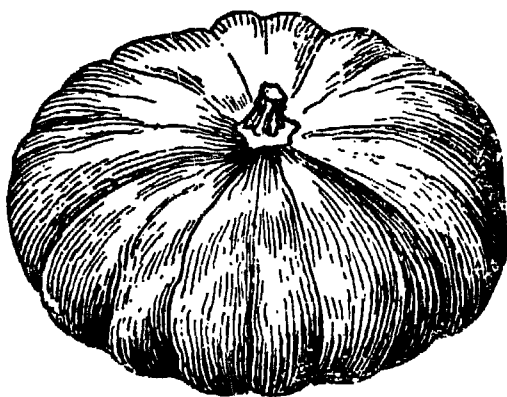
Kitchen Preparation

Soybean sprouts can be prepared in the same way as mungo sprouts. We can also pick the soybeans when fully grown but still green, and boil them in their pods with salted water.

The dried soybeans are often roasted and ground, and used as a tasty substitute for coffee or chocolate.

Many people like the soybean ground in grits and cooked like rice.

SQUASH



Depth to plant seeds: 3 centimeters.

Distance between rows: 1½ meters.

Distance apart in row: 1½ meters.

Time from planting seed to maturity: 4 months.

Squash takes so much space

that if our home garden is small we will not bother with squash, although we may plant a few hills in our nearby field.

Also we can save space by planting squash to grow on a trellis (balag), the same as upo.

Time To Plant

The farmers of Central Luzon plant squash in their fields during April, May and June, and again from September to February.

How To Plant

In preparing the ground for squash we dig a hole and place manure and compost 10 centimeters deep in the bottom. The hole is then filled with rich moist earth and the seeds are planted at a depth of 3 centimeters. We plant 3 or 4 seeds, and later thin them out, leaving the two strongest plants.

Care Of Squash

The squash needs enough water to keep the roots moist, but not too wet. Over-watering causes excessive leaves and less fruit. If the leaves become too many, we should pinch off the ends of the vines. Sometimes the first squash fruits rot and fail to mature. We cut these off with a sharp knife until more blossoms appear to assure fertilization of the blossoms.

Harvesting And Curing

Many of us harvest our squash before they are mature and lose some of the flavor and food value. When we harvest them we should leave 5 centimeters of the

stem, and dry them in the sun a couple of days, and then store them in a dry shady place, not touching each other, until the skin dries out. The squash will keep a long time when properly stored, increase our food supply, and furnish extra feed for our pigs.

Kitchen Preparation

Squash can be prepared by cutting into slices, either boiling it with salted water, adding shrimp, pieces of meat or roasted fish, preferably mud fish (dalag). It is also made into cake or pie. The tips and flowers are also good for "gulay."

SWEET POTATOES (Turn To CAMOTES)

TALINUM



This is an easy-to-grow green, with succulent leaves and tender stems, which became so popular during the recent war.

Depth to plant cuttings: 5 to 8 centimeters.

Distance between rows: 40 to 50 centimeters.

Distance apart in row: 20 to 30 centimeters.

Time from planting to first harvest: 2 or 3 weeks.

Why To Plant

Talinum is a wholesome vegetable, cooked or eaten raw. It grows

very quickly, is resistant to plant diseases and does not need much care. It is excellent green feed for chickens, rabbits, and pigs. It keeps growing all months, for several years.

How To Plant

The soil is loosened and prepared as for other vegetables. Cuttings of heavy stems 10 to 15 centimeters long are best. The leaves are cut off and the cutting is stuck in the ground 5 to 8 centimeters, and the earth pressed around it. It is then watered and in less than 2 weeks takes root and sends out new stems and leaves.

Harvesting

It is better to let the talinum plant reach a height of 30 centimeters before starting to harvest it. Then we cut off the stems back to the main stalk for our gulay, and new shoots will immediately start growing to replace them. If we want to eat the raw talinum it is better to pick the tender stems only.

Kitchen Preparation

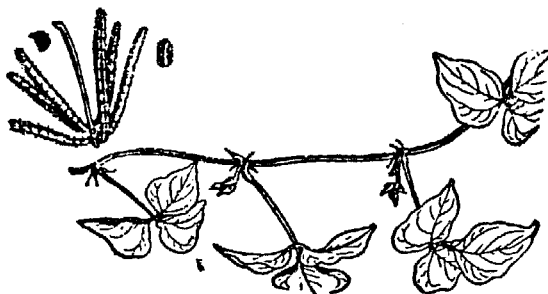
The best way to cook talinum is to steam it with very little water in a covered pot for a few minutes. Many people make the mistake of cooking it too long and that makes it mushy.

Raw talinum tips, mixed with chopped onions and some oil, vinegar and salt, make a delicious salad.

TAPILAN

Depth to plant seeds: 2 to 3 centimeters.

Distance between hills: 1 meter.
Time from planting seed to harvest: 120 days.



Why To Plant

Tapilan vines produce a bean which many like better than mungo. After harvest the vines can be cut, dried and stored as hay, to be used as livestock feed when other forage is not available.

Time To Plant

Tapilan is planted during both dry and wet seasons. Most farmers find May and June, and from September to February to be the best planting months.

How To Plant

The tapilan is planted in hills about 1 meter apart. When our lot is small we usually plant it along the fence or plant a long bamboo stake to support the vine.

The soil should be pulverized to a depth of about 30 centimeters where the seeds are planted.

TOMATOES

Depth to plant seed: 1 centimeter.

Distance between rows: 60 to 80 centimeters.

Time from seed planting to maturity: 90 to 100 days.

Varieties: Native Marikina;

Ponderosa; Marglobe; John Baer; Pearson; Pearl Harbor.

Why To Plant

The tomato ranks as the most important vegetable for the home garden. It is easy to grow, easy to use, rich in food value, and very pleasing to the taste. It succeeds in all types of soil. All it needs, in addition to our loving care, is ordinary soil, enough water, and plenty of sun.



How To Plant

Tomatoes are so important to our home garden that we should be willing to take more trouble to get satisfactory results. When we plant tomatoes in our field to produce for the market we do not spend so much time and labor. Most of us have found that for the home garden, we get the best results by transplanting two times. First, we sow the seeds in the seed box. After the plants are 3 to 5 centimeters high we transfer them to a second seed box in regular rows, about 10 centimeters apart, where we let them grow to a height of 15 to 20 centimeters. Then we take a trowel or a wide board, and transplant them to our tomato plot. That is a lot of work, but it pays us in good results.

When we make the second transplanting, we are very careful not to disturb the roots. Some of us separate the second seed box into sections separated by paper or banana leaves, so that we can take out the complete ball of earth without disturbing the roots.

When we are ready to transplant these plants to the tomato plot, we make a hole the size of the section of earth with the seedling which we are transferring to the plot.

Tomato Trellis

Some varieties of tomato form sturdy bushes. The branches of other varieties lie on the ground, and should be supported by low bamboo trellises to keep the fruits from contact with the soil.

Irrigation

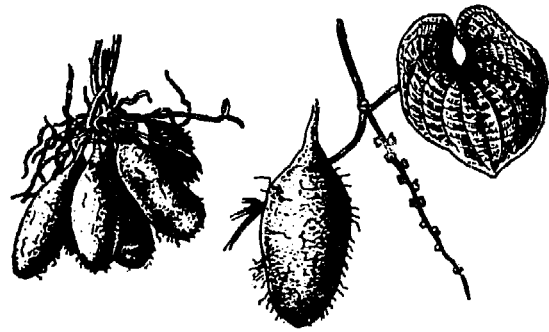
The experts tell us different stories about how much water we should give our tomato plants. We will have to learn from our own experience how much water we have to give our tomato plants according to the conditions in our own garden. We know that the roots of the tomato will go as deep as 2 meters and spread out 1 meter on every side. If the soil is moist, we do not have to irrigate the plants often. If the ground is moist when we plant the tomatoes, we can keep the moisture from drying out fast by covering the tomato plot with a thick mulch of grass, straw or leaves.

Pruning

When the tomato plant sends out too many branches and suck-

ers, it is best to cut them off. This will make the remaining branches give more fruits. This should be done while the branches are young and tender.

TUGUI



Depth to plant: 15 centimeters or more, but put just enough soil to cover the tuber.

Distance between rows: 1 meter.

Distance apart in row: 75 centimeters.

Time from planting seed to maturity: 200 to 250 days.

Why To Plant

The tugui is a root plant which is easy to grow in any well-drained fertile soil, and furnishes a palatable substitute for rice, corn, and camotes.

How To Plant

Tugui can be planted any time of the year, but grows best when planted early in the rainy season, as it needs plenty of moisture.

It is grown from pieces of the root or tuber. The seed roots are planted in seed beds. When the eyes have sprouted, the root is cut into pieces with 2 or 3 eyes to a piece, which are planted in the prepared field. For each plant we

need a bamboo pole 2 meters high for the vines to climb upon.

Harvesting And Storage

In harvesting the tugui we are careful not to cut the roots with our spade. We can store the roots for several months in a well ventilated place, using a loosely woven bamboo basket. It is bad to wash the tubers which we are going to store.

Kitchen Preparation

The tugui is boiled and served like potatoes or camotes. It is also used for the preparation of sweets, calamay, and other delicacies.

UBI



Depth to plant seed tubers: Until covered.

Distance between hills: 1 meter.

Time from planting to harvest: 10 months.

Varieties: Although there are several varieties of ube, the kind most favored is the one with the purple roots.

Why To Plant

The ube produces abundantly and furnishes a nourishing food. Its leaves are very decorative, and

most farmers plant it in their garden so the vine can grow on a trellis or fence.

Time To Plant

Most farmers plant the ube in May and June, although in Pampanga and Pangasinan it is planted usually in October, November and December. However, if we have a good supply of garden water we can plant ube any time.

How To Plant

To get the best results we need a rich soil, which should be prepared by pulverizing the soil to a depth of 25 centimeters in a circle 1 meter wide. We cut the ube into sections, each containing 2 or 3 eyes or buds.

Harvesting

The ube is ready for harvest when the leaves become dry. We should dig up the large roots carefully so as not to cut them. After harvesting we store the ube in a well ventilated place under a shed or in the kitchen until they are dry. When dry the ube will keep well for several months.

Kitchen Preparation

Most of us use the ube for making sweets or halo-halo. But it can be cut into square pieces and used as a vegetable or as a substitute for potatoes.

UPO

Why To Plant

The upo is widely grown and liked in our country so that no home garden should be without it.



Where To Plant

As it needs a trellis for the long vines, we can make a bamboo trellis in our yard, and get shade under it for our lettuce and other shade-loving vegetables in the hot season. To save space we can also plant it next to our back porch where the vine can be supported by a trellis or the roof.

How To Plant

We will get a very much better yield from our upo if we mix plenty of well-rotted manure or compost with the soil where we plant it. Usually, we plant two or three seeds to a hill. In some places the tender leaves of the upo are used as a vegetable.

HERBS FOR FLAVORING

Every SAMAKA garden should have a small plot of flavoring herbs for the wife to use in her cooking. In addition to garlic and onions, which we plant in our main vegetable garden, it is good to have ginger, anise, kutchai, peppermint, tsile pepper, parsley, pandan, kin-chai, and lemon grass.

Many other herbs may be added, according to our individual tastes.

MUSHROOMS

Many of us have heard about the growing interest in raising mushrooms. It does not take much space, so it is suitable for a home garden.

All we need is surplus rice straw for the mushroom beds. Some of us have found waterlilies equally suitable.

It is not hard to raise mushrooms. We pile the rice straw, in bundles, in a bed 80 centimeters wide, 25 centimeters high, and as long as we wish. We dig a drainage ditch around the sides, using the excavated earth for a raised foundation for the rice straw bed.

The mushroom spawn, or seed, is planted as we build up the mushroom bed with bundles of rice straw. With regular watering the



mushrooms will begin to appear in about a week. We can start harvesting every week for two or three months.

(Please refer to page 169 for complete information on this subject.)



Every SAMAKA farmer would like to have plenty of fruit trees in his home garden, but too often he plants only a few bananas and perhaps some papayas. Maybe some of us do not have other fruits, because we do not like to plant trees that will not give us fruit for 3 to 6 years.

But consider how happy we would be today if we had planted many different trees in our home garden when we first occupied the place many years ago.

Some of us are tenant farmers, and we did not plant fruit trees because maybe we would leave the land before the trees gave fruit. We did not see any good reason to plant trees just to improve the land owned by someone else.

Yet the SAMAKA way of life is to make the fullest use of the land, so that the land and the person living on it are partners helping each other. And what if we move from the land before we enjoy the fruits of the trees we plant? The tenant who succeeds us will bless our name. And if other SAMAKA

farmers have done the same, we may move to a farm where trees have been planted by the man before us.

Now that we have decided to increase our fruit production, how do we start?

Kinds Of Fruit Trees

First we must decide how many fruit trees we can plant on our small home lot, and then what kinds. We have to leave space for the vegetable garden. If we have a home lot of 2,000 sq. m., there is room for a big vegetable garden, and a yard for our pigs, chickens and other livestock. Most of us have lots of only 400 to 600 square meters. So we must reduce our tree planting to leave enough room for our vegetable garden, our pigs, and our poultry.

The following fruit trees should be in every home garden. If we have a large enough lot the following are good trees for the home garden:

Banana
Papaya

Nangka
or rimas

Malungay	Avocado
Santol	Chico
Kalamansi	Orange
Guayabano	or pomelo
or atis	Kaimito

These trees are important for their food value and should form a part of every family's diet to maintain good health.

Other trees, such as sampalok and duhat, are very popular, but are not so important a food as bananas and papayas. If our neighbor on one side plants santol and the neighbor on the other side plants a sampalok tree, then we could plant a duhat tree. The three of us can then trade the fruits from these trees with each other.

If our home lot is big enough, then we should also have one or two mango trees, because in time they will add to our earnings. But if our lot is too small, a mango tree will not leave enough room for the fruit trees we need for the family food.

Irrigation Of Trees

As this book tells about farming in places where there is a long dry season, we must consider water for our fruit trees. So we should examine our ground water, to see how deep is the damp earth in the dry season. If our ground is somewhat moist at a depth of less than 1 meter, that is enough to give water to the roots even in the dry season. If the ground a meter deep is dry, then we may have to water the trees during the dry season.

Recently a way of keeping fruit trees watered has been found

which does not require labor. A farmer in Los Baños with his trees on a high place without water now keeps his trees irrigated by planting bananas close to his fruit trees. The banana stalk stores so much water during the rainy season that it feeds plenty of moisture to the roots of its neighboring fruit tree even in March and April when there is no rain. All of us have often noticed that even when the grass in the fields is dry, green weeds continue to grow near the banana stalk, because it stores water. This method has been tested for many years by one farmer and proved very successful. We may want to try it for one or two trees first, to see if we get equally good results.

Another way to keep our fruit trees supplied with water is to surround the trunk with a pile of mulch, made of grass, leaves, straw, or other vegetable matter, or with compost from our compost pile. This helps to keep the ground from getting dry from the heat of the sun. After a few months it gets rotted and becomes fertilizer, which feeds the roots of our trees.

Where To Get Our Trees

We can start our fruit garden from seeds, but this is good only for trees which do not show much difference in quality, such as the kalamansi. In most cases it is better to plant parts of fruit trees which have been observed to be producing a good quantity and quality of fruit. Often we can get the planting material from our

neighbors. Otherwise we should ask for budded or grafted small growing plants from the municipal or provincial nursery.

Now let us discuss the different ways of starting our SAMAKA fruit garden as other farmers have done.

Planting Directions For Fruit Trees

Planting from seeds.—We plant the seeds of the selected fruit in a box until they are 10 to 20 centimeters high. Then we transplant them carefully into a prepared growing plot until they are as high as our knees or hips ($\frac{1}{2}$ to 1 meter). Then they are ready for planting in the permanent places we have selected. For each seedling ready for final transplanting we dig a hole in our garden about 30 centimeters deep. We remove the small plant gently from the growing plot without damaging the roots, and place it in the hole. We surround the roots with rich powdered earth and pack it well. Then we place grass, leaves, or straw around it, one hand high, to keep the ground from getting too dry.

The best time for us to transplant is early in the rainy season.

One or two months later we can plant a banana about 30 centimeters from the small tree, to give temporary shade and perhaps moisture to its roots in the dry season.

The above directions are good for the trees listed below. After the names of the trees are shown the distances they should be plant-

ed from other trees, except the banana companion:

Lime (Dayap)	
and Kalamansi	3 to 4 meters
Nangka and Ri-	
mas	10 to 15 meters
Avocado	10 meters
Chico	10 meters
Orange and Pom-	
elo	6 to 10 meters
Kaimito (Star	
Apple)	10 to 15 meters
Guayabano and	
Atis	5 to 10 meters

Nursery trees.—Many times we can get fruit trees to plant from the municipal or provincial nursery. This is very good if we can get them, because such trees will give fruit sooner. Also, the nursery trees are budded or grafted, which gives selected quality and earlier production of fruits.

The following fruit trees are recommended to be planted from grafted or budded nursery stock, instead of using our own seedlings: Orange, Pomelo, Kaimito, and Mango.

Marcotting. — Marcotting, also called layering, is what we farmers do when we want to get exactly the same kind of fruit that grows on some other fruit-bearing tree. Instead of planting a seed, we plant a branch from the tree.

But before cutting the branch, it is necessary to *marcot*. We do this by removing the bark from around the selected branch for a width of 4 to 6 centimeters, and covering this place with a plaster of heavy clay soil, which we hold in place by wrapping it with co-

conut husks, or cabonegro fiber. If we keep it moist, roots will soon grow above the stem where we cut away the bark. After many of the roots have grown through the fiber or husk, we saw the branch below the new roots, and then we plant the branch in a pot until it is growing vigorously. Then we transfer it to our garden, just like planting a small seedling tree. The branches which we marcot should be 1 to 3 centimeters thick. The pictures here show how to marcot a branch (Fig. 38).

Some of the trees and shrubs which can be easily marcotted are orange, pomelo, santol, star apple (kaimito), tamarind (sampilok), guava, chico and makopa.

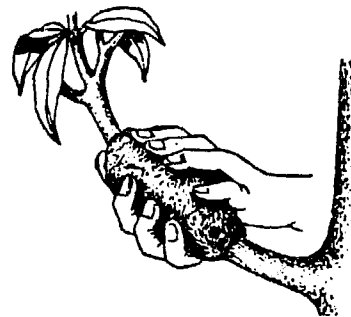
Pointers On Marcotting

1. The best time to start a marcot is during April and May, just before the start of the rainy season.
2. In removing the bark of the branch, do not cut deep, only the thickness of the bark is best, but be sure to get all the bark off or new bark will grow instead of roots.
3. Marcot only from a tree which we are sure is healthy and gives plenty of good fruits.
4. Select healthy branches.
5. Do not make the marcot branch too long — about 1 to 2 meters is usually the best.
6. It takes from 3 to 10 months

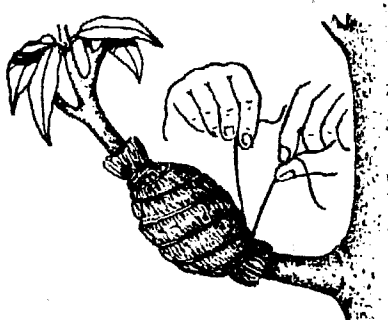
Fig. 38



We select a branch 1 to 3 cm. thick and completely remove a ring of bark around it for a length of 4 to 6 cm. just below a node or joint swelling. Don't cut too deep but remove all bark.



The cut portion is then covered with a plaster of heavy claysoil, not rich humus soil. The clay should be slightly moist.



The clay is held in place by wrapping it with coco husks or cabonegro fiber and tie it with string.



In 3 to 10 months small roots will come through and we trim off half the leaves. Then we cut off the branch from the tree and plant it in a pot. After new leaves begin to appear we can plant the tree in our garden.

before the roots of the marcot are big enough to cut and plant the branch.

7. Do not forget to water the marcot every other day when there is no rain.

Care Of New Trees

When we have planted fruit trees in our home garden our task is not finished. If we have live-stock we must protect the young trees from the animals that like to eat their leaves. The easiest way to do is to place strong sticks around the tree, with a fence of woven bamboo twigs or other material which will not keep out the sunlight.

When the tree is small we ought to keep it watered in the dry season, as the roots do not go deep enough to suck the moisture from the deep earth. If we have placed a thick mulch around the trunk, heavy watering every 10 days in dry weather is better than daily watering.

During the first year we should add animal manure or compost to the mulch around the trunk.

Diseases Of Fruit Trees

There are so many kinds of diseases and pests which attack fruit trees that we will be confused if we try to learn about all of them.

But one thing that successful farmers have learned is this. If we have healthy trees, well cared for as described here, very few diseases will attack our trees. If they do, it is better to call the Agricultural Extension Man for his help, which is furnished free.

For insect pests, we should have a cheap spray and spread DDT or chlordane on the tree. We need spray for our vegetable garden, and the same spray can be used for our small trees. If the mulch becomes the breeding place of pests, we can spray the mulch also.

Bananas

The planting of bananas is so well understood by all of us that there is not much new to say. But if we want our bananas to give us the greatest happiness, we should plant several varieties. In that way we will not get tired of eating the same kind of bananas day after day. For a SAMAKA farm of 1,000 square meters, we can easily have 20 banana plants without crowding, including the ones next to our fruit trees.

The following varieties are recommended as good for cooking and eating fresh, and which produce much fruit:

Latundan Bungulan Saba
Lakatan Inarnibal Catungal

We cannot have too many bananas in a SAMAKA garden, because what we do not eat make rich and cheap food for the pigs and chickens. The banana is such a rich food that people have been able to live on nothing but bananas for months at a time.

Farmers who have been especially successful in growing bananas in Central Luzon recommended the following practices which some of us may not yet have heard about:

1. Do not pick the bananas too

soon before they are ripe. When picked too green, even when they ripen in the house they do not have such a good flavor.

2. When the banana hill produces many suckers, it is best to cut out some of them by removing the growing point, so as to reduce the number to 5 or 6 in each hill. If there are too many stalks crowded in one hill they will give small fruits or maybe none at all.

3. Like other plants, bananas do best when fertilizer is added to the soil.

Papayas

Papayas are easier to grow than bananas. The only trouble with papayas is that their seed gets mixed with the seed of neighboring trees very easily. Therefore, we find that the seed from a very tasty papaya fruit does not always produce a plant which gives the same kind of fruits as the parent. It is, therefore, a good idea for all the SAMAKA farmers in a barrio to plant the same kind of papaya, so they will be more uniform in quality.

Papayas should be cut down when they are about four years old, or when their production of fruit declines, as they do not give enough fruit to pay for the space they occupy. We can plant a few new papayas each year to replace the soil.

Papaya trees do not withstand continuous flooding.

Ground Fruits

Other fruits which the SAMAKA farmer wants in his garden

do not grow on trees, but on low plants near the ground. These include pineapple, watermelon, and muskmelon. If we want to grow these things we can turn to the chapter about vegetables, which tells about these vegetable fruits.

Coffee And Cacao

In addition to the trees which produce fresh fruit, it will be profitable for us to plant some coffee and cacao trees in our garden. About six trees of coffee and the same number of cacao will give us a generous supply of coffee and chocolate for our table.

For the home garden we can plant both our coffee and cacao trees fairly close together. A distance of $2\frac{1}{2}$ meters each way is satisfactory. Another advantage is that both of these trees need partial shade, so we can plant them next to our bananas or under our fruit trees, or next to our kaka-wati fence.

We often hear that coffee and cacao grow well only in the highlands, such as Lipa, Tagaytay, Baguio and Bukidnon. Many of us have grown coffee and cacao in the lowlands, but we have learned that the land must be elevated above the floods. In other words, the roots of these trees cannot tolerate standing water, so we plant them on slopes or slight rises and provide good root drainage.

This same need for root drainage is found in the case of other fruit trees, especially oranges.

Rewards Of Fruit Trees

With a few fruit trees in our

garden we will soon be enjoying the taste of many luscious fruits on our family table. Fresh fruits are not only pleasant to eat. They are also necessary for health and strength of body. They have in them vitamins and minerals which the body needs. So every SAMAKA farmer should start his fruit trees *this year*.

A Communal Tree Planting Center Helps SAMAKA Farmers

We can get fruit trees for our home garden from the Provincial Nursery. Some towns have municipal nurseries. The Agricultural Extension Man will also help us get these small trees to plant in our garden.

But there is a much more convenient way to do this. Each SAMAKA farmer may not be ready at the same time to plant fruit trees, and this will mean many extra trips, or long waiting for the time when the Agricultural Extension Man can come.

In some barrios the farmers have already established their own nursery or planting center. If we can get some landowner in our barrio to lend us a small parcel of land, it is easy to have our own SAMAKA plant propagation center. About 2,000 square meters of land is enough, and it does not have to be the best quality of land. In many barrios the big landowners have been willing to allow the people to use a parcel for communal use for raising fruit trees for distribution. We should get the right to use the land for not less than 5 years. By that time

all of us should be able to have our own fruit orchards planted. The land can be returned to the owner then, with a few large fruit trees already growing there for his own use, which will be his reward for letting us use the land.

When we get the land for our planting center, we should build a strong fence around it to protect it from roaming animals. Then we should build a small shed to store tools and equipment. Unless the land adjoins the house of a SAMAKA farmer who will guard it, the shed should have one sleeping room.

We also need a water supply. In most places a well 2 or 3 meters deep can be dug, which will give enough water to irrigate the small trees.

We should get the advice of the Agricultural Extension Man as to how the land should be prepared. We do not want to cut down shrubs and trees that are there, because they are needed for shade. We should also plant kakawati, ipil-ipil, katuray, kapok, or malungay along the fence to give additional shade.

When we have the lot ready, the one in charge of the nearest provincial or municipal nursery will be able to supply us with an assortment of trees and seeds. We should try to get some trees large enough to provide budding and grafting stock, in addition to small seedlings.

All of us who have good fruit trees already should save the seeds from our fruits so that the planting center can provide us with

more seedlings, which can be budded or grafted later.

When some of our neighbors have good trees that we need more of, the branches can be marcotted and later transferred to the nursery to be cared for until they are needed for our gardens.

We should have as many different kinds of bananas in our nursery as we can find, so as to have a large supply of suckers for distribution to our home gardens.

Also it is wise to plant a few papayas of the best variety, so that in time all of the farmers can get the seeds and grow the same choice variety.

The Secretary of Agriculture and Natural Resources has issued orders that when the people of a barrio start their own plant nursery, all agricultural agencies will give special help, such as tree planting material, special seeds and other help. The expert in fruit trees will be sent to teach us the art of budding, grafting,

marcotted, and inarching fruit plants. Also we will receive more frequent visits from the Agricultural Extension Man, to help us make our planting center a success. He will see that a trained man comes to supervise the budding and grafting of the seedlings at the proper time.

Who will manage our plant nursery? It will be a community project, so all of the SAMAKA farmers will contribute their labor and help. But one of us will have to be in charge as Assistant Leader. We cannot afford to pay a salary to the in-charge. But we can allow him to sell all the papayas, bananas and other fruits from the planting center as a part reward for his public service to us.

Once we have established our planting center, we may be able to get special plants to grow there for future distribution, especially flowering trees and shrubs which we lack in our barrio.

Flowers Are Needed In Every Garden

We barrio farmers are proud men. Even if poor, we SAMAKA farmers want our children to appear neat and clean. We try to have one handsome set of clothing to wear on special occasions. We try to make our house as attractive as we can afford.

All of us like beautiful things, either to adorn our body or our home. The cheapest and most satisfying kind of beauty we can add to our SAMAKA garden is flowers. Maybe we cannot eat or sell beautiful flowers. But a few flowers adorning our home add richly

to the joy of life. It gives to us the joy of seeing, and it also gives pleasure to our admiring neighbors, and in this way satisfies our own natural pride. It is therefore good to plant a few flowers in every SAMAKA garden for the joy they bring us.

If we SAMAKA farmers of a barrio all raise flowers we will also save money. When fiesta time comes we do not have to buy expensive flags and strips of colored paper to string above the streets. Instead we can string vines mixed with flowers of many colors. We will also have plenty of flowers to make garlands for the people marching in the procession.

Flowers are much more beautiful than artificial imported decorations. If at fiesta time our visitors discover all the houses and streets decorated with fresh flowers of many colors, they will be amazed and delighted, and the fame of our barrio will be carried to many other towns.

Some Good Flowers To Grow

In order to have plenty of flowers for the fiesta, we want the kinds which stay fresh a long time, the same kinds that are used for wreaths. Also we want plenty of green material for streamers.

Among the flowers which are easy to raise and do not take too much space and which stay fresh all day are the following:

Gardenia (rosal)	Kamia
Sampaguita	Cosmos
Yellow trumpet (campanilla)	
Canna (tikas, bandera española)	
Sunflower (mirasol)	Lily
Santan	Zinnia

If many people in the barrio plant just a few of these flowers, there will be plenty for decorations when fiesta time and All Saints' Day come.

For making green streamers, each town has many kinds of suitable plants and vines. We always have bamboo, and in most places we can find kamuning, balete, papua, agoho, pitogo, and bougainvillea.

In addition to the flowers we will gather, we would also like to have some in the garden just to make it beautiful, such as hibiscus (gumamela), bougainvillea, San Francisco, rainflower (kulug), and amaranth (butonisan). For our window pots, there are many beautiful plants, such as kamantigue, begonia, petunia, daisies, suerte, bitones-bitonisan, mil flores, gladiolus, chichiricas, ferns, and lilies.

The Family Chicken Cage

A New Kind of Home Poultry Project

As the family increases in size and the children get older our thoughts turn to raising part of our food, in order to make our money go farther. We usually start with a garden. We plant vegetables, bananas, and papayas. Later we decide to raise a few chickens.

Often we become discouraged about poultry. Perhaps we tried it, and our small flock of chickens may have all died from some epidemic disease. Maybe our chickens roamed around the neighborhood and were lost. Or perhaps our flock escaped into the vegetable garden and uprooted the plants and ate the tender seedlings.

By raising poultry in the Family Chicken Cage we can avoid these misfortunes. With the Family Chicken Cage method we do not have to fear that our chickens are going to wander off, or be stolen, or destroy our garden. We need not fear they will die off suddenly from contagious disease.

These fears have kept many people from starting or continuing with a "backyard" poultry project. The "backyard" project has now become somewhat obsolete for the family raising chickens for its own use. The Family Chicken Cage is taking the place of the backyard poultry project, and giving us confidence that we can profitably

and conveniently raise chickens for eating and for egg-laying, with little risk of loss.

As a matter of fact, if we use the new and tested methods of chicken raising we can start raising chickens even before we plant the vegetable garden. This is so because many of us in the populous towns lack yard space for a garden. Also a good garden needs good soil, plenty of water for irrigation, and considerable knowledge of the cultivation practices required for each vegetable. Those of us who have tried both chickens and vegetables find that we gain more in the form of *abundant food* and *savings of market expenses*, from raising chickens than from having a vegetable garden. A garden is a fine thing to have, because every family needs plenty of fresh vegetables for better health. But many of us should start with chickens, and later establish our vegetable and fruit garden. Once our chicken project is going well we will have plenty of chicken manure for our vegetable garden.

People who live in the large towns do not often have chickens on their tables nowadays, except for special occasions. Why? Because chickens are not as cheap as they used to be. Many families do not get enough eggs to satisfy

their appetite for this nutritious food. But if we establish a Family Chicken Cage, the meat and eggs from our chickens are among our **cheapest foods**, which our family can enjoy *several times a week*. In this way we save market expenses and improve the health of the entire family because of this better nutrition.

Many books have been written to tell us how to keep chickens in our backyard. The first edition of "The SAMAKA Guide" had a chapter giving full instructions on how the barrio farmer can raise more and better chickens and eggs for the family table.

But the barrio farmer has a large garden for his chicken yard, and he has a farm from which he can get rice bran (darak), or corn, and other things to feed his chickens.

How about the town people, who do not live on a farm? Many of us in the large *poblaciones* and cities have very small lots, crowded with houses, or we may live in a rented *accesoria*, apartment or *entresuelo*. Can we then raise chickens profitably?

The answer is yes.

Even if we have no garden, even if our lot is small, even if we live in the crowded city, most of us can produce cheaply, *right in our homes*, the chickens and eggs we need for our family food.

The reason why we can now raise chickens, without a large yard, is because the scientists have learned just what kind of chicken feed the chickens should eat, in or-

der to grow fast at the least expense, and what kind of feed we should give to laying hens to produce the most eggs. This will reduce the cost of the chickens and eggs we eat. We can start right in our homes, if we are willing to work 20 to 30 minutes a day managing the Family Chicken Cage.

Raising Chickens in Cages

We have now learned that chickens do not need a chicken yard. Each year more and more people who raise chickens for the market are producing chickens and eggs in large indoor cages. They give the chickens exactly the kind of feed they need. The chickens take it easy, instead of wasting their energy scratching in the fields. This way they grow faster and lay more eggs. We used to think that in order to be healthy the chickens must have sunlight. We have now learned that if the chicken feed we give them contains the right kind of vitamins, even sunlight is not needed. The chickens do not need much exercise, either. If they have the right kind of feed, their lazy way of life in cages makes them grow fast, yet their muscles and meat remain tender, and when we eat the chicken meat we are delighted to find it so juicy and delicious.

Today we can buy these specially prepared chicken feeds, that come in sacks. The prices are reasonable because the feeds are made in Philippine factories. The feeds contain every substance needed for the chicken's health and growth. The money we have been spending

in the past for eggs and chickens to eat at home will give us twice as many eggs and chickens if we spend the same amount of money to buy these special scientific chicken feeds, and feed the same to our own small flock of chickens.

So if we are willing to work 30 minutes a day caring for our Family Chicken Cage, we can enjoy abundant chicken meat and eggs at a price we can afford.

Family Chicken Cage

What we call the Family Chicken Cage is suitable for townspeople who have an open space of only 2 by 3 meters or 6 square meters in the yard, the patio, the *zaguan* (basement), the garage, or even on a porch or azotea. It is equally suitable for the homesite of the farmer, who can keep the Family Chicken Cage under the house, in a shed, or under a grass shelter in his yard.

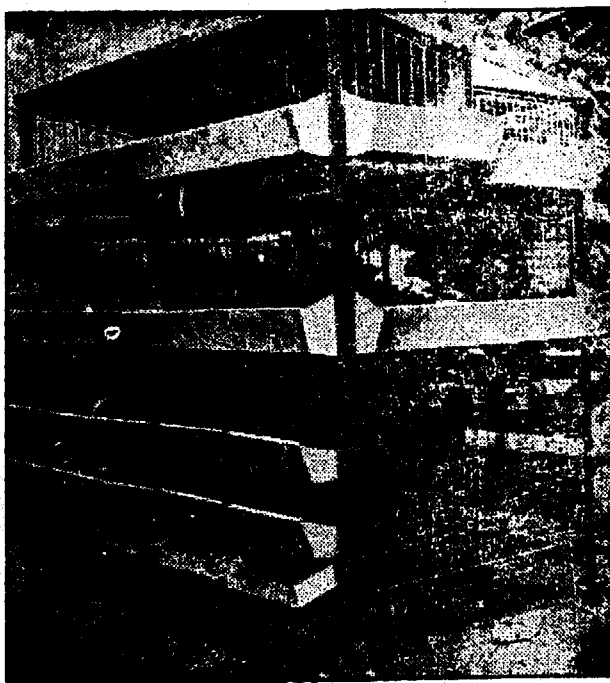


Fig. 39. Factory-made Family Chicken Cage, of steel frame and iron grills.

The plan calls for starting our project with 25 baby chicks, and each month we add 25 more chicks.

The Family Chicken Cage is small enough for the teenage children to manage, yet big enough to supply our household with five or six large size eggs daily, and 250 chickens each year for frying or for our adobo. (Fig. 39).

Operating Expenses

The big fresh eggs we raise this way will then cost us about 8 to 9 centavos each and our broilers, weighing 1 kilo, will cost us only ₱1.30 to ₱1.50 each, or half the price we have to pay in the city markets. If we should sell half of our 250 chickens each year to our friends and neighbors, the money we receive would pay for *all the feed we buy and the cost of the baby chicks*, so we would get the eggs and chickens we eat without cost.

Let us have a little arithmetic on the cost of producing these delicious chickens. We can buy male baby chicks of the dual purpose type at about 25 centavos each. If we get male and female chicks mixed (straight run), they will cost 45 or 50 centavos each. The broiler type chicks will be ready for our table when they are about two months old (60-62 days). They will then weigh about 1 kilo. During those two months each of the 25 chickens will eat 2.7 kilos of prepared well-balanced chicken feed costing (at 30 centavos per kilo) ₱0.81. That gives us a cost as follows: baby chicks, straight run, at 45 centavos each;

chicken feed worth ₱0.81 for each chicken, or a total of ₱1.26 for each 1 kilo chicken.

Each of our laying hens should produce *not less* than 130 eggs a year. Each hen will eat during the year 36 kilos of feed, which at 30 centavos a kilo costs ₱10.80. So our 130 large-size eggs will cost us ₱10.80, divided by 130, or about 8 centavos each. And, of course, after the hens have been laying eggs for a year or so, we can gradually start eating the large hens, replacing them with new laying hens. The hens start laying when they are 5 ½ to 6 months old. At first the eggs are small and few, but as the chickens get older the eggs increase in size and number.

Special Points On Operating The Family Chicken Cage

If we raise chickens in a Family Chicken Cage, the following points are important to remember:

1. It is not worthwhile for us to hatch eggs laid by our hens at home. It is more convenient to buy selected baby chicks one day old from people in the business of producing chicks for sale. There are now several of these reliable hatcheries. In that way we can eliminate the rooster, and avoid complaints from neighbors. We should remember that roosters do not cause hens to lay eggs; they only *fertilize* eggs. The hen will lay just as many eggs, even without a rooster.

2. We should buy only the best breed or variety of chicks, which have tasty flesh and which lay many eggs. This kind is called a

dual-purpose chicken. That is, the layers lay many eggs, and the chickens we eat have plenty of meat of good flavor.

3. We should use only feed of good quality, bought from a very responsible manufacturer who has a testing laboratory and guarantees his feeds.

4. It is convenient to start with 25 chicks, and add 25 more every month, so we will soon have a continuous supply of chickens ready for the dinner table.

5. We should accumulate the dry chicken manure (a paper sack will do) and sell it as fertilizer to someone with a garden or use it in our own garden, if we have one. The chicken manure from a Family Chicken Cage is all the fertilizer we need for a garden of 1,000 square meters.

What We Should Know About Chicken Raising

To operate a Family Chicken Cage we do not have to be poultry experts. Our chickens will be confined in the cage, so they will be fairly safe from the contagious diseases so often carried from the sick chickens of our neighbors. If, as here recommended, we buy our 1-day-old chicks from a reliable commercial breeder who operates a hatchery, we do not have to learn about hatching chicks from eggs. All we have to do is give our chickens sufficient feed and water and keep the cages clean. The chickens do not need sunlight or grass. The special feeds of today provide all that the chickens need. The chickens we

raise for cooking will grow fast and be tasty. The female chickens we keep for egg-laying will go on laying regularly without a noisy rooster, since a rooster is needed only when we wish to make the eggs fertile for hatching. Since we have no rooster, our neighbors will not complain of being awakened by its crowing.

But everyone who decides to operate a Family Chicken Cage will want to know many details and what are the chances of success. So we are setting down the experience of some of us who have succeeded with this method of raising chickens for home consumption. The following topics will be discussed:

1. Buying or Making a Family Chicken Cage.
2. Selecting Our Baby Chicks.
3. Poultry Feeds.
4. Managing the Chicken Cage.

Buying Or Making A Family Chicken Cage

Metal chicken cages are made in shops specializing in this kind of business. If we are handy with tools we can make our own Family Chicken Cage, using bamboo, wood, or wood and poultry netting.

"Brooder" cages for chicks raised in incubators are regular hatchery equipment. "Broiler batteries" have long been made for the use of commercial poultry farms, and "laying cages" for poultrymen who supply the egg market. These



A Girl Caring for Family Chicken Cage

Fig. 40. Family Chicken Cage made of bamboo.

pieces of equipment are made of metal frame, wiring, and sheets, and are very satisfactory. But they are intended for the chicken-raising *business*, not for the family raising chickens for home consumption.

So we have designed a new kind of equipment called the "Family Chicken Cage" which is a combination of brooder, broiler battery, and laying cage.

For over three years now the procedures described in this book have been *successfully carried out* by several families in Manila and nearby towns who have used these inexpensive Family Chicken Cages made of bamboo. (Fig. 40). Others, being made of imported materials, have cost several hundred pesos.

But why use imported materials when we can make an equally useful Family Chicken Cage of local materials? So that is what we have done: We have made them with bamboo framing, floors, and an asbestos or galvanized iron top. The only metal parts used are the dropping pans to catch the manure, the rat guards, and a few nails. (Fig. 40). Another model is made with wood frame and chicken wire. (Fig. 41). Some farmers in Bulacan are now making these cages as a home industry. They sell them for ₱50.00 to ₱100.00. Trade school students or anyone with ordinary skill in bamboo craft should be able to make his own Family Chicken Cage.

We are therefore giving detailed plans and pictures of "How to

Make a Family Chicken Cage" to help you.

Description Of Family Chicken Cage

The Family Chicken Cage, as we see from the illustrations, is a cage of three decks, or floors, one above the other. It is 2 meters (6 ft. 7 in.) high, 117 cm. (36 in.) wide, and 1.65 m. (5 ft.) long. (See Figs. 45, 46 and 47).

The top deck is divided into two sections, the Brooder where the baby chicks are first placed, and the Live Storage Unit, where we keep some of the chickens which have grown to frying size until we are ready to eat them.

The Brooder has an inclosed portion, where the baby chicks can be protected from cold winds, and keep warm by crowding together; and an open Brooder Range where they can move around.

The middle deck is the growing unit to which we transfer the chicks after 4 to 5 weeks, and where we raise them to eating size.

The bottom deck is divided into 10 cages, each big enough to hold a large laying hen, with a floor sloping down so that eggs will roll into a receiving tray.

Under each deck is a galvanized iron Droppings Pan, where the manure (droppings) of the chickens, that falls through the poultry netting or bamboo floor, is deposited.

The bottom floor is 30 cm. (1 ft.) above the ground, to keep rats out of the cage. A rat guard of metal is attached to each leg. (Fig. 41 and 45).

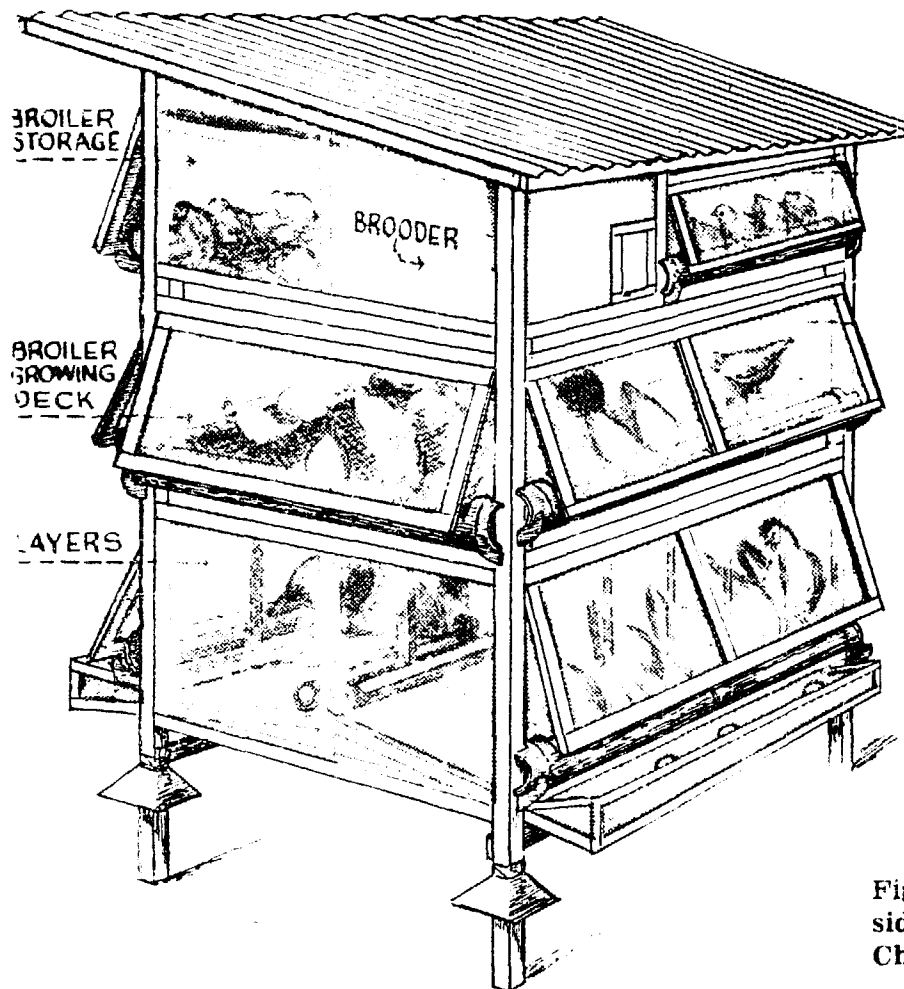


Fig. 41. Family Chicken Cage made with wood frame and chicken wire.

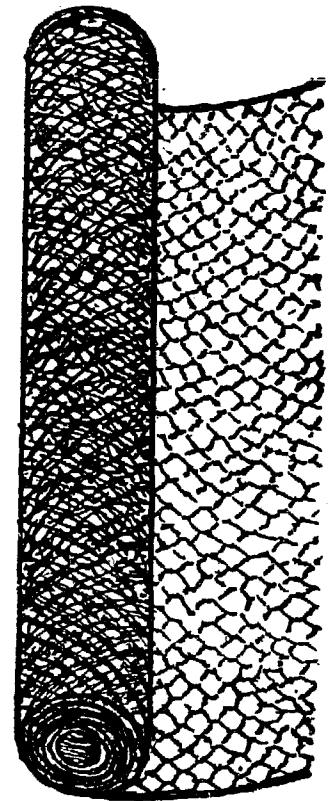


Fig. 43. Poultry wire for sides and floors of Family Chicken Cage.



Fig. 42. Bamboo joints make excellent containers for chicken feed and water.

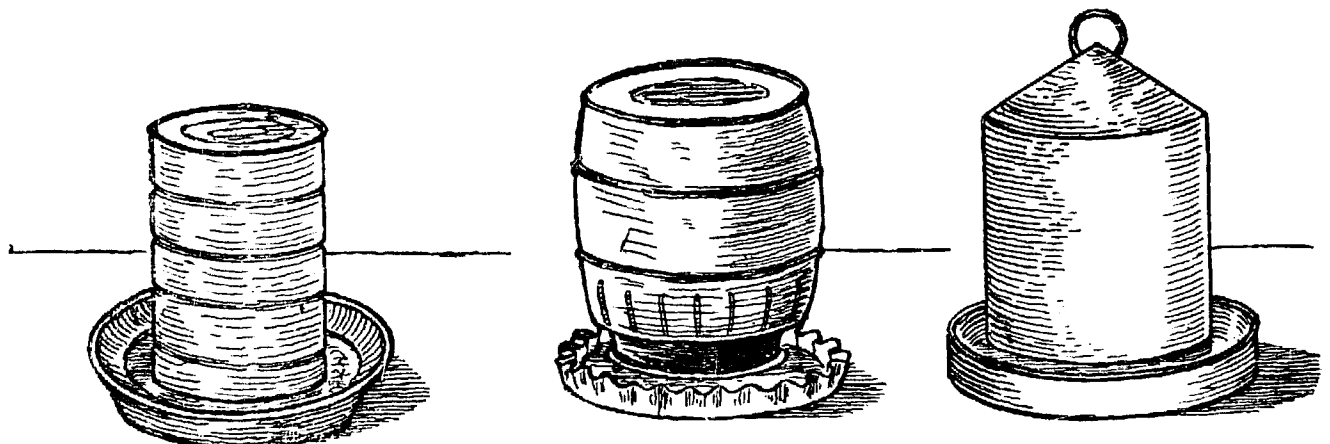


Fig. 44. Metal water containers. (a) Discarded can filled with water and inverted in a pan. (b) Glass jar screwed into metal base. (c) Metal waterer made by tinsmith.

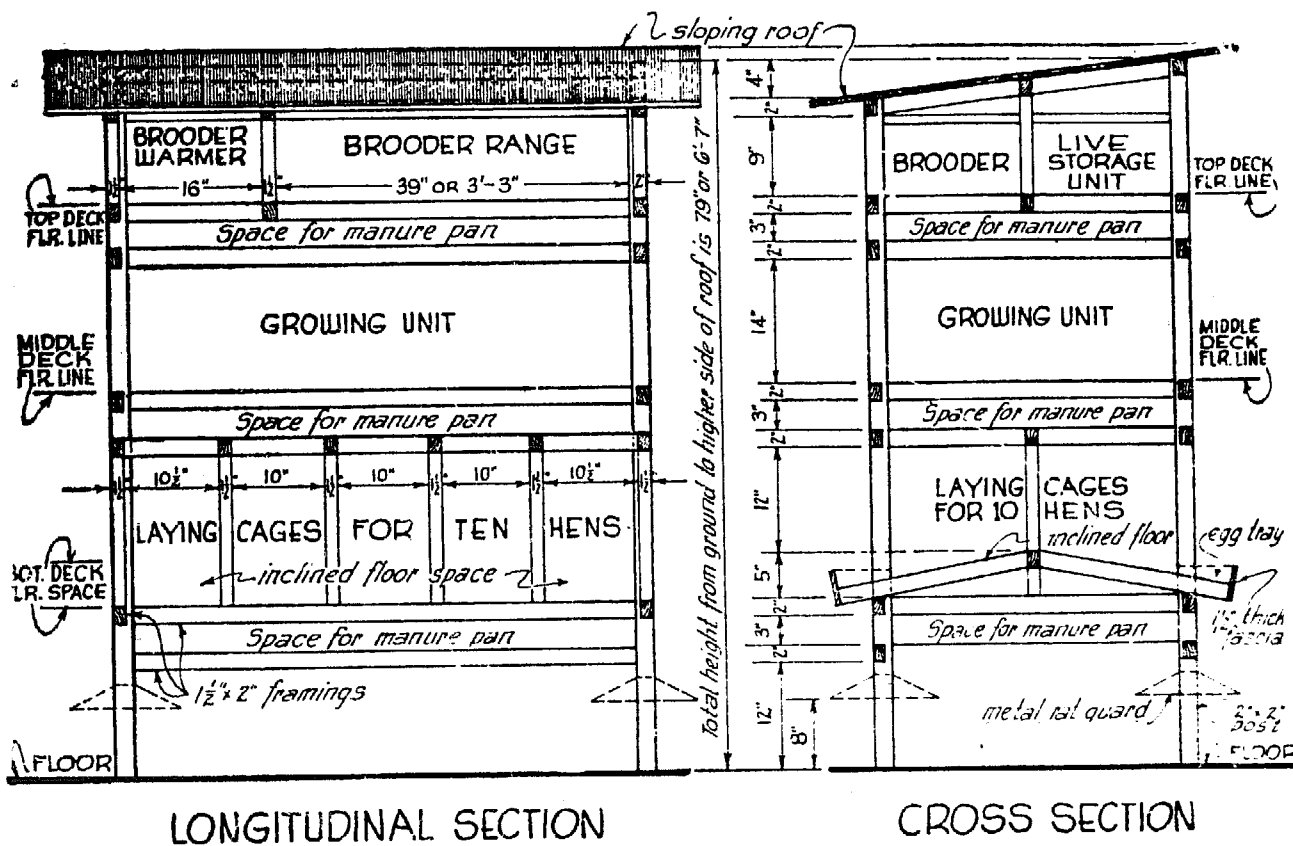


Fig. 45.

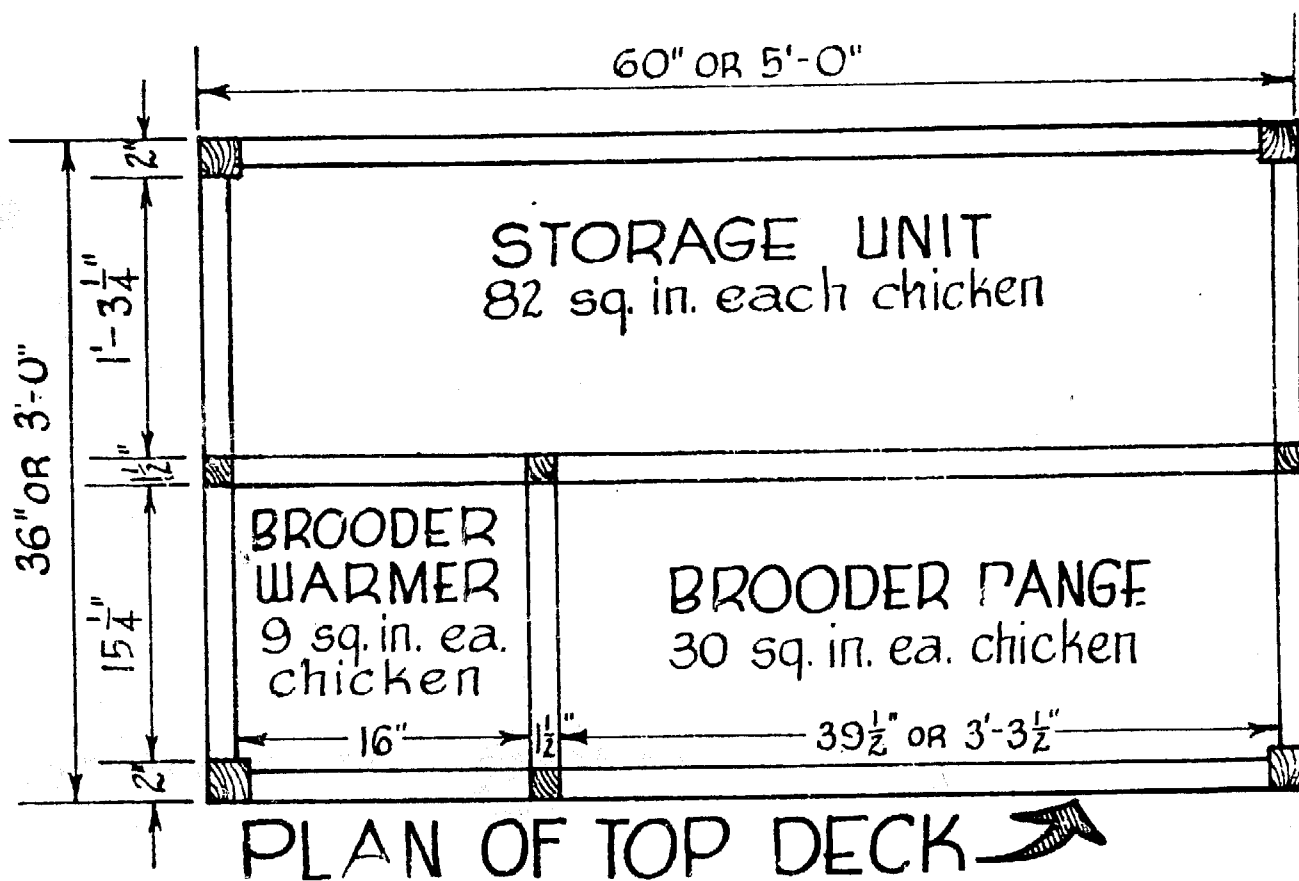


Fig. 46.

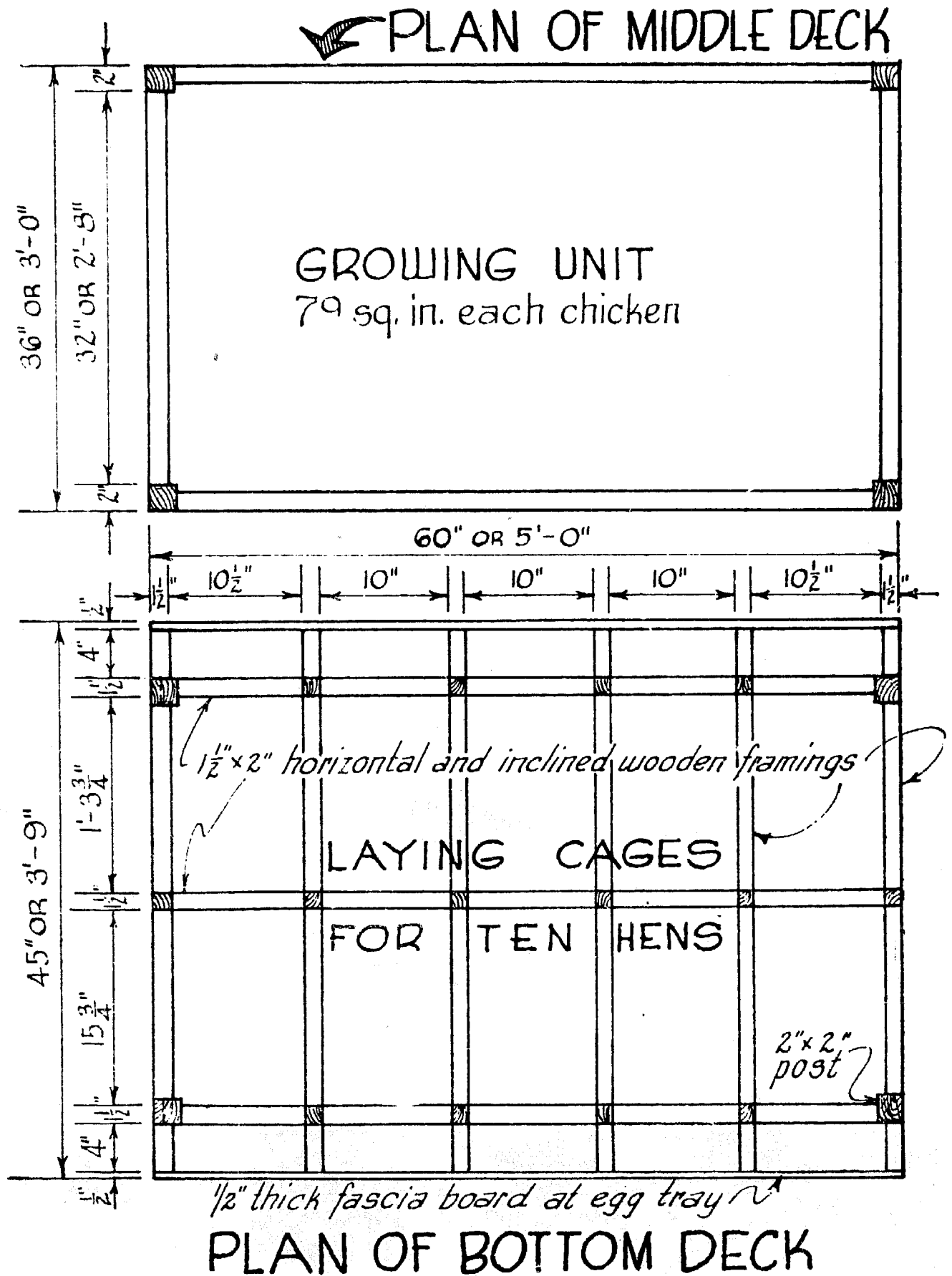
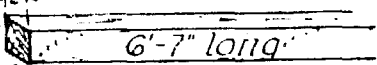
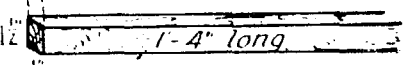
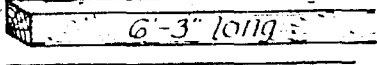
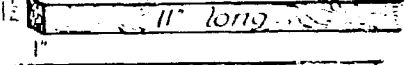
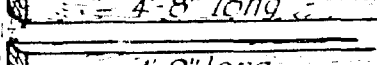
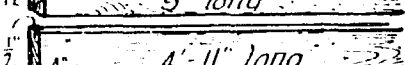
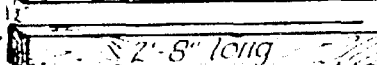
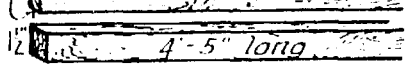
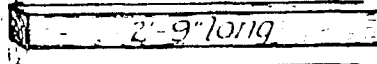
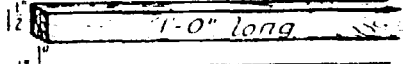
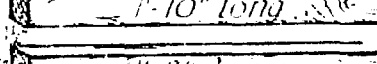
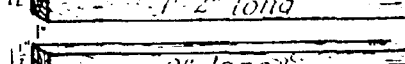
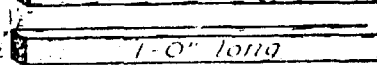
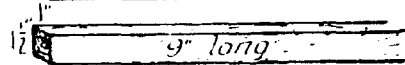
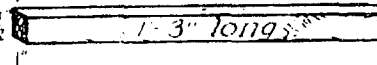
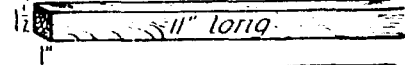
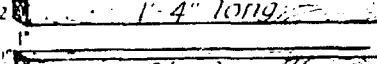
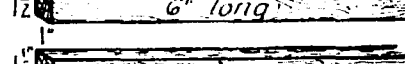
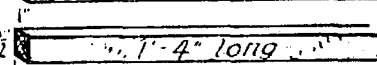
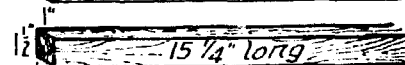
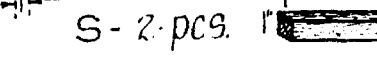
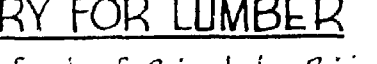
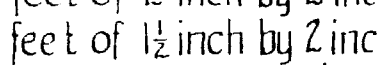
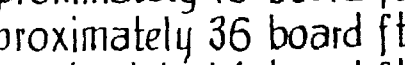
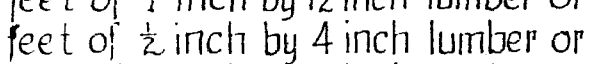


Fig. 47.

LUMBER

A - 2 pcs.		L - 1 piece	
A ₁ - 2 pcs.		L ₁ - 1 piece	
B - 14 pcs.		L ₂ - 1 piece	
B ₁ - 4 pcs.		M - 2 pcs.	
C - 10 pcs.		N - 12 pcs.	
D - 2 pcs.		O - 4 pcs.	
E - 12 pcs.		O ₁ - 4 pcs.	
F - 2 pcs.		O ₂ - 4 pcs.	
G - 4 pcs.		P - 4 pcs.	
H - 8 pcs.		P ₁ - 4 pcs.	
I - 8 pcs.		P ₂ - 4 pcs.	
J - 2 pcs.		Q - 2 pcs.	
K - 1 piece		R - 2 pcs.	
S - 2 pcs.			

SUMMARY FOR LUMBER

30 - lineal feet of 2 inch by 2 inch lumber or approximately 10 board ft.
 144 - lineal feet of 1 1/2 inch by 2 inch lumber or approximately 36 board ft.
 110 - lineal feet of 1 inch by 1 1/2 inch lumber or approximately 14 board ft.
 6 - lineal feet of 1/2 inch by 4 inch lumber or approximately 1 board ft.
 6 - lineal feet of 1 inch by 1 inch lumber or approximately 1 board ft.
 Total lumber approx. 62 board feet.

HARDWARE

1/2 kilo of 3 inch Common Wire nails.
 3/4 kilo of 2 inch Common Wire nails.
 1/4 kilo of 1 inch Common Wire nails.

2.8 - lineal meters of 5-foot wide poultry wire for floors, partitions, and sidings.

Fig. 51. List of materials we need for wood frame Family Chicken Cage.

Feed and water troughs or containers are made of bamboo joints. (Fig. 42). Some people will prefer metal water containers, which can be made with an empty can and plate, or which we can buy at the store. (Fig. 44).

If we decide to make our own Family Chicken Cage with poultry netting and wood we need the pieces of wood and other materials shown on the plans, and a roll of 3/4-inch mesh of poultry wire. (Fig. 43). The construction details and finished job are shown in Figures 45 to 51.

Sheets of asbestos or corrugated iron, aluminum, or tempered l-
wanit make the best roof.

As we may keep our Family Chicken Cage in the patio or backyard, where it will be somewhat exposed to wind, rain, and sun, we should provide curtains which can be hung from the top, and let down when necessary to protect the chickens. Empty sacks of jute or kenaf make satisfactory curtains.

If we use iron or aluminum roofing, we should cover it with sacks or other material when the sun shines on it. If the metal roof is under the bright sun, the top cage will be too hot. That is why many of us prefer to keep our Family Chicken Cage under the house or in a shed.

The preceding five pages show pictures telling how we can build a wood frame Family Chicken Cage ourselves or have a carpenter build it for us. But these pictures are *guides only*. Each one of us can use his resourcefulness and ideas according to the materials

available. The most important part we must follow is not to make the spaces allotted to each chicken so small that the chickens will be crowded.

The Dropping Pan for the chicken manure is shown on a subsequent page. We may find a tin-smith to make for us a galvanized pan like that shown in Fig. 57. Or we can even make the dropping pans in the form of sawale trays nailed to a wood frame.

Selecting Our Baby Chicks

What variety or breed* of chicks should we buy from the Poultry Supply Man? Can we use native chicks which we buy from a neighbor? Are imported varieties sufficiently resistant to tropical diseases?

Let us discuss these questions in reverse order.

Imported varieties from healthy stock (ancestors) are successfully raised under the cage system, because they are not exposed to the poultry diseases that are spread by contact with the ground. Each chicken is kept in an elevated cage, and has contact only with the other chickens bought from the same supplier, which we know to be healthy. About the only sickness we are likely to find is the occasional weak chick that is found in any hatching, and which soon dies. We see the same thing among many large families; some children die in infancy, another may live but be weaker than the others. If

* For the purpose of this program, no distinction is made between the terms breed and variety.



Fig. 52. **Red Hampshire rooster and hen.**

we buy our chicks from a successful breeder we should not lose more than 1 or 2 chicks out of each 25 we buy. This rule will apply equally to native and imported chicks when raised in cages.

We can use native chicks which some neighbor may sell to us, but this is not recommended. The expert commercial poultryman who operates a hatchery does not hatch the eggs of native hens. So if we buy native chicks, we will have to buy them from someone who may have many weak chicks among those hatched by him, and they may carry diseases to our cage. One man with a Family Chicken Cage lost from disease all of his flock because he accepted a gift of chicks from a friend.

The great advantage of the im-

ported varieties of chickens is that *they gain more weight and lay more eggs for each kilo of feed we give them*, than is the case with the native chickens. These imported varieties have usually been selected from among the best of many generations over a long period of years.

The varieties of imported chickens recommended for the Family Chicken Cage are what we call the dual-purpose type. That means that they lay many eggs and also carry plenty of tasty meat on their bodies. The **White Leghorn** is not a dual-purpose chicken. Its greatest achievement is laying more eggs than most varieties. But many people do not care much for the White Leghorn, because it has less meat, and the flavor is not so



Fig. 53. Lancaster rooster and hen.

good as dual-purpose varieties. Since we are primarily interested in the chicken's meat, and will be satisfied if our 10 laying hens give us an average of 5 or 6 eggs a day, we will prefer one of the following dual-purpose varieties, which can be found at the different Philippine chicken hatcheries: Lancaster, New Hampshire, Rhode Island Red. (Fig. 52 and 53).

Many poultrymen who operate hatcheries are now producing mestizo or hybrid chicks by crossing one of the above varieties with the

other for each hatching. They claim that this brings greater vitality and strengthens the desirable qualities of the offspring. The poultrymen call this result "hybrid vigor."

So let us select only the best varieties, based first, on the reputation of our supplier of baby chicks and second, on actual results we experience in operating our Family Chicken Cage.

Where To Buy Chicks

There are a number of reliable poultry hatcheries near Manila and

a few other major cities or towns where we can buy one-day-old chicks. The hatcheries with chicks for sale advertise their service in the newspapers. Your local Agricultural Extension Man may also be able to help you locate a good hatchery.

Newly hatched chicks can live safely for 60 to 72 hours (2-1/2 to 3 days) without food or water. They are born with enough substance from the egg to keep them alive this long. If our home can be reached by mail, railroad, bus, or air express in less than 3 days from the time the chicks are hatched, we can get our chicks from one of these commercial hatcheries. Otherwise we must find some poul-

tryman near us who will supply us with the chicks we need at monthly intervals.

One-day-old chicks are usually sent in light cardboard or "carton" boxes with holes for ventilation. Each box contains 25 to 100 one-day-old chicks.

Air Shipments

The Philippine Air Lines (PAL) has been successfully shipping baby chicks by air for the past 12 years. PAL informs us that in all this time it has not had any claims from the public due to the death of chicks or to delays or losses. It is carrying shipments of chicks almost daily by airplane. The rates are from ₱0.30 to ₱0.60 per



Fig. 54. Cardboard cartons containing 25 chicks one day old, by air express.

kilo, with a minimum charge of P2.50 for each shipment (10 centavos per chick *minimum*). (Fig. 54).

Those who live right in the town where the airport is situated will receive the chicks either delivered to their address, or notice will be immediately sent by PAL of the arrival of the chicks. Those who live away from the airport will have to arrange for someone to receive and forward them to their destination.

Poultry Feeds

A successful Family Chicken Cage is made possible because we can now buy special feeds which furnish every substance which helps the chicken to grow fast, to lay more eggs, and to remain healthy. These special chicken feeds are manufactured for the people who produce poultry and eggs as a business, for profit. So the feed manufacturers make various combinations for different purposes.

Manufactured Poultry Feeds

The principal types are the following:

Starting mash, for baby chicks until they are about 6 weeks of age.

Growing mash, for raising broiler chickens for meat and for laying hens until they are old enough to lay eggs.

Laying mash, for laying hens to increase egg production.

These "mash" feeds come in the form of meal, but some factories

make them into pellets or small pills, which are broken into smaller pieces, called crumbles. Many people believe the pellets are better, because each pellet is sure to contain all the good substances the chickens need. For our Family Chicken Cage there will be less of the feed spilled on the floor if we use the pellets instead of the dry mash or meal. Pellets, however, cost more than mash feeds.

Poultry feeds come in 45-kilo bags. Some are said to be 100-pound bags, but as pound scales are illegal for merchants in the Philippines there is no way to be sure of the weight unless it is marked in kilos.

The manufacturers of poultry feed are not interested in selling us one or two sacks of mash. They sell at wholesale to retail dealers or to large poultry farms which buy 50 or more sacks at a time. They cannot afford to have a truck go to our house to deliver one or two sacks of poultry feed. Before we start our Family Chicken Cage, therefore, we must make arrangements for a steady supply of feed with a local retail dealer.

How many sacks of chicken feed will we need?

Each chicken will consume about 2.8 kilos of feed up to 2 months of age, on the average. As we plan to produce 250 chickens during the year, that means 2.8×250 or 700 kilos of feed a year for the chickens we eat. Our 10 layers will consume about 360 kilos. So we have a total of 1,060 kilos or about 24 sacks a year. That is 2 sacks a month.

It will not be worth our while to order all three kinds of feed, one kind for small chicks, one kind for larger chickens, and a third for laying hens. For our small project the same kind of feed will serve all our needs very well. The one most suitable for all purposes, we believe, is the starting mash. So if we have a standing order with the poultry feed dealer for 2 sacks of starting mash or pellets a month, we should be able to operate our Family Chicken Cage very successfully.

By limiting our type of feed to starting mash we are omitting something our laying hens need, that is to say, calcium or lime. The hens need calcium to form egg shells and for the bones of the growing chickens. So we should grind up egg shells, or clam and oyster shells, so as to add calcium to the feed of the laying hens.

Some of us will want to use our table scraps and garden surplus to feed our chickens, so as to buy less of the factory-made poultry feeds. This does not always work well. Many of our scraps are wilted or spoiled leaves, or other spoiled material. They may cause the chickens to get sick or die. Most of us eat all the "scraps" of anything that is good to eat, so there is not much left for the chickens which has real food value. Also, when our chickens are used to commercial feed, they will not care for scraps, but will scatter them.

If we have a vegetable garden, we may have surplus *fresh* feed which can be fed to the chickens.

If we do use *fresh kitchen scraps* and vegetables as chicken feed, they should be *in addition* to the *regular complete feed* and given at the same time. If they are what the chickens need they will be eaten first, and thus reduce the need for the manufactured feed. But if the chickens prefer the manufactured feed, it usually means the scraps will not be good for the chickens.

Making Our Own Poultry Feed

If we are unable to buy complete poultry feeds in our town, we shall have to make our own mixture.

The experts in poultry raising have found that chickens need a variety of substances in their feed, in order to be healthy and grow fast.

Starchy Substances

One of the principal substances used for poultry feed is *yellow corn*. This grain is a starchy food needed by chickens, and is rich in vitamins, especially Vitamin A. The white corn may also be fed to our chickens, but in that case ipil-ipil leaves, or leafy vegetables or grasses cut into small pieces should be given to supply the needed Vitamin A.

If we have surplus bananas in our garden they may be added to the poultry feed to replace part of the yellow corn meal. Broken rice (binlid), molasses, and boiled camotes, cassava, ubi, tugui and gabi are also good substitutes for the corn meal when they are cheaper.

Rice bran (darak) is another principal substance which is also rich in vitamins. First class rice bran obtained from the cono type rice mills should always be preferred to second or third class darak for poultry feed, especially when feeding baby chicks. We should not keep darak for long periods because good rice bran has plenty of oil and easily gets spoiled if kept too long.

If coconuts are abundant in our town we can use copra meal from copra after we have extracted the oil, or use grated coconut meat, from which most of the milk has been extracted. We should not give too much coconut to small chicks, as it may cause loose bowels.

Animal Protein (Fish And Meat)

Another very necessary substance is fish meal or meat scraps.

They call this the "animal protein" part of the feed. The complete poultry feeds we get from the factories have a certain amount of fish meal, shrimp meal, or fish scraps, or perhaps some ground and dried meat scraps. The chickens in their natural state get this "animal protein" from the worms and insects they catch.

We cannot usually go to a store and order so many gantas of fish meal. Fish meal is for sale mostly in big towns where large quantities of fish are prepared for the market or for canning. The Philippine poultry feed manufacturers usually have to import from foreign countries much of the fish

meal they use in making the complete poultry feed they manufacture.

What can we use as a substitute?

If small fish, such as tilapia or minnows, are abundant and cheap in the town we can pound them into a paste and mix some of this with dry ingredients of our chicken feed.

Many of us who have started a tilapia pond have found that thousands of tilapia soon fill the pond. By catching some every day we can prevent over-crowding and at the same time get fish for our chicken feed. We may dry this under the sun, adding first a small amount of salt, and then pounding this later in the mortar after it is dry.

Another source of "animal protein" is snails, which can be pounded and mixed with the corn meal. The large African snails which damage our gardens are also good for poultry feed, and a garden pest is thus put to some good use. They have about the same feed value as fish meal. They can be pounded or passed through a grinder. Small shrimps and crabs also can be pounded and used as fish meal. In the case of snails, the shells supply calcium also.

Termites (anay) are also a very good source of animal protein.

Vegetable Protein

In addition to "animal protein" our chickens need *vegetable protein*. This is cheaper than "animal protein." It is found most



Fig. 55. Milk can is a good measuring cup for home-mixed poultry feed.

abundantly in beans, especially soybeans, mungo, kapilan (tapi-lan), and kadios (pigeon pea). But we can also use dried sitao beans, cowpeas, or patani. The beans have to be broken up by pounding or grinding. Soybeans and soybean meal give the best vegetable protein for chickens, and should be used if we can get it.

Minerals And Vitamins

In order to make egg shells the laying hens need to eat some calcium, or lime. This is given by pounding oyster, clam, or snail shells into fine particles. If we feed our chickens crushed snails, including the shells, this will satisfy the lime requirement. If we cannot get ground shells, we can use ground limestone (apog).

Complete poultry feeds contain a substance called vitamin D, which is found in fish oils such as codliver oil. This vitamin D permits the chickens to enjoy good health even without sunlight. But if we mix our own poultry feed, codliver oil and other fish oils may

be hard to find or be too expensive. In that case, we must expose the Family Chicken Cage to direct sunlight two or three hours a day by keeping it in a house with a yard. We can then roll the Family Chicken Cage out in the yard to get the sunshine.

Finally, we must add a certain amount of salt to the chicken feed mixture.

If we cannot buy complete poultry feeds in the town where we live, it is probably because we live in a rural community or barrio where we can get green things. We should give our chickens chopped green vegetables every day, to take the place of the substances found in the complete feeds made in the factory.

The chickens need these greens. The greens should be young and tender, and fresh. The extra leaves of our pechay, lettuce, camotes and talinum are all excellent.

Well-ground ipil-ipil dried leaves, mixed with the chicken feed, are excellent additions.

If we have to mix our own poultry feed, we will feed our kitchen and table scraps to the chickens. This includes the entrails and other waste parts of animals, properly chopped, and all the heads, bones, and shells of fish and shrimp, ground or pounded into small pieces. As stated above, table and kitchen scraps should be fresh. If the garbage is old and spoiled, it may cause the chickens to get sick. However, entrails and other parts of chickens killed for table use *should not be fed unless well cooked or boiled*. This is ne-

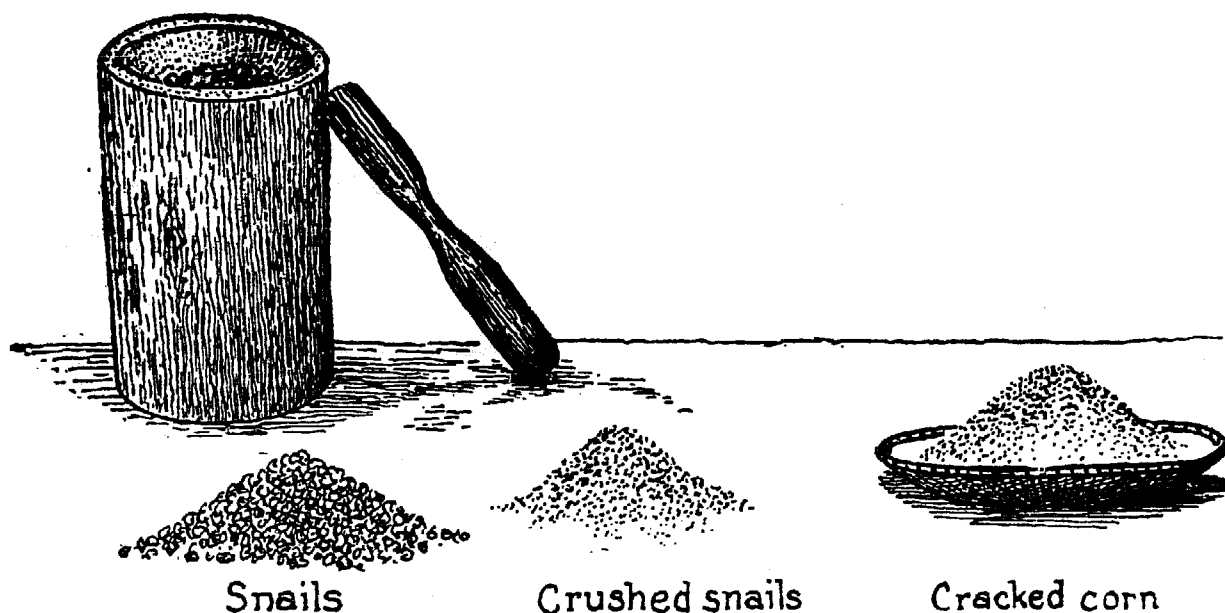


Fig. 56. Mortar and pestle can be used for grinding snails and corn to mix with darak for homemade poultry feed.

cessary to prevent the spread of diseases.

When we mix our own poultry feed, we should do it daily because we will be using substances which become spoiled, such as fish, animal wastes, and shrimp scraps. (Fig. 56).

Once the Family Chicken Cage is being operated fully, our 25 small chicks of 1 to 30 days old, plus our 25 broilers 30 to 65 days old, plus our 10 laying hens, or 60 chickens in all, will need $1\frac{1}{4}$ to $1\frac{1}{2}$ gantas of feed per day. For our home-made mixture, we should probably prepare $1\frac{1}{2}$ to 2 gantas every day, to give allowance for any increase in feed consumption. We can increase or decrease the amount, depending on how much the chickens actually eat and consume.

For each ganta or 8 chupas of home-made chicken feed, we find the following proportions to be about right, using either a stand-

ard measuring cup, a chupa measure ($\frac{1}{8}$ liter) or a milk can. (Fig. 55).

- 4 chupas yellow corn meal or broken rice
- $1\frac{1}{2}$ chupas rice bran (darak)
- 1 chupa of dry fish meal (or 2 chupas of fresh fish or meat scraps or ground snails)
- $\frac{1}{2}$ chupa copra meal
- $\frac{1}{2}$ chupa ground mungo, sitao, cowpeas, patani, or soybeans
- $\frac{1}{2}$ cup dry ipil-ipil leaves, with a tablespoon of salt and a handful of powdered shell or agricultural lime long exposed to the air (apog)

If we use *boiled* gabi, ubi, cassava, or camotes, or fresh bananas, as a substitute for corn meal, we use double the amount to make up for the wet condition of these substances, which swell in size compared with dry corn meal.

In addition to this mixture, we must feed the chopped fresh greens to our chickens. The greens are especially important if we lack yellow corn meal.

Factory Poultry Feeds Are Best

Although we now have an idea of how to mix our own poultry feed to operate the Family Chicken Cage, we know that whenever we can get a poultry feed made by a reliable manufacturer, it will pay us to buy the feed instead of mixing it ourselves.

In buying our poultry feed in mash or meal form, we must be sure it is a *complete poultry feed*, because some factories also make a mash which the poultryman is supposed to mix with grain, that is to say, a concentrate which must be *supplemented* by the purchaser with ground corn. This may not be convenient for us when we are operating a Family Chicken Cage.

Managing The Family Chicken Cage

In discussing how we manage our chicken cage let us first consider briefly what we do step by step from the beginning.

First, we have chosen a chicken cage that will hold 25 baby chicks in the brooder, and 25 larger chickens (for cooking or for slaughter) in the growing unit, 10 laying hens in the laying cages, and 12 to 15 broilers in the storage cage.

We start our project with 25 one-day-old chicks that we have bought from a reliable poultryman. On our first order we get both the

males and the females: what the poultrymen call "straight run" chicks. We place the baby chicks in the top unit of the cage which is the brooder, where we leave them for about one month. (Fig. 41).

For convenience we will call this first bunch of 25 chicks Flock A.

When they are one month old we transfer them from the brooder to the larger unit below called the *growing deck*. (Fig. 41). The growing unit is big enough to accommodate 25 young chickens until they are ready to be killed at the age of two months. At the same time when we transfer Flock A to the growing unit, we clean the brooder and place 25 new one-day-old chicks in it, which we will call Flock B. While Flock B passes its first month in the brooder, we keep Flock A in the growing unit for one month, that is, during the second month of our project.

When our first 25 chicks, Flock A, have grown to the eating size in two months, and weigh about one kilo each, we take them out and place those we want to keep in the storage unit and slaughter the remainder. We then clean the growing unit and transfer Flock B from the brooder to it, because Flock B will now be one month old.

We buy 25 more baby chicks, Flock C, and place them in the brooder, after cleaning it well.

By continuing this process, we should always have 25 baby chicks in the brooder, 25 larger chickens called "broilers," or "fryers," in the growing unit, and 12 to 15 of the larger chickens in the storage

unit. We have to sell or slaughter about half of the two-month-old chickens, because the storage unit is big enough to hold only about 12 to 15 broilers or fryers. Many of us will sell half of our 25 chickens (preferably the males first) when they are two months old, and keep about 12 or 15 in our live storage unit. The sale of these delicious chickens should bring enough money to pay for the one-day-old chicks and for the feed we give to our chickens.

This storage unit is something especially designed for the Philippines. (Fig. 41). In the United States and Europe, when people take the 2-month-old chickens from their growing units, they kill them, clean them and put them in their electric freezer for cold storage until they are needed in the kitchen. Most of us here do not have large electric freezers, so the chickens we take from the growing unit are transferred to the storage unit until we are ready to kill them.

Thus we have *live storage* instead of *cold storage*. Suppose we sell 12 of our Flock A, which are 2 months old, to our neighbors; that leaves us 13. We will want one for dinner today. So we place the remaining 12 in the storage cage for our family use during the ensuing month. That gives us about 3 chickens a week for our table, and while they are in the storage cage they are growing larger and larger.

The first three or four months we will not have 25 chickens to sell and eat. Out of each flock we will

select four or five of the largest and healthiest female chickens for our laying cages. (Fig. 41). Those of them that delay laying eggs or do not lay enough eggs, we have for dinner and replace them with new layers. Of course, if we can buy 10 young female hens (pullets) ready to lay from a reliable poultryman, we will only have to select the choice ones from our growing cage to replace those which do not lay enough eggs.

Now that we have seen the general system of managing the Family Chicken Cage, we discover that we will be operating a small factory, with an assembly line which turns baby chicks into delicious food. But we cannot expect to get something for nothing. We must study, observe, and learn, and we must expect some adversities.

We keep poultry feed in the feeding containers at all times, so that the chickens will always have feed. If they get hungry for lack of feed they are apt to peck each other and cause wounds. We will quickly learn how much they consume in a day. Most of us feed them once in the morning and again late in the afternoon. It is not good to put too much feed in the containers, because that causes a lot of it to spill. To prevent spilling feed on the floor by the chickens, we find it a good plan to sprinkle a little water on dry feed in the cage feed containers.

Mortality

Now for some bad news. We are not likely to have always 25

chicks in our brooder and 25 broilers in our growing cage, because some of our chickens are likely to die. In any flock of chickens there are a certain number which are born too weak, and die very young. Others are born with some defect which we do not see, and they, too, may die. But, as stated before, if we lose only 1 or 2 chicks out of each 25 we buy, that is to be expected.

Another thing. We must not be slaves of our schedule of 25 chicks every month on the exact day. Sometimes the hatchery operator will be late in delivering our order of chicks; or the hatchery may lose most of its flock from some chicken disease. Perhaps a typhoon will cause the shipping service to be suspended. Some of us may prefer to work on 5-week intervals instead of months.

The advantage of a regular schedule is this: we can have a standing order with our supplier for 25 chicks and a certain amount of feed every month. This will give us priority of service, because the hatchery and poultry feed dealer can plan their operation to serve us.

But it really does not make much difference whether we leave our chickens in the growing and stor-

age units one or two weeks longer than we expected. However, we should transfer the chicks from the brooder not later than 5 weeks old, because the brooder is too small when they grow larger.

Watering And Feeding Containers

Some Family Chicken Cages have watering and feeding containers on the outside of the cage, made of metal or bamboo. Bamboo is cheap and convenient. (Figs. 39 & 40). The chickens reach their heads through the cage and help themselves, without getting the containers too dirty.

Some of us find it better to use a plate for water and feed in the brooder compartment during the first week, and an inverted jar type of watering container. (Fig. 44).

But we must clean these containers frequently, and see that there is always plenty of fresh water. If they begin to have a bad smell they should be scrubbed with a brush and dried in the sun.

Cleaning The Cages

Cleanliness is the key to healthy chickens. In addition to cleaning the water and feed containers, we must also remove the poultry ma-

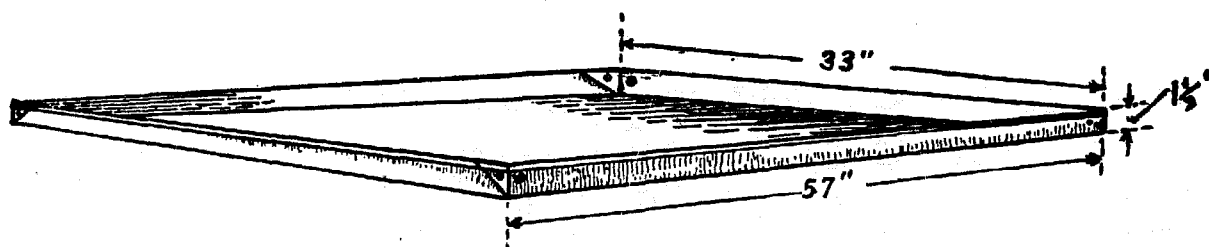


Fig. 57. Galvanized dropping pan for poultry manure. One is needed under the open floor of each deck.

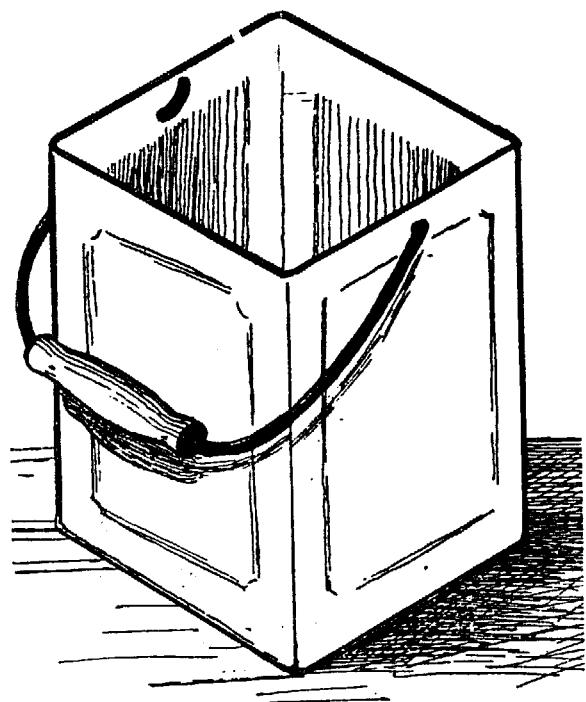


Fig. 58. Manure can for storing poultry droppings.

nure every day, because we do not want our home to have a bad smell. Below the open floor-strips or poultry wire floor of our cage is the galvanized iron "droppings tray," into which the droppings (chicken manure) fall. (Fig. 57). We remove this each day and scrape off the manure and wash and dry the tray before returning it. We also scrape off any accumulation of manure on the floor. But if we spread old newspapers, rice hulls, or even sawdust on the metal trays, we may find that the smell disappears, or is unnoticed. If our Family Chicken Cage is in a well ventilated place, daily cleaning is not so necessary. We should not place rice hull litter where the small chicks can peck at it, as it may make them sick.

Remember, if the manure is im-

mediately mixed with sawdust, rice hulls, straw, or similar substance, it should not smell bad. It quickly becomes compost, and can be stored for use as fertilizer. It is best to keep a special can for the chicken manure until we have enough for the garden. (Fig. 58). If we have powdered lime (apog) to scatter on the litter, that also reduces odors.

Disease is not a problem with the Family Chicken Cage, if we buy healthy chicks and keep them always in the cage, away from the ground.

Rats might carry disease, so it is important to keep rat poison near the cage, or place rat guards around the supporting posts so that rats cannot get into the cage.

Brooder Operation

In the warm climate of the Philippines it is not usually necessary to give artificial heat to the brooder. If we drop a curtain to keep out cold winds, the chicks can keep warm enough by crowding together when they are cold, and make their own heat in the inclosed brooder compartment. If during November, December, and January the nights get too cold, it is sufficient to put a small lamp or lantern in the brooder compartment. (Fig. 59). It is important that the lamp be fixed firmly so as not to cause a fire, and that it be surrounded by a screen, so that the chicks will not burn themselves. If we have electricity we use an electric lamp. A 50-watt lamp, burning night and day for the first 15 days, is enough.

Even in the cool season we find that after our chicks are a week or two old, they do not need artificial heat. However, if our Family Chicken Cage is exposed to strong winds, we can place straw or wood shavings on the floor of the brooder deck and broiler deck, which will keep the cage warmer. This straw, or litter, will pick up the chicken manure (droppings) and can be stored in the fertilizer bags or cans.

Molting

After the hens in the laying cages have been laying eggs for about 10 months they will usually start to molt, some losing all their feathers, some only part. During this period, which lasts 2 to 3 months, they will lay very few eggs, or maybe none at all.

In the case of the young layers (pullets), they may start to molt three or four months after they start laying. This is especially true for chicks which we get from November to February, because August, September, and October are the usual molting months in the Philippines.

Extra Eggs

For some of us, especially those with large families, the 5 or 6 eggs we average daily from our 10 laying hens, will not be sufficient. In that case it is easy enough to make an extra section of laying cages only, which we can place alongside our Family Chicken Cage. However, we can start with the 10 laying cages, and add more after we have them all filled with laying

hens, and decide that we want more eggs for our kitchen and table.

Operations Record

We want to keep a daily record of our operations of the Family Chicken Cage. If too many of our 1-day-old chicks die, we should report it to the hatchery where we buy the chicks and ask for replacements or adjustments. If one of our layers is not laying enough eggs during the year, we replace her with a new one and eat the hen we cull out as a poor layer. Purchases of feed and chicks should be recorded. After a year such a record will show us whether our project is worthwhile.

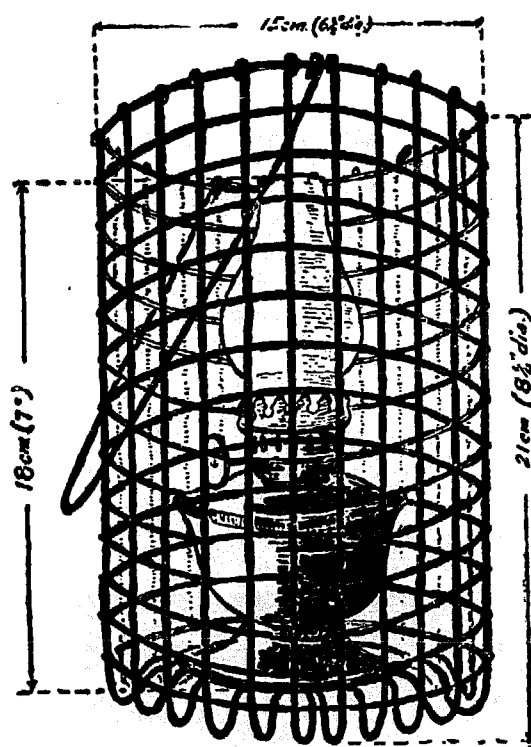


Fig. 59. Lamp for enclosed brooder compartment, protected by wire cage.

Agricultural And 4-H Clubs

The Family Chicken Cage should prove a worthwhile activity for the Agricultural Clubs organized under the auspices of the Bureau of Public Schools and for the 4-H Clubs promoted by the Bureau of Agricultural Extension.

For instance: the school poultry project, operated by the school as a whole, could breed, hatch, and raise chickens, so that the pupils may learn all the basic skills of poultry raising from "egg-to-egg-again." This project could also raise enough *extra* chicks to be able to sell one-day-old chicks to the pupils who have Family Chicken Cages at their homes. The school project could also have its own facilities for mixing complete scientific feeds for sale to pupils with home chicken cages. Another vocational activity of the schools could well be the making of these family chicken cages of bamboo and other local materials.

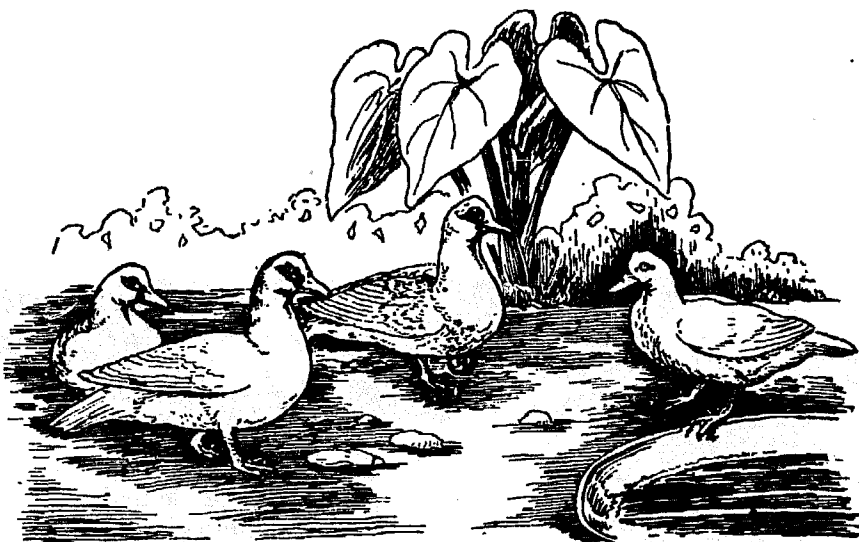
The school poultry project could be self-supporting, once a few members of the agricultural club

are ready to start their Family Chicken Cage. The school project could mix and supply the correct type of feed, operate an incubator or other form of hatchery to supply chicks to its members, and collect payment in the form of chickens and eggs, which can be sold in the neighborhood.

In the case of 4-H clubs, they would have to form a committee to handle the supply of feed and chicks, unless commercial suppliers can do so.

As pointed out earlier, the Family Chicken Cage is primarily for the towns and cities, rather than for the barrios. The barrios have more space for "backyard" poultry, and many of them are too far from hatcheries and feed dealers to be able to operate a Family Chicken Cage profitably. Hence, the Agricultural Clubs, and the 4-H Clubs *in the more distant* barrios would not as a rule find the Family Chicken Cage very suitable.

Fig. 60. Muscovy (bibe) ducks resist disease and do not need pond. Ducks and their eggs are tasty.



Raise Ducks Without A Pond

Do you like duck meat or duck eggs? If you do, we recommend you raise a few ducks in your yard. You can raise ducks in addition to chickens, or raise ducks only.

Ducks do not need a river or pond. They can be raised much the same way as chickens. One farmer tells us that he gets more eggs without using a pond.

There are many advantages to duck raising in our backyard. The eggs are very good, and if the ducks do not feed on too many snails the eggs do not have a fishy taste. They eat the same kind of feed as chickens. They gain weight rapidly and produce plenty of eggs. Ducks are easy to take care of, and they catch very few diseases except the "avian pest," and seem very resistant to that sickness. Many barrio farmers in Luzon began raising *bibe* (muscovy) ducks a few years ago, when diseases began killing all of their chickens, and they have been very happy to find that these ducks do not get sick very often.

How To Start With Ducks

If we can get one male and two female ducks, that makes a very good beginning for the SAMAKA farm. If we cannot get grown ducks we can start with duck eggs and set them under a setting chicken.

There are two kinds of ducks that are well known in the Philippines.

The "itik" duck is found mostly where ducks are raised near the rivers, lakes, and ponds. They are raised chiefly to produce eggs for the *balut* industry. We usually raise this kind of duck only where there are plenty of snails and small clams, which are cheap food. But some farmers have found that they can feed the "itik" other kinds of food. The flesh of the "itik" duck is not very tasty. These ducks do not sit and we have to set the eggs under hens. The eggs of the "itik" duck hatch in 28 days. In short, the "itik" duck is really for the commercial farmer, instead of for the farmer raising his own food.

The muscovy duck, which we in the Philippines call the "*pato real*" and "*bibe*," is well-suited for the farmer who wants a tasty meat and also good eggs. They are suitable wherever chickens can be raised. They are good sitters and brooders and can hatch the eggs they lay. The eggs hatch in 33 days. (Fig. 60, page 110).

Our Duck Pen

We need only a small coop and yard. If we have a large enough double chicken yard, where green things grow for our chickens, we can allow the ducks to forage alternately with the chickens (Fig. 61). We should not let the ducks mix with the chickens, especially in a small yard.



Fig. 61. Keep ducks separated from chickens.

Water For Ducks

The pen for the ducks should have a drinking water can at least one hand deep and two hands wide. To allow the duck to bathe, we can place a section of a barrel, or use a laundry pan set in the ground. (Fig. 62). If we have a home fishpond we can let the ducks use a small part of the fishpond, but then we should put a fence around the fishpond so the ducks will not get into our vegetable garden. We will not find it good to use the fishpond for ducks unless there is plenty of water, because the ducks will make the water dirty. Then we would have to keep changing the water.

Breeding Ducks

If we start with one male and two females, we should keep them in the duck pen, with straw scattered around the ground. A couple of nest boxes can be placed in the shelter or coop, and the ducks will build their own nests there. Bibe (muscovy) ducks can hatch 12 or 15 eggs to a sitting. The eggs of these ducks hatch in about 33 days. After that we can raise the little ducklings like chicks.

Ducklings start eating 1 day after hatching, and they grow very fast.

Starting Ducks With Eggs

If we begin raising ducks by setting the eggs under a sitting chicken hen, it is important to place the eggs under the hen when she first gets broody. It takes a week longer for itik duck's eggs to hatch than chicken eggs, and 11 days longer for the bibe eggs. As duck eggs are large, a chicken can take care of only 7 or 8 duck eggs.

We have to care for the chicken hen carefully when she is setting on duck eggs. We must allow her to leave the nest every now and then for feeding and watering. If she does not go back before the eggs get cool, it may be because there are mites. In that case we should burn the litter and spray the empty nest with kerosene or dip it in boiling water. Then we put in a thick spread of new litter and place the eggs back. Everytime the hen leaves the nest we have to sprinkle the eggs with lukewarm water. The wet feathers of the

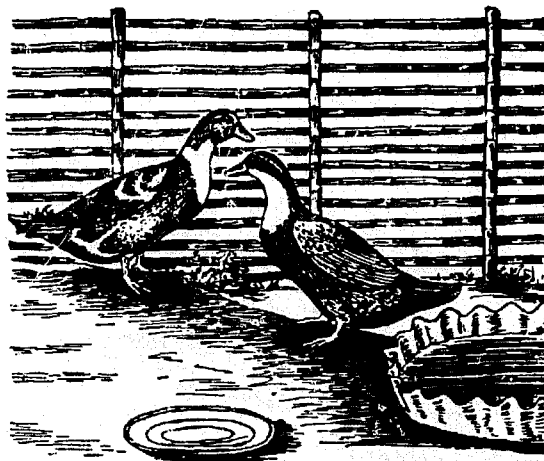


Fig. 62. The duck does not need a pond, only a bathing pan.

duck moisten the eggs, but when we use a chicken hen, we must do it.

Killing And Dressing Ducks

The young ducks will be ready for our table anytime after they are 10 weeks old. We kill them the same way we kill a chicken. We can pluck the feathers dry, but this is a lot of work. To make plucking easier, it is better to scald the duck in a pot of near boiling

water, moving it about continuously until we find that the feathers come out easily.

Making Balut At Home

If we and our family enjoy balut, we may decide to make some for our table by gathering the eggs from the setting duck about the 16th or 18th day after the setting began. Then all we have to do is hard boil the eggs for about half an hour.

Pigeons, Turkeys, Geese

Pigeons

Raising pigeons is not very difficult. The young pigeons one month old are excellent for the table and bring a good price in the City markets. We have to feed them a lot of grain and mungo, so if we are raising chickens and pigs, we may not have enough grain feed to raise pigeons also.

If a SAMAKA farmer living not far from a large city decides to raise pigeons he can sell half of the young pigeons (called squabs) and his family can eat the other half which will cost them nothing.

Farmers interested in pigeon raising can ask the Bureau of Animal Industry to send them a book of directions, or they can consult with the Agricultural Extension Man.

Turkeys

Raising turkeys is not a good business for the SAMAKA gar-

den. Turkeys take special care and a large area of land. If we want a turkey for a special occasion, it is better to buy a young one and raise it in our own yard, but not with the chickens. Chickens often cause turkeys to catch diseases.

Geese

Geese are raised to a small extent in many towns of the Philippines. They can be raised at less expense, and less attention than other poultry.

Geese grow rapidly. They are the only class of poultry able to use grass as their principal feed, so it is profitable to raise geese only when we have adequate grassland.

Many barrio farmers like to have a few geese at their house because they serve the purpose of a watch dog. Whenever a stranger or some animal comes near, the geese "honk" very loudly and wake everyone around.

How To Raise A Pig Without Buying Feed

Pork is the most popular meat in the Philippines, but few of us farmers get enough pork to satisfy our appetite.

The SAMAKA farmer can easily raise enough pigs in his own backyard to supply his family with pork three times a week all the year through. In this chapter we are not going to talk about how to raise pigs for sale in the market. Here we are going to talk about raising pigs to eat in our homes.

The secret of raising pigs for our own family food is to raise and fatten our pigs chiefly with our surplus garden products and table scraps, and any farm by-products we may have.

It is not usually wise for us to breed our own pigs. This is the job for the man raising pigs for the market. It requires a lot of time, experience and work. For our SAMAKA farm, we should get two or three good piglets during the year, 8 to 10 weeks old, and raise them to maturity. If we can only afford one pig, let us start with one and get another later when we can afford it. If we have no cash to buy the pig, we should try to get some farmer who breeds pigs to give us a small pig and allow us to pay him with a percentage of the meat of the mature hog when it is killed.

The following points are to be considered by the SAMAKA far-

mer who wants abundant pork for his table:

- Building a piggery
- Selecting the piglets
- Feeding
- Diseases
- Slaughtering
- Preserving

Building Our Piggery

The place where we raise our pigs is called a piggery. It usually consists of a shelter or shed, which we will call the pigshed and a small fenced yard adjoining, which we will call the pigpen.

It does not pay to let our pig loose to wander around the town. He might catch some sickness. He destroys our garden and the gardens of our neighbors. We may either keep him inclosed in the pigshed or within a fenced inclosure.

Animals raised for breeding purposes should not be kept al-

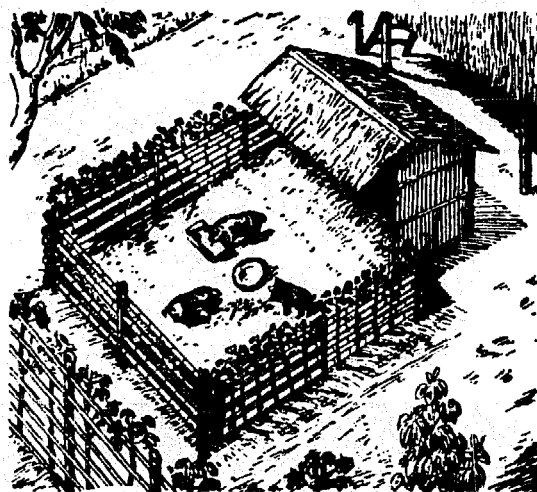


Fig. 63. Pigshed and pigyard with bamboo and cassava fence.

ways in the pigshed, but this practice is all right when we raise pigs for the table. If we want our pigs to move around the field where they have access to grass and sunlight, we should always tie them with a rope fastened to a harness or through the ear. (Fig. 64).

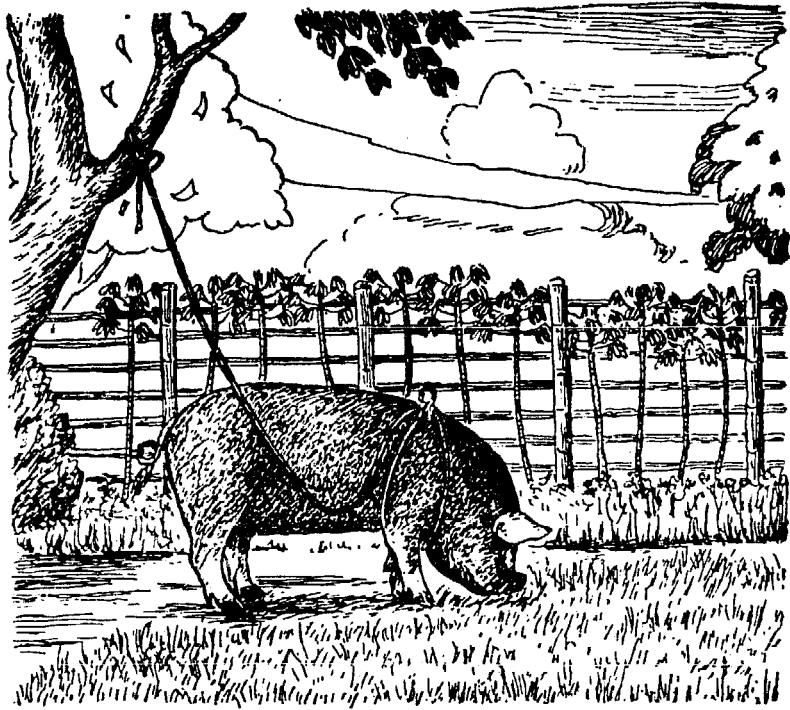


Fig. 64. Keeping pig tethered is good way to prevent sickness.

Our pigshed should be built on the best drained part of our land. For 2 or 3 pigs our pigshed should be 2 x 2½ meters, with a height of 1½ meters in front and 1 meter in back. The front must be open to the sunlight, which is a good disinfectant. In front or at the back there should be a small fenced yard, or pigpen, about 2½ x 2½ meters. The pigshed can be built of bamboo, cogon and nipa, but must be

strong enough to keep the pigs from escaping. The pigpen also needs a strong fence. (Fig. 63).

If we wish to keep the pigs under the house, we can build the piggery the same way, but we do not need the roof. (Fig. 65).

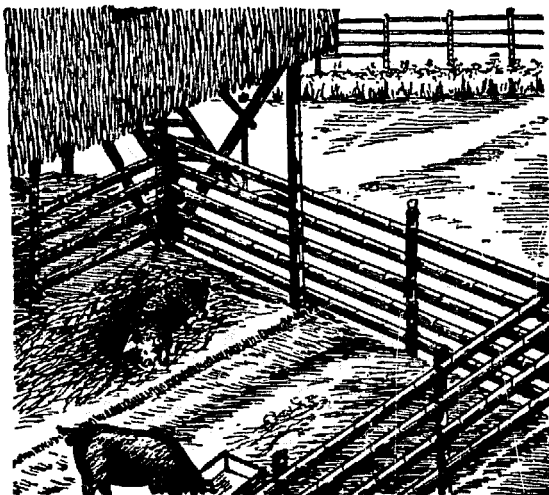


Fig. 65. A sanitary pig shelter under house.

Flooring: For the SAMAKA farmer, the easiest and cheapest floor for the pigshed is made of Mother Earth. A good clay, which we can pack hard, is the best material, as it is easier to keep clean. We then place on this dirt floor clean dry litter, such as straw or dry banana leaves, or similar material.

After the litter gets dirty, we change it, but we should always place the dirty material in our compost pile, as the manure and urine make this litter excellent fertilizer when fully rotted.

Some farmers use home made bricks for the floor of the pigshed. If we do this, it is important to have a large enough pen or yard outside where the pigs can exercise. Successful pig raisers tell us that their pigs are healthier when they get their noses in the ground. That is why we leave the dirt attached to the roots of the weeds which we pull and feed to the pig.

Selecting Our Piglets

It will pay us to get good mestizo piglets, although the best native breeds are satisfactory. In choosing our pig, we should select a lively young pig with long body and short legs. The chunky ones make too much lard. (Fig. 66.)

The pig breeder from whom we buy the pig should supply us with castrated animals, because they grow faster. Also they should be vaccinated against hog cholera and plague, and be treated for worms before we take them. The small extra charge for this service is cheap insurance, because pigs treated this way rarely die from sickness. The vaccination for hog cholera lasts for 8 to 12 months, and for hog plague, 6 months.

Feeding The Piglets

As SAMAKA farmers we should learn the lesson of "How to Feed A Pig Without Buying Feed."

There are certain special feed mixtures for pigs which we can buy at the store, which have various substances to promote growth and health. When we can afford it, it is worth while to add some of this special mixture to the or-

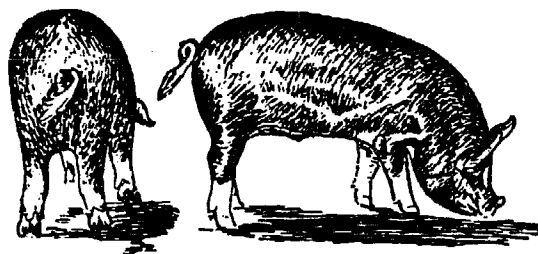


Fig. 66. Long body, short legs best type of pig.

dinary feed. If we later raise pigs for sale, it is very important to add these mixtures so as to increase our profits.

The fresh left-overs from our table and kitchen supply a valuable part of the pig feed. The washings and left-overs of rice and corn, the gills and entrails of fish, the peelings of papayas, bananas, camotes, and all the other scraps, are wholesome hog feed, *if fresh*.

Some farmers who have avocado trees find that during the harvest they have too many fruits to eat, and they cannot sell them at a good price. In that case our surplus avocados can be used for pig feed. They are very rich food for our livestock.

We should all have a corn patch in our SAMAKA garden—the bigger the better—to supplement the pig feed. For pigs to grow well we know that they need three kinds of feed: (1) starch, like rice, corn, adlay, batad, cassava and camote; (2) proteins, like fish entrails, meat scraps, mungo, copra meal, peanuts, and soybeans; and (3) greens of all kinds, which contain some starch and proteins, but also are rich in the minerals and vitamins which every animal must have. The greens also contain the fibers needed for good digestion.

Greens are the cheapest feed for pigs, and many of us do not give our pigs enough. Here are a few of the green feeds recommended to the SAMAKA farmer for his pigs:

Camote leaves or shoots
Kangkong
Talinum
Pechay and cabbage
Grass
Waterlily
Banana stalks
Tapilan
Chopped corn plants
Mango leaves
Bean leaves
Ipil-ipil
Mani-manian
Puñgapong
Kulosiman

These greens also contain valuable amounts of starch and protein, in addition to minerals and vitamins.

Pigs, like human beings, need a balanced diet, the same way that our "kanin" (rice) and "ulam" (viand) should be balanced. Whenever we can get it cheap, we should feed our pig darak or rice bran, when we live in a rice region; shredded coconuts (sapal), if we have coconut trees; and fish wastes if our house is in a fishing district. If we have to buy some supplementary feed for our pigs, corn, corn bran (tahup), camotes, darak, and copra meal are the cheapest. When weeding our garden we can throw these weeds into the fenced pigpen, roots with attached soil included.

Pig Diseases

Pig diseases not only kill our pigs. They may also cause sickness to those who eat the pork.

The most common diseases are hog cholera, swine plague, intestinal parasites and tuberculosis.

Hog cholera is the sickness that kills the most pigs. That is why we should get only piglets which have been immunized against it by vaccination. If we cannot get vaccinated piglets, then we should at once get the nearest Agricultural Extension Man to vaccinate our pigs.

Swine plague is another pig disease we must watch for. A pig suffering from this sickness shows loss of appetite, fast breathing, high fever and coughing. It can be treated with injections.

Intestinal parasites of various kinds attack pigs. If we buy piglets that have already been found free of worms, our pigs can be kept free of them by keeping the pigshed and pigpen clean.

Pigs have the same kind of tuberculosis as people. They may catch the disease from eating human feces, and also when people having tuberculosis spit on the ground and on the pig feed.

The basic rules for keeping our pigs healthy are:

1. Never let our pigs roam around. We should keep them in the pigpen, or tied with a rope.
2. We must keep the pigshed and the yard as clean as we keep our house. Disease grows on filth.

3. We must not give our pigs rotten feed.
4. We should never allow the pigs near an open toilet, where they can eat human wastes.
5. If we have visited our neighbors we should wash our feet before we enter our pigpen, so we will not carry diseases to our pigs.
6. If our pigs get sick, we should notify the Agricultural Extension Man at once. The government pays him a salary to help us control livestock and plant diseases.

Slaughtering

The SAMAKA farmer does not kill a young pig for lechon. He lets it grow to maturity. In this way he will have 90 to 100 kilos



Fig. 67. In killing pig cut the throat only, never pierce the heart.



Fig. 68. Prompt scalding in very hot water.

of meat for his family instead of a 3 months old pig weighing only 10 or 15 kilos.

Killing a hog calls for skill and special equipment. It does not pay for each SAMAKA farmer to get his own materials for slaughtering pigs. It is cheaper and better to get the help of some neighbor who has the skill and equipment. But when our pig is to be slaughtered, there are a few things we want to be sure to remember:

1. The pig should be kept in the pigpen 2 or 3 days before it is killed. It should be given no food for 24 hours before killing.
2. Pigs should never be killed when they are overheated, excited, or tired, but should be perfectly quiet and rested.
3. The butcher should cut only the large blood vessels of the throat. He should never stick the knife into the heart, because that stops the heart from beating. The heart should be left uninjured so it can continue pumping out the blood rapidly. (Fig. 67).
4. Have a large barrel of near

boiling water ready to scald the pig without delay after all the blood has drained from the carcass. (Fig. 68).

5. Chilling the butchered pig is very important. If it stays hot too long, the meat begins to get rotten quickly. As most barrios do not have ice, we must try to get the meat cool in the air. The best way to do this is for us to kill the pig very early in the morning, about 4 o'clock, before the sun is up, and when it is not raining. The pig should be split in half to help it get cool quickly and to remove the animal odor and heat. Then the preserving of the meat should start within three hours after the pig is killed.

Preservation

Many families when they kill a large pig must eat it right away and give it to their friends, because they have no refrigerator. That way the family has too much pork one week, and then no more pork for several weeks or months.

As SAMAKA farmers, we do it differently. We preserve most of the meat in several different ways. We salt some of it, make tapa, and also some sausage. Part of the meat can be made into adobo, which keeps fresh for many days, and part can be pickled (paksiw) which also lasts long. If we follow the SAMAKA method we can have pork from the one pig for many weeks.

From a 90-kilo live pig we can

get 25 kilos of legs and shoulders, 20 kilos of side and loin meat, and about 20 kilos of sausage meat, lard, pig feet, etc. That makes a total of 65 kilos of viand from one 90-kilo live pig, or 195 kilos for three pigs. So if we raise only three pigs a year to full size, and preserve some of the meat, we are assured of nearly 4 kilos of pork meat *every week, all the year*.

Unless our SAMAKA leader or someone else in our neighborhood is skilled in making hams and bacons, the easiest way to preserve the meat is by salting. Salt pork can be used in many ways. Boiled with mungo or beans it is a tasty dish. It can be soaked in water first and used in our adobo. It is a good addition to our gulay.

We can also preserve all the small pieces of meat, the heart, liver, tongue, backbone, feet, trimmings, and spare ribs by putting them in a glazed stone jar (gusi) and covering them with a pickling solution. When we are ready to eat it, we take a piece from the jar, wash it, and cook it in the ordinary manner.

If we want to make sausage meat, we can also take pieces from the pickling solution, so we do not have to make the sausage all at one time.

It is a good practice to cut off from the meat all the extra fat and make it into lard. This is good for two reasons. First, fat will become rancid quickly and that gives the meat a bad flavor, unless most of the fat is first removed. Second, if we make lard,

it gives us abundant cooking fat for our kitchen.

How To Salt Pork

First, prepare a suitable jar (tapayan) as container. It should be thoroughly scalded with boiling water before it is used.

Second, prepare the ingredients by measuring 6 cups of salt, $1\frac{1}{2}$ cups brown sugar, and $1\frac{1}{2}$ teaspoons of saltpeter (salitre).

Third, pour water into a clean petroleum can two-thirds full, and boil it. While it is still warm dissolve the ingredients and stir thoroughly. While waiting for the salt mixture to cool, prepare the meat by cutting it into suitable pieces, say, the size of the palm, or bigger or smaller, as we may prefer. The meat may be with fat and skin, or lean meat alone.

Fourth, wash the pieces of meat with plain water and drain.

Fifth, pack the pieces of pork into the jar. Pour enough of the salt mixture over the meat to cover it with the salt solution. Cover the jar with a piece of board and set aside in a well-ventilated room to cure for eight days. At the end of the curing period the pork is removed and placed to dry for three successive days under the sun. Afterwards wrap it well in banana leaves and store in the kitchen cabinet or any other food storage place, to be used from time to time. The meat thus prepared can keep well for sixty days or longer.

Before using or cooking the salted meat, we usually soak it in water for half an hour or more,

changing the water at least twice. This is done to remove any excess of salt, as individual tastes vary.

How To Pickle Pork Pieces (Paksiw)

When we kill our pig for preserving we will always have a surplus of trimmings and small pieces, such as spare ribs, feet, backbone, heart, liver, tongue, etc. Here is a simple, easy way of preserving these pieces in pickling solution until we are ready to use them.

Clean the pork pieces thoroughly and boil them until cooked. Salt to taste when about half done. Pack tightly in a container (stone jar preferred) and cover with hot and sweetened vinegar with spices. Crushed black pepper, ginger, and garlic in sufficient quantities may be used in spicing the vinegar or sweetened vinegar, as our individual preference may decide. Pigs' feet are among the best part for pickling.

Pork pieces stored in the pickling solution will keep for a long time without spoiling. We can fry this pickled pork in butter, use it to season our soup, or make it into sausage meat.

How To Dry Pork (Tapa)

Mix four handfuls of salt with one handful of brown sugar. Cut the clean fresh pork into thin steaks of suitable sizes. Sprinkle on both sides of the steaks a generous amount of the mixture of salt and sugar that we have made. Pack the salted pork into a container. Pour on it enough hot spiced vinegar to cover the

steaks. One tablespoon of toyo may be added if desired. Let it stand for a night. The following day dry the meat under the sun for one day. Turn the steaks or tapa now and then while drying. After drying, place the dried pork in a basket hung from the kitchen ceiling, preferably over the stove. The basket should be an open weave kind that allows the air to pass through.

Pork Sausage Made At Home

After the pork meat is chopped fine enough, containing 2 parts lean meat and 1 part fat, measure it in a cup. For each 10 cups of sausage meat add the following:

½ cup fine salt.

¼ cup brown sugar (if you like the somewhat sweet sausage).

2 teaspoons of ground black pepper.

2 teaspoons of chopped fine garlic.

Mix this seasoning thoroughly with the chopped meat, and it is ready to fry. The sausage meat may be cased or placed in the small intestine of pigs and linked into proper lengths by tying with abaca or cotton thread. Dry the sausages under the sun for one or two days and thereafter hang them in the kitchen. In using, cook with a little water in a frying pan. Serve hot.

The sun-dried sausage, stored in the kitchen, will keep well for a month or more. When we make a lot of sausage and want to keep it a long time, we find that by covering the sausage in a jar of very

hot lard, we can store it for 4 or 5 months.

How To Make Lard

To make good, white lard that will stay fresh a long time we should make it the same day the pig is killed. We have to keep everything very clean and sanitary.

The fat should be trimmed as soon as the carcass has cooled, and placed in a clean place, where it can be cut into small pieces. If the pig has been properly scraped, we can leave the skin on the fat.

Then we place the pieces of fat in a large kettle or kawa over a medium hot fire. A little clean water should be put in the bottom of the kettle when we start cooking. We should not fill the kettle too full or it will boil over. If we add a pinch of cooking soda (bicarbonate) to the fat when we begin cooking it, the cracklings will become darker but the lard will be whiter. The fat should be stirred frequently. Cooking should be very slow until the fat has started to melt and can be easily stirred.

The cracklings will first come to the top and float. When most of the lard is extracted from the pieces of fat, the cracklings will sink to the bottom of the kettle.

We should let the lard cool somewhat in the kettle. Then it should be poured into dry jars or cans which have been washed and kept for 10 minutes in boiling water to sterilize them, and then put upside down to dry without wiping. Cover the jars or cans immediately and store the lard in a cool dark

place. When we have drained the lard from the cracklings, the cracklings also should be placed in clean jars or cans for future use.

Making Ham and Bacon

The salting and pickling of our pig meat as just described is not the same as making good ham and bacon. To make good ham and bacon we must have special knowledge and equipment. None of us raising only 2 or 3 pigs a year can afford to do this himself.

But if the SAMAKA farmers of our group want to make ham and bacon from our pigs, it can be done by having our Assistant Leader In Charge of Pig Raising become our expert in making ham and bacon.

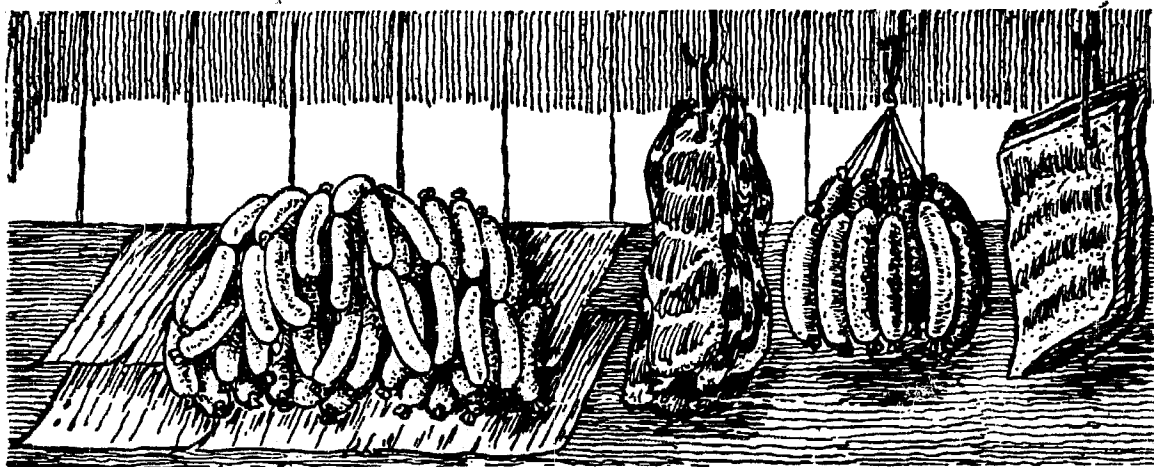
If we select a leader for this, arrangements can be made to send this assistant leader to the Bureau of Animal Industry or some other ham-making center for a short course of instruction.

After that we can have ham and

bacon which will stay fresh a long time and taste as good or better than the imported kind.

Our Assistant Leader In Charge of Pig Raising should have all the necessary equipment, tools, and preserving materials. When several of us SAMAKA farmers are ready to kill our mature pigs, we agree with the leader on a day. The pigs are weighed and slaughtered, and the curing is done under the direction of the expert leader, with each owner of a pig helping in the work. The leader will be given in payment for his services and materials used a share of the cured meat.

After we have raised 2 or 3 large pigs a year, some of us may decide to breed pigs from our own sows, and sell our pigs for profit. There are many books available to help us in such an enterprise. But it will probably be better for us to try the SAMAKA way first, as that experience will be very valuable to us.





Rabbit—A New Meat Food For Filipinos

The rabbit is an animal so new to the people of this country that there is no name for it in the Filipino language. Some use the Spanish word "conejo" but most people now use the English word "rabbit." In recent years more and more farmers have been raising rabbits for food, so now we can learn from their experience.

The rabbit is a small animal, not much bigger than a large cat. Its meat is delicious. It tastes something like chicken, and the flesh is firmer.

One reason why Filipino farmers who have tried it like to raise rabbits is that they multiply so quickly. Starting with 1 male (buck) and 2 females (does) we can easily have 40 or 50 rabbits in a year. That is about one meal of rabbit meat every week of the year.

Other advantages of rabbit are the following:

1. They are not attacked by many diseases.
2. Their feed consists of the green things and extra vegetables we grow in our gardens, so we do not have to buy feed for them. They should also be given rice bran (darak), corn meal, copra meal, mongo or soybean in places where the farmers raise these crops.
3. As soon as we have tried raising rabbits we will find that they are easier to raise than chickens.

How To Start Raising Rabbits

If there are no rabbits in the barrio, the best way for SAMAKA farmers to start raising rabbits is for about 20 of us to get together and collect enough money to buy, for instance, 2 males and 12 females from a rabbit breeder or

from the Bureau of Animal Husbandry. They will cost between ₱5 and ₱10 each, or from ₱70 to ₱140 for the 2 males and 12 females. That means that if there are 20 in our group, each of us has to contribute ₱3.50 to ₱7.00 as his share.

When we have decided to raise rabbits this way, we must choose one of our group as Assistant Leader For Rabbit Raising. He must learn all he can about the business and then buy the rabbits with the money we have contributed. Then he lets the rabbits multiply.

About 30 days after our Assistant Leader starts the rabbit breeding, the first baby rabbits will be born. As the males cannot mate with the females more than 2 or 3 times a week, it will take several weeks before all of the females produce young. Each female gives birth to 5 to 8 baby rabbits, so our 12 females will produce about 80 young rabbits. About half of the young will be males and half females. When the baby rabbits are 8 weeks old, they can be taken from their mothers, and each of the 20 in our group will get 1 male and 2 females, and we can soon start breeding our own rabbits. We will have observed what our leader has been doing, so we will know how to follow his example. We will have to wait about 6 months for our rabbits to reach a good age for breeding, but in 7 months after we receive them we should have 2 females giving birth to 10 or 15 young rabbits, and we will be well started on the

road to more abundant meat for our family.

What will our Assistant Leader For Rabbit Raising get for all the work he has done in producing the first litter among us? We do not want him to work for nothing so we let him keep all the male rabbits except the 20 distributed to us. So he will have 20 males for himself plus the 2 females which are his share. He will raise these extra males to large size for sale as meat. Meanwhile, we will observe if our males are good breeders. If not we can exchange it for a better one with our leader.

The 20 males kept by our leader will weigh about 1 kilo each in 6 weeks, which he can sell as meat for ₱40 right in the barrio. If he lets them grow larger, he can sell them for more. Also many other farmers in our barrio will see our success in rabbit raising, so our leader can sell some of his share as breeding animals, instead of killing them all for meat.

By following this cooperative method each SAMAKA farmer will have a permanent supply of fresh rabbit meat for his table after only one year.

The Bureau of Animal Industry has a special bulletin called "Questions and Answers on Rabbit Raising," which you can get through your Agricultural Extension Man.

How Do We Cook Rabbit Meat?

We can cook rabbits the same way we cook chickens, fry the young ones and boil or make a stew of the old ones. We read one

recipe which is given below:

After cleaning and washing the rabbit, cut it into pieces about 3 inches square. Put it in a jar and cover it with vinegar and water, to which you add sliced onions, bayleaf, pepper, spices and salt. Let it soak in

a cool place for not more than 1 day.

Then you take out the rabbit meat and dry it. Next you fry it in lard until it is a dark brown color. Gradually you add the vinegar you soaked it in and cook it slowly until tender.

Let Us Raise Goats On Our Homesite Farm

Glossary or Dictionary of Goat Raising Terms

Billy goat — Male goat

Buck — Male goat

Chevon — Goat meat

Doe — Female goat

Doe in Kid — Pregnant goat

Kid — Young goat, male or female, less than a year old.

Kidding — Process of delivering young by pregnant female.

Milch goat — Milk goat

Nanny goat — Female goat

Stag — Castrated goat, castrated after maturity.

Wether — Castrated goat, castrated at any age.

Why Raise Goats?

When we are tilling a small farm of 2 hectares, we need to produce everything we can. As soon as we harvest our crop of rice or corn, we get the land ready to plant mungo or peanuts or camotes, or some other food crop. In our backyard we are keeping chickens and maybe two or three pigs. We also have a vegetable garden and have planted bananas and papayas and other fruit trees. By using our small piece of land all the time and raising many different things, we are able to feed our children rice or corn, meat and poultry, eggs,

fresh fruits and vegetables, and beans.

But we do not have as much milk as we want. If we are lucky enough to have a female carabao we get some milk, but not every day. We know that our children would grow stronger and resist sickness if we could give them milk or cheese every day.

In some provinces the farmers have been able to get plenty of milk for their family by keeping milk goats. Some even have extra milk to sell in the town, at 50 centavos a small bottle.

In order that the Samaka Farm-

er may add this rich food to his family table, and perhaps make some extra cash income, we have learned from the successful barrio farmers in different provinces how they breed and raise goats, and use them for improving the health and increasing the wealth of their families. Their wisdom has been gathered together in this book so that all of us can produce enough milk and not spend for canned milk.

The Institute of Nutrition tells us that we Filipinos do not eat enough milk products, such as milk, butter, cream and cheese. In

other countries one-quarter of the cost of the family food is for milk products.

Also, most of us do not eat as much meat as our bodies need.

If we keep two or three milk goats we get plenty of these milk products, and the extra young goats can be slaughtered to give us frequent delicious additional meat for our table.

The shortage of goats has always made it difficult to get enough goats for our fiestas, but those of us who have been fortunate enough to have goat stew (caldereta) and barbecued goat



A well-formed native milk goat.

(lechon na kambing) at a fiesta will always want to have it again. Goat meat, which is also called "chevon," is a real delicacy.

So let us add milk goats to our Samaka farm as soon as we can get some female goats to start with.

Procuring Milk Goats

The native goat that most of us know about does not produce much milk. The imported milk goats are especially selected because they produce plenty of milk, but they cost too much for most of us. The best thing for us to do, there-

fore, is to select the best native female goats we can find, and try to get our Agricultural Extension Man to lend us a selected male breeding goat to improve the milk production of the offspring. If each year we select only the best females for milking, and discard the undesirable ones, in a few years we will steadily improve the milk yield. This kind of breeding is called upgrading. If enough of us in the barrio decide to raise goats for milk, we can be more certain of getting a government breeding goat sent to our barrio to improve our native goats. Es-

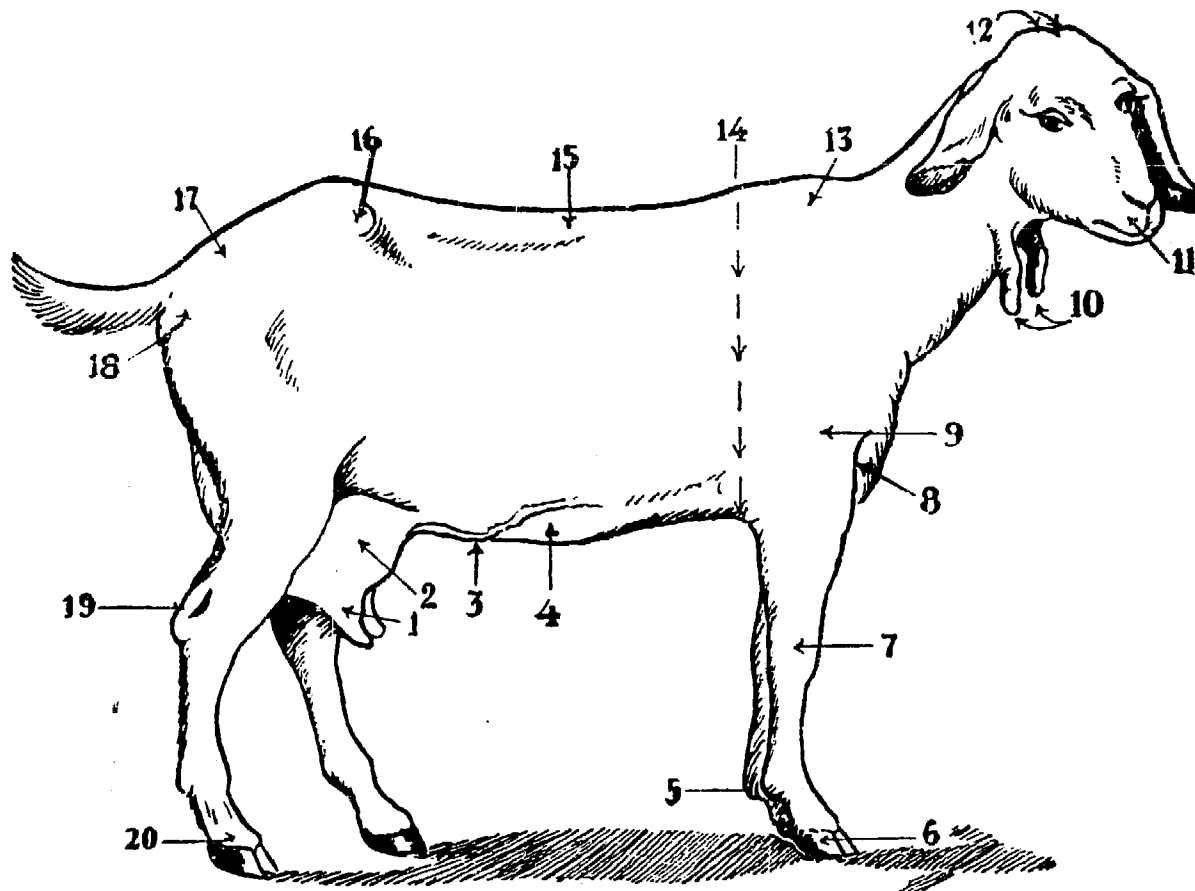


Fig. 69. Diagram showing parts of the goat's body.

- | | | | |
|--------------|-------------|-----------------|--------------|
| 1. teats | 6. hoof | 11. muzzle | 16. hip bone |
| 2. udder | 7. knee | 12. knobs | 17. rump |
| 3. milk vein | 8. chest | 13. withers | 18. pin bone |
| 4. belly | 9. shoulder | 14. heart girth | 19. hock |
| 5. claw | 10. wattles | 15. back | 20. pastern |

pecially is this true if the people of our barrio get together and decide to adopt milk goat production as a community custom.

Of course our neighbors with good female goats will probably not be willing to sell us mature animals. In that case it will be cheaper for us to select young females about 4 months old, and raise them to breeding age, which is 15 to 18 months old. Well developed female goats can be bred as early as one year old. If some nearby barrio has previously adopted the raising of milk goats as a community custom, we will be able to get a better supply of young female goats to start with. We should always try to procure the goats we start with from a goat raiser who is known to have healthy animals that yield more milk than others.

How To Select Milk Goats

In selecting native milking goats for our Samaka farm, there are a few points to consider.

To start with, if the female goat is known to produce more milk than others in the neighborhood, we will prefer her.

Size. — A large goat will give more milk than a small one. A female that weighs about 42 kilos and stands 67 centimeters high above the shoulders (at the withers) is a good size.

Personality. — Goats have personality. A motherly, docile expression indicates fondness for young. Getting a goat that is gentle in handling, that is, tame and friendly, is also important. These two

traits are points to consider in selecting a good milk goat.

Body shape. — The udder or milk bag of a good milk goat should be large, wide, and hanging, with uniform large teats. (Fig. 69). The udder should feel soft and yielding to the touch. Just after milking, a good udder appears shrunk or wrinkled and much reduced in size. Like the carabao, goats do not have upper teeth, but only a tough pad. The lower front teeth should be strong, to assure grazing ability.

Here in the Philippines the present variety of native goat grown for milk purposes produces about a half to one liter of milk a day, if she has been selected for her milk production and is given some grain feed. If we steadily improve the variety by selective breeding and "upgrading" in a few years we should double this production. In Europe and India, good milk goats produce 3 liters of milk every day for 7 to 10 months yearly. Prize-winning milk goats often give 6 to 8 liters a day when they start giving milk.

Care And Feeding Of Goats

Once we have decided we want to have milk goats, and have learned how to select the more desirable native goats to start with, we suddenly ask ourselves, "Where do we get the feed for these goats? Will we have to buy feed? Will the green stuff and kitchen scraps we now use for our chickens and pigs have to be given to our goats?"

These are good questions.

Grasses And Shrubbery

Goats are browsers and seem to prefer shrubbery but they can be raised solely on grass pasture feeds grown in well-drained land. With pasture feed alone they will thrive well, and the females will give some milk. But if we want them to produce abundant milk we find it best to add some grain or mash feed. When we are short of grain or mash it will merely diminish milk production, without hurting the goats.

Goats enjoy feeding on a large variety of plant growth. Brush lands and the common pasture grasses afford an ideal combination. If grass only is found, the goats will get along all right. However, they do like shrubbery, and a wide variety. We have often noticed that some days a goat will eat certain plants and the next day will reject them in favor of other plants. The goat seems to know what feed is good for him. Among the plants the goats like are the leaves of raffles, saluyot, ipil-ipil, talinum, acacia, madre de cacao, camanchile, tamarind, aroma, manimanian, gumamela, and talisay. It is a good practice to gather leaves of the talisay and pods of the aroma and acacia, and place them in a dry box or basket where the goats can get at them in the shed. They also like to eat the fresh corn stalks, bean and peanut leaves, and kangkong and camote leaves. Hays made from good grasses and from bean vines are liked by goats and are good for them.

Mixed Feeds

We should try to keep some rice hay or other hay for the goats, to give a little to them early in the morning, when the outdoor plants are still wet with dew. That is why we usually wait until the sun is well up, about 8 o'clock, before we pasture the goats. We never pasture our goats on swampy land. Generally they do not even eat standing rice plants, because of the wet ground.

For grain and mash feed to increase milk production, and also to add to the feed of pregnant female goats, the following mixture has been found very good:

Rice bran	5 cans
Ground corn	3 cans
Copra meal	1 can
Salt and ground shell	1/10 can each.

Goats also like kitchen scraps if they are clean, but they usually refuse to eat food that has fallen on the floor or become dirty.

Goats Help Soil

In coconut groves the goats will be especially valuable, because they keep the brush down without destroying the green grass which protects the soil. But it is not good to keep goats in other kinds of fruit orchards with small trees, because they will eat the lower branches and damage the bark.

A lot of people blame goats wrongly for destroying too much vegetation. Actual tests were made in one barrio. Two pastures were set apart, and cattle grazed in one pasture and goats in the other. At

the end of 4 years the cattle pasture was eroded and topsoil washed away by rains. But on the goat pasture there was no brush, the topsoil was richer, and the grass was as good as at the start.

Tethering And Pasturing

As Samaka farmers we have already learned the lesson of not letting our animals roam around, destroying other people's gardens. Goats should be either tethered in the pasture with a long rope, or herded by one of the children. We never let our goats wander around loose. When not being pastured they should be kept in our back yard or in the shed with a dry floor.

When we pasture our goats we do not keep them too many days at one place. We move them from one part of the fields to another, so that new plants may grow and also to give the goats the variety of growing feed they crave. If we let them loose inside a large fenced pasture, we notice that the goats go from place to place to get the food they need without being guided. When tethered or accompanied, we should let them do the same.

Each goat needs about 1,200 square meters of yearly pasture. That means a section of our fields only 30 meters by 40 meters. So even when we are planting other crops, we can find some place to pasture our goats, even on the roadside, or on the pilapil if the goat is held by a short rope.

But goats suffer much from getting wet. This is more true of the

imported milk goats than the native goats. But even the native goats will be healthier if they are kept out of the rain and are protected from cold winds. So for our two milk goats, we must keep some feed under the house to give them in rainy weather, and also we must gather green feed and bring it to them during heavy rains.

Plenty of clean drinking water is of course necessary for the goats.

If we have a male goat, we keep him away from the milk goats, especially at night and during milking time. That keeps the female and the milk from absorbing the smell of male goats.

Care Of The Hoofs

We find that if we trim the hoofs of the goats every two or three months it keeps them healthier and happier. With a sharp knife we trim off little by little the projecting rim, like we trim our fingernails. Also we must be careful not to cut too far, because we know how much it hurts when we accidentally cut our fingernails too short.

Shelter For Our Goats

Before we start raising goats, we should get a shed or shelter ready, and also have a small yard strongly fenced for the goats to move in. If we do not do this before we get our goats, we may find that they have destroyed our garden and the garden of our neighbors.

We are not starting goat-raising as a commercial operation, but only as an addition to our family sub-

sistence farm, so probably we will only have two goats to begin with.

Materials For Goat Shed

We need a shed for our goats to protect them from strong winds, rain and wet ground, and from attacks by dogs. With these needs in mind, we can build our goat shed of the materials at hand, such as bamboo, with cogon or nipa roof and sides. It can be built next to the poultry shed, and should not be far from the house. (Fig. 70). Some of us find it best to build the goat shed under the house for safety and for convenience. (Fig. 71). A shed or compartment 2 meters wide and 3 meters long is big enough for our two milk goats, but extra space where the young can be kept separated is also important.

Separate Stalls, Dry Floor

Each goat should have its own stall, and the floor should be elevated above the ground to keep it **dry**. We have found a bamboo floor satisfactory, as the slats allow the urine and manure to fall through to the ground below. If our platform is low, it should be on a separate frame so it can be removed now and then for cleaning the dirt or cement floor underneath. The pictures here shown will give us some useful ideas on how to plan our goat shed.

The partition between the stalls should be strong enough to prevent the goats from knocking it down when they try to butt or bump each other, even in play.

We should see that a feed box

has been placed near the gate of the stall. This is for the salt, hay and grain mash, and aroma and acacia pods we feed to the milk goats.

Milking Our Goats

The important thing we must remember in milking the goats is *cleanliness*. We want a clean dry place to do the milking, so dirt will not get into the milk. Before we start we should brush the goat carefully, so that no loose hairs or dirt will fall into the milking can.

If we have the elevated goat shelter, with the floor a meter above the ground, we can place the milk goat in front of her stall and milk her while we stand. (Fig. 72). If we prefer to squat, we can bring the goat down to the ground level. (Fig. 73). We find it convenient to have the goat's neck held between two upright or X-formed bamboos, to keep the goat quiet. The X-holder is easy to build, and is shown in the picture. (Fig. 74). This holder will also be useful when we are brushing the goat or trimming her hoofs. If we put a feed box or basket with grain in front of the holder during the milking, it helps to relax the udder.

Goats get accustomed to being milked from the same side. Milking on the right side is the more customary.

Many of us are accustomed to milk the goat from the rear. The chief disadvantage of this method is that the goat might drop something dirty into the milk can.

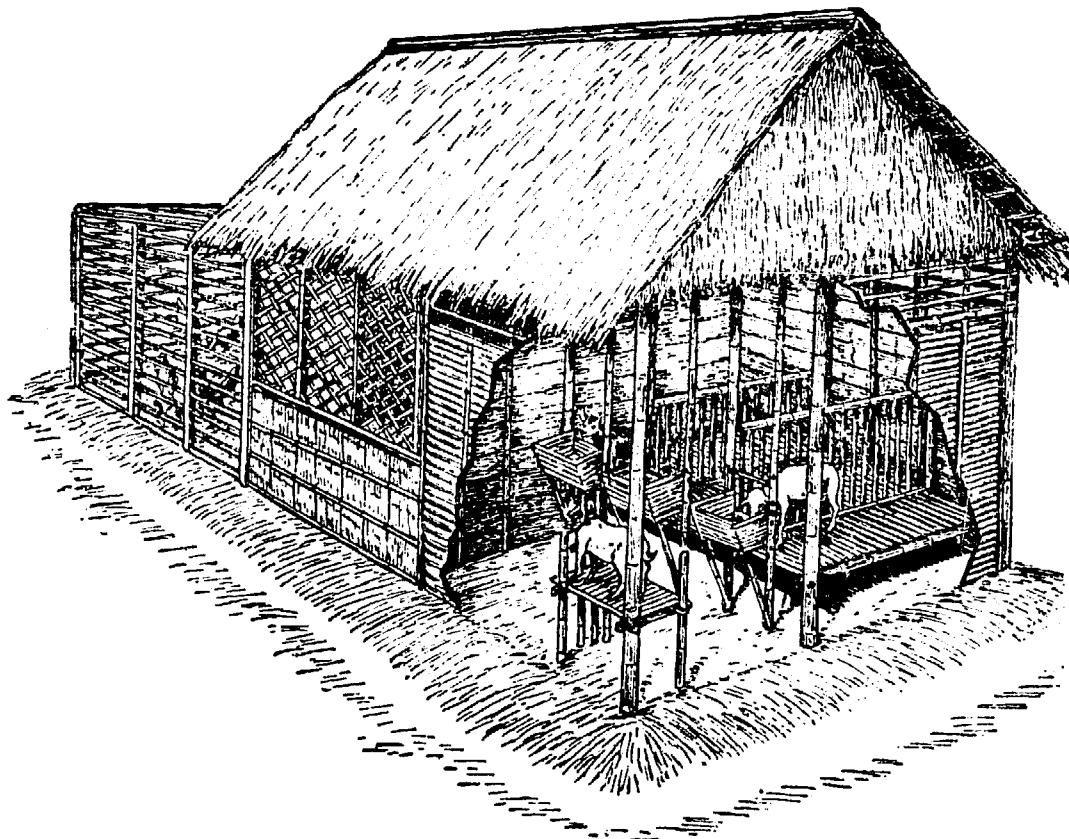


Fig. 70. Suggestions for a goat shed next to poultry shed.

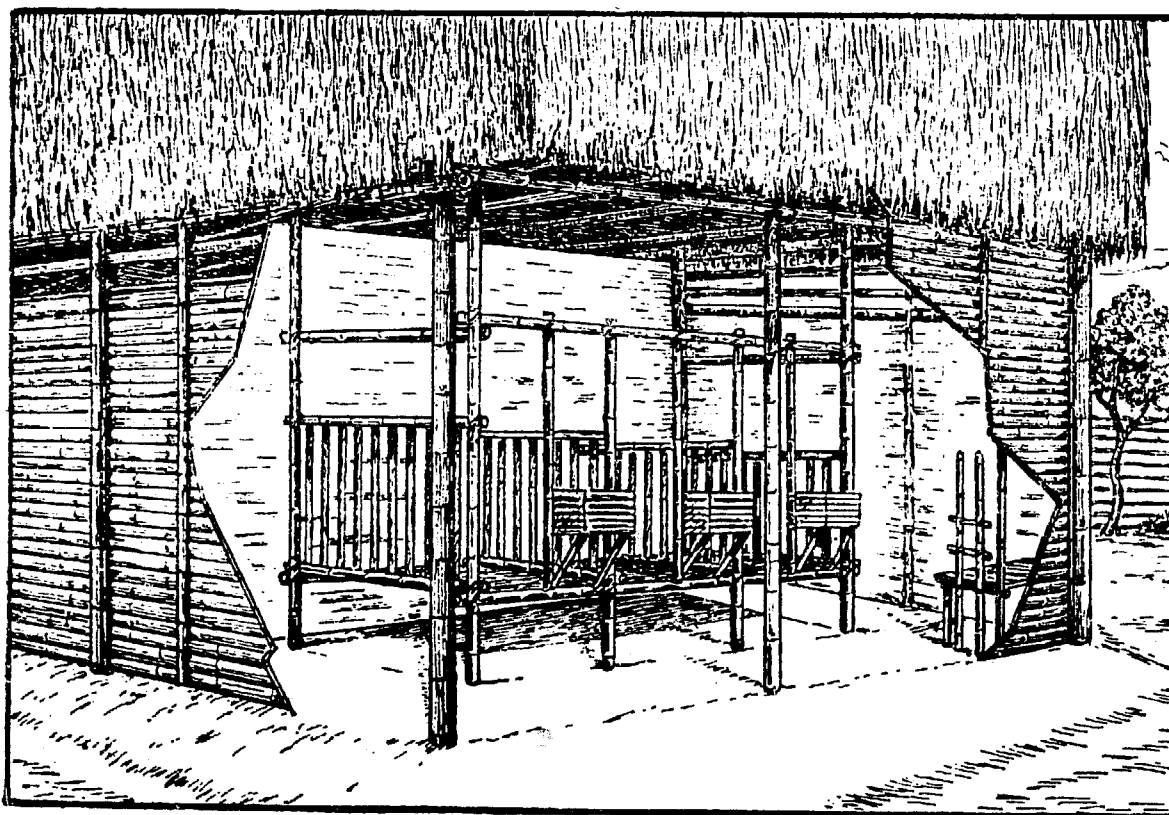


Fig.71. Many farmers prefer stabling goats under house, for greater safety.

Goats are sensitive to changes in ownership and it takes them several weeks to become accustomed to a new location and new people. In fact, they become so attached to people that they give more milk to the person who has cared for them at the time they bear their young. They give the milk easier if the same person does the milking. It is necessary to keep dogs away. Even visitors around at milking time may cause the goat to hold back her milk.

Most of us know how to milk cows or carabaos, so milking a goat will be easy. If milking is strange to us, we can visit the milk goat raiser and watch him when he is milking. It is easy to learn by following the procedure illustrated here. (Fig. 75 and 76).



Fig. 72. Milking goat on elevated platform.

We should use both hands from the beginning, and keep a firm hold even if the milk goat tries to move around to test us. But by pressing our right shoulder against her right leg she will learn to stand steady. It also helps to have a bamboo rail or fence close to her left side, to keep her from moving away from the milker. When we think we have taken all the milk, we should nudge her udder a few times and some more milk may flow. Finally, we press our fingers down the teat to squeeze out the last drop.

Before we start the milking we must wash the udders with *clean* warm water, and also wash our hands with plenty of soap and water. The udders and teats should be dried with a *clean* cloth.

We all know that the milk pan into which we collect the milk should be cleaned first with soap and water and then rinsed with boiling water.

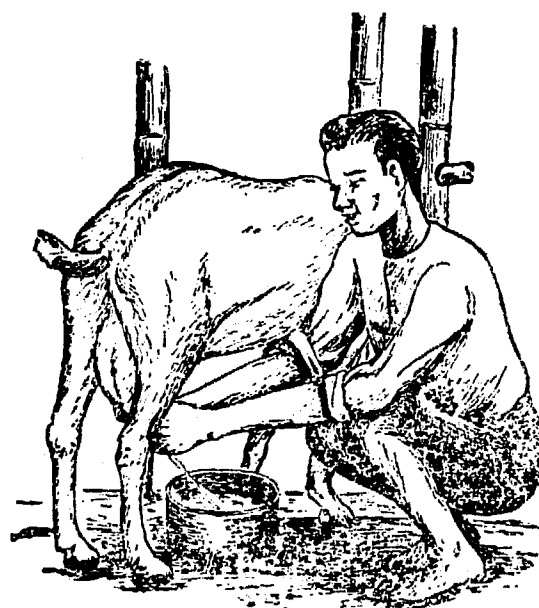


Fig. 73. Milking goat in squatting position.

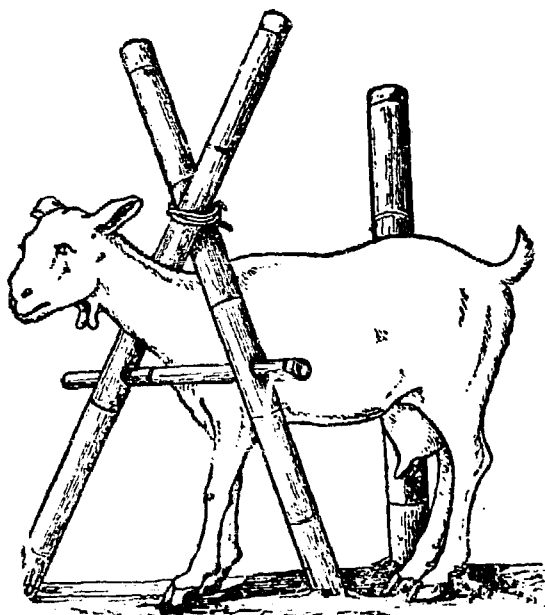


Fig. 74. X-holder to keep goat in position.

After we milk the goat we transfer the milk to *clean* glass jars or bottles with covers that have been cleaned with soap and water and rinsed with boiling water. The milk will keep fresh longer if we set the bottles in cold water at once, so the milk will get cool more quickly.

We must always remember that when we start the milking, the first stream of milk from each teat should be squirted away.

Milk Producing Period

The period of the year during which goats produce milk begins about the time the female goat gives birth to her young, until a few months after she has become pregnant again. This is called the "lactation period." It may run for as short a time as 3 months or as long as 10 months.

We begin milking the goat when the young are born, and stop two

or three months before the goat is ready to give birth again.

How To Milk Goats

In milking goats we should follow the same procedure each time. This causes the goat to give milk more freely. We must be gentle, and not allow strangers or dogs around to make the goat nervous and hold her milk.

1. After the milk bucket is ready we wash our hands with soap and water.

2. Next we wash the udder of the goat with a clean cloth. Warm water is preferred. The washing of the udder should be done immediately before the milking. The hands and udder should be dry when the milking begins.

3. The milk in the teats can go back into the udder or down into the milk bucket. So first we close the thumb and first finger around the teat, so the milk will not go back to the udder.

4. Next we close our second finger, and that should cause the milk to squirt out. We discard the first squirt, as it will not be clean.

5. Next we close the third finger. We use steady pressure, and we do not jerk the teat down.

6. Finally we close our little finger and squeeze with the entire hand until the milk has come out.

7. Now we release the pressure of our hand on the teat and open our fingers, so that the teat can again fill up. We repeat the process with the other hand on the other teat, and continue alternately until very little milk comes.

8. When the milk flow becomes

very slight, we nudge the udder to see whether the goat has released all of the milk in her udder. Sometimes the nudge will release more milk into the teats.

9. The final drops of milk should be "stripped" or squeezed out. To do this we take the teat between thumb and first finger and press firmly.

10. We run the pressed fingers down the length of the teat. This final milk is very rich, but we should not prolong this final squeezing as it harms the teats.

More About The Milk Producing Period

The period of pregnancy is about 5 months, or 148 to 152 days. But when the goat's pregnancy is well advanced, she becomes dry, that is, she stops giving milk. This is necessary so that she can use her strength for producing her young. Most female goats quit producing milk about three months after they become pregnant. If she continues to produce milk we should help her

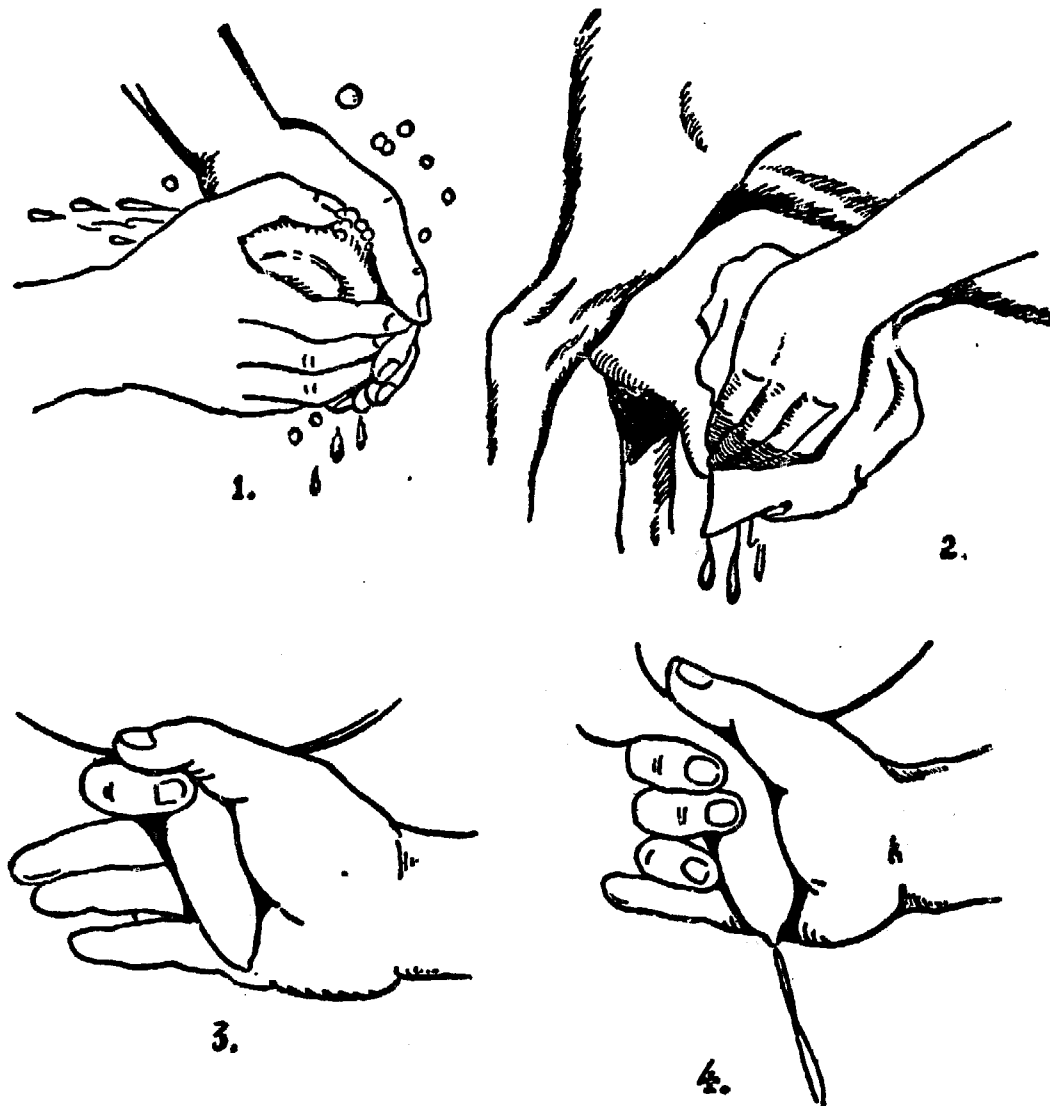


Fig. 75. First steps in milking goat.

become dry, by milking only once a day, then every other day, and gradually less often until the flow of milk stops.

Milk Feeding Baby Goats

Many of us do not get as much milk as we should from our goats, because we let the young goats take milk from the mother goat when they are young. We have found it more advantageous to take

the baby goats from the mother right after they are born, and feed them from a pan with the milk we take from the goat. We teach them to feed from the pan by dipping a finger into the pan of milk, and letting the baby goat lick it. The baby goat learns to follow the finger down to the milk in the container and take the milk unaided.

The first milk is somewhat yellow, but we do not throw it away,

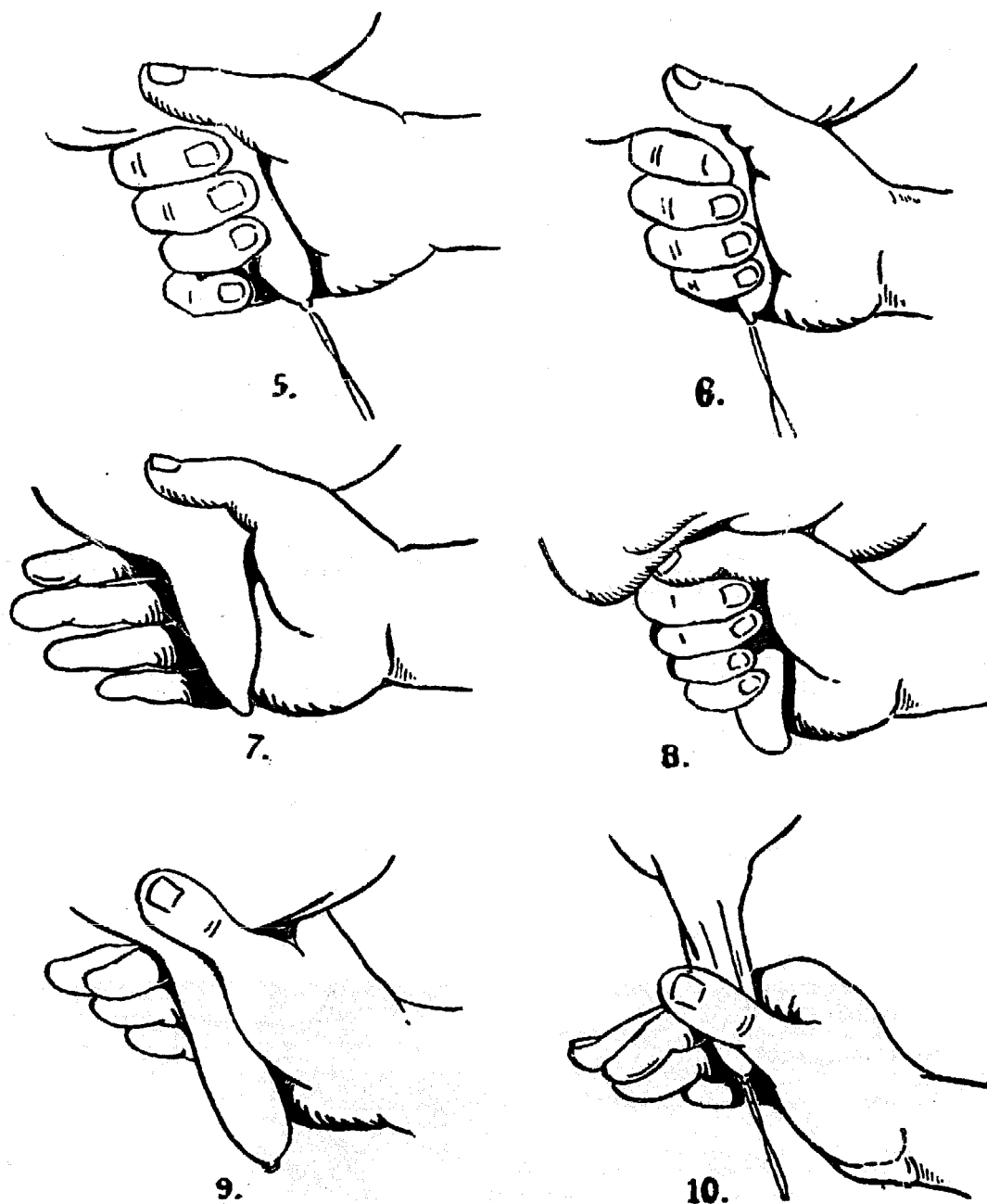


Fig. 76. Further steps in milking goat.

because it contains a substance that newly born goats need for their health. If the baby goat will not take it at first and it gets thick, we should warm it carefully and if necessary thin it somewhat by adding a little clean warm water.

We do not use such milk for human consumption for several days after the birth of the young goats. We take all the milk from the udder and offer it to the newly born goats and use the excess for feeding to the chickens or hogs. In five to seven days after the goats are born we can start the regular milking for our household milk supply.

If, instead of pan feeding, we follow the old method and allow the mother goat to nurse her young, we place the mother and the young together the first three days. On the fourth day we start milking, early in the morning. We separate the young from the mother beginning the fourth night, and then put them together again all day *after* the milking, and then separate them again late in the afternoon. If we notice that the udder seems full after the baby goats have had their share, we may find it wise to milk the goat in the afternoon.

Twice Daily Milking

After the young are weaned we milk the goat twice a day. We have found that goats produce more milk if we milk them twice a day, early in the morning and about 12 hours later, in the evening. This will mean for most of us, six o'clock in the morning, as

the task will be entrusted to one of the older children, who will do the milking before going to school.

The milking period of female goats may run from 3 months to as long as 10 months. A period of 7 to 10 months is good.

Life Span Of Goats

A female usually gives birth to two young, frequently three, and sometimes four. We should count on an average of two each season.

The life span of a milk goat extends to 12 years or more. Her best milk production is during the ages of 4, 5, and 6 years. A male is good for breeding until he is 8 years old. Milk goats are seasonal breeders in northern countries. In the Philippines the goats may become ready for breeding any month. However, it is best not to let them breed during the 5 months before the rainy season, so that the young will not be born during the heaviest rains. Each of us must make our own breeding calendar, according to the climate of our town. After the female has produced young and has been milked for several months she gradually becomes dry, and we have to mate her with a male goat in order to "freshen" her. Therefore, we try to select our milk goats so that they will have different breeding seasons. This way all of them will not go dry at one time, and deprive us of milk.

Raising The Young Goats

If we wish to make our milk goats produce the greatest yield of milk, we do not let them nurse

the baby goats at all. However, some of us will continue the old practice of letting the baby goats take their milk from the teats of their mother. In both cases we will have to wean the young, so that when they are three to four months old the milk feedings can be discontinued.

The milk-feeding by hand should at first be four times a day, about a glassful of milk at a time, and the milk should be warm. After a few weeks we can reduce the feeding to three times a day. If the mother nurses her young, we should leave them together so the baby goat can suck milk whenever it is hungry.

Even when newly born goats are a week old they will nibble at straw, and we usually start feeding them hay and a mixture of rice bran, corn meal, and copra

meal when they are three weeks old.

In the section of the goat shed set aside for the young goats, we should pile dry straw thickly for them to lie on at night at first, so they will keep dry and not get cold.

Goats for Meat

If we decide to keep only two or three female goats for milk, we will still be adding young goats, because of reproduction. Unless we mate the milk goats to a male they will not produce milk. The offspring of this mating, both the young male goats and the female young which we do not keep for milking, should be raised for meat. They can grow well on pasture food, and the only time we will have to feed them is when it is raining too hard for them to graze out in the open.

Care Of The Hide

The hide of the goat is a valuable product. The United States imports more than sixty million (60,000,000) pounds of goatskins every year for making shoes, pocketbooks and other leather articles.

The hide may be air-dried by hanging it over a fence, flesh side up. It should be kept stretched in a well ventilated place until it is very dry. In rainy or damp weather we find it better to preserve the hide with salt. We rub *fine* salt into the fleshy side of the skin and allow it to cure.

When we slaughter only two or three goats each year it will not be worthwhile for us to try to make it into leather. Instead we should dry or salt cure it as here described and sell it to a tannery agent, who will pay about ₱1.00 for each goatskin of the ordinary Filipino goat.

It is very important that we castrate the males we raise for meat when they are about a week old.

Most farmers do this by cutting off the tip of the bag or scrotum, and pressing so that the testes or eggs come out, which are then bitten off or cut off to separate them from the body. If we have tincture of iodine or pine tar, it is good to disinfect the wound.

If we let the male get too big, it is better to call on the municipal agriculturist or other expert to do the castration.

The advantage of castrating male goats is that they produce sweeter meat and grow larger. Also they can be kept with the female or milk goats. Especially if you have only one milk goat, it is good to have a castrated male, because goats suffer when they are lonely.

The best ages for slaughtering goats are between 8 months and 2 years. They reach their full size by 2 years, so it is no use keeping them longer. Of course when milk goats get too old, i. e., after they are 6 or 7 years old, they yield less milk, so we replace them with new females we have selected because of their better qualities. During our early years we may be continually selecting new female goats which have been mated with a fine breeding goat, so as to get offspring with more milk production. The older milk goat will then be replaced by her best offspring, and so on successively, until our race of goats is better and better, both in size and in milk production.

We will also want to slaughter

for meat any females which after a season show they do not yield much milk.

Slaughtering Goats

Many people prefer young goats for meat, saying they are more tender and have a sweeter flavor. But often the flavor of the meat is spoiled because breeding males have been allowed to mix with the females and the castrated males. Also, if the hair of the goat rubs against the flesh during the skinning, it may give a bad taste to the meat.

We slaughter goats differently from pigs. The outer skin or hide, covered with hair, is removed before we cut the goat open to clean it. The skin is removed carefully because of its value as leather and because we want to keep the hair from touching the flesh. Only after the skin or hide is removed do we start taking out the entrails and butchering the animal.

The goat is given no food but plenty of water for 18 to 24 hours before it is killed, so we keep it tied in its stall. When everything is ready for the slaughter we brush the goat very well to get the dirt out of its hair.

First step: We have the following things ready (Fig. 77).

(a) A strong bamboo or wooden table; (b) A sharp knife; (c) An iron hook; (d) A coil of rope; (e) A pan.

Second step: We place the goat on the table on its side. Someone holds the legs. The butcher presses down the head with one hand. With the other hand he sticks the

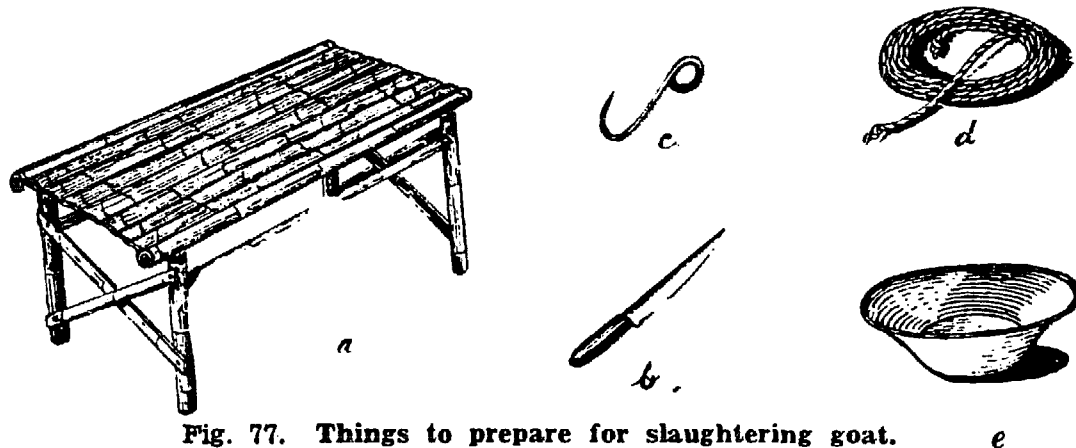


Fig. 77. Things to prepare for slaughtering goat.

point of the knife in the throat behind the jaw, blade pointing out, and by a single outward movement he cuts the blood vessels and bleeding begins. (Fig. 78).

Third step: After bleeding, the goat is placed on its back and its

hide is opened by ripping. We must be careful not to cut or tear the thin membrane under the hide. (Fig. 79).

(a) From the neck to the point of the jaw, we run the knife and then skin the head. We remove the

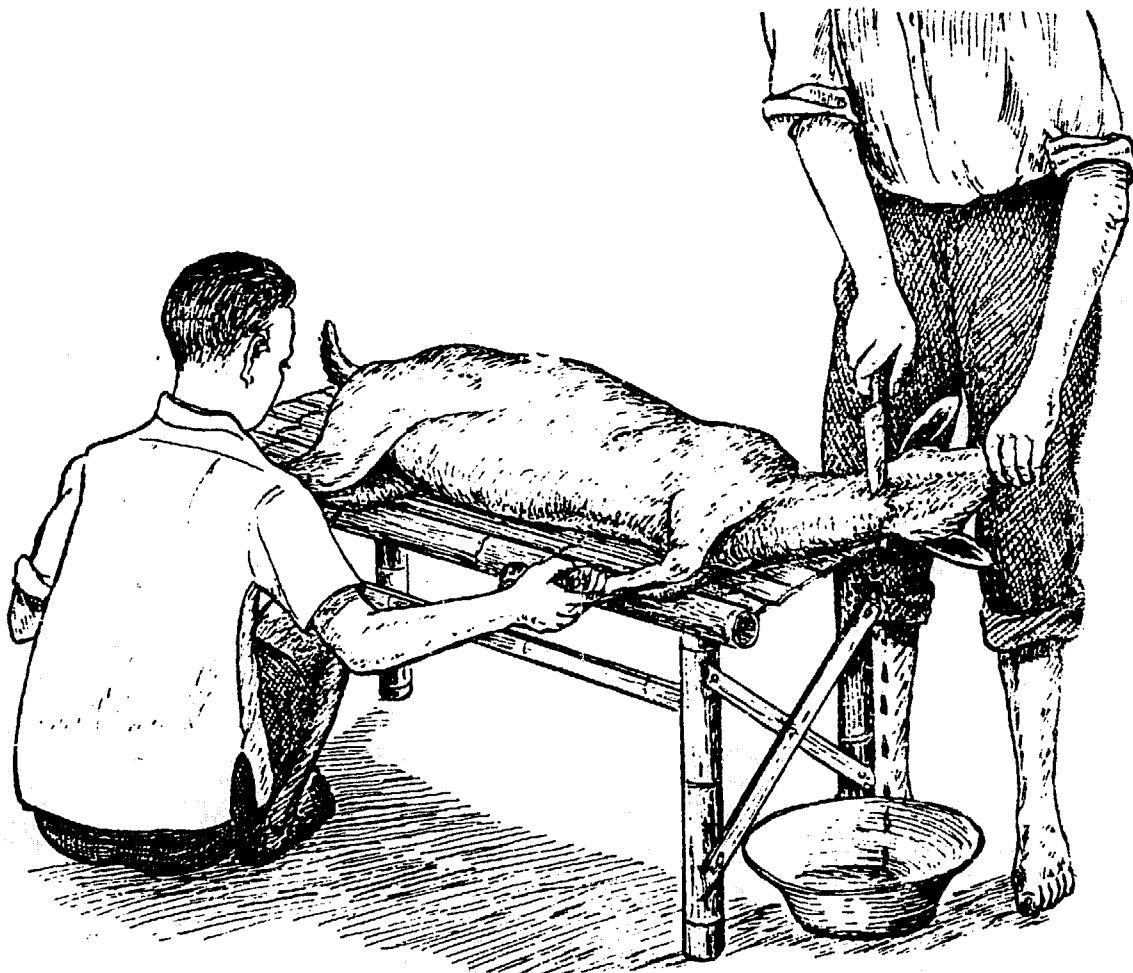


Fig. 78. Killing the goat by cutting throat.

head at the first joint of the neck, and wash it in cold water and remove the tongue and brain.

(b) Next we cut skin down to the breast bone. We pull the skin backward to the point of the breast and over the neck. With a bolo or saw, we cut the breast bone apart.

(c) Then we cut inside of the front legs and rip the skin loose.

(d) Next we cut inside the hind legs and rip the skin loose.

(e) A cut is made around the rectum or anus, and the opening is tied to keep the material from coming out.

(f) The hoofs are cut off.

(g) The goat is hung from the hind legs on a hook. (Fig. 80).

Fourth step: We start loosening the hide by pressing our fist between the hide and the breast

and then between the hide and the belly. The hide must always be removed downward from the shoulder and upward from the hind legs. (Fig. 80).

Fifth step: We rip the skin down the middle of the breast bone and push it back, using our fist the same way, until finally the entire hide falls off. (Fig. 80).

Sixth step: Now we are ready to clean the carcass. With the knife we make a cut in the belly, and open up the belly to remove the entrails. We start by cutting loose the rectum. (Fig. 81). We then tie a string around the bladder. Then we cut loose the wind pipe and gullet at the throat, and finally we cut around the diaphragm. This way all of the insides or entrails can fall out together. After

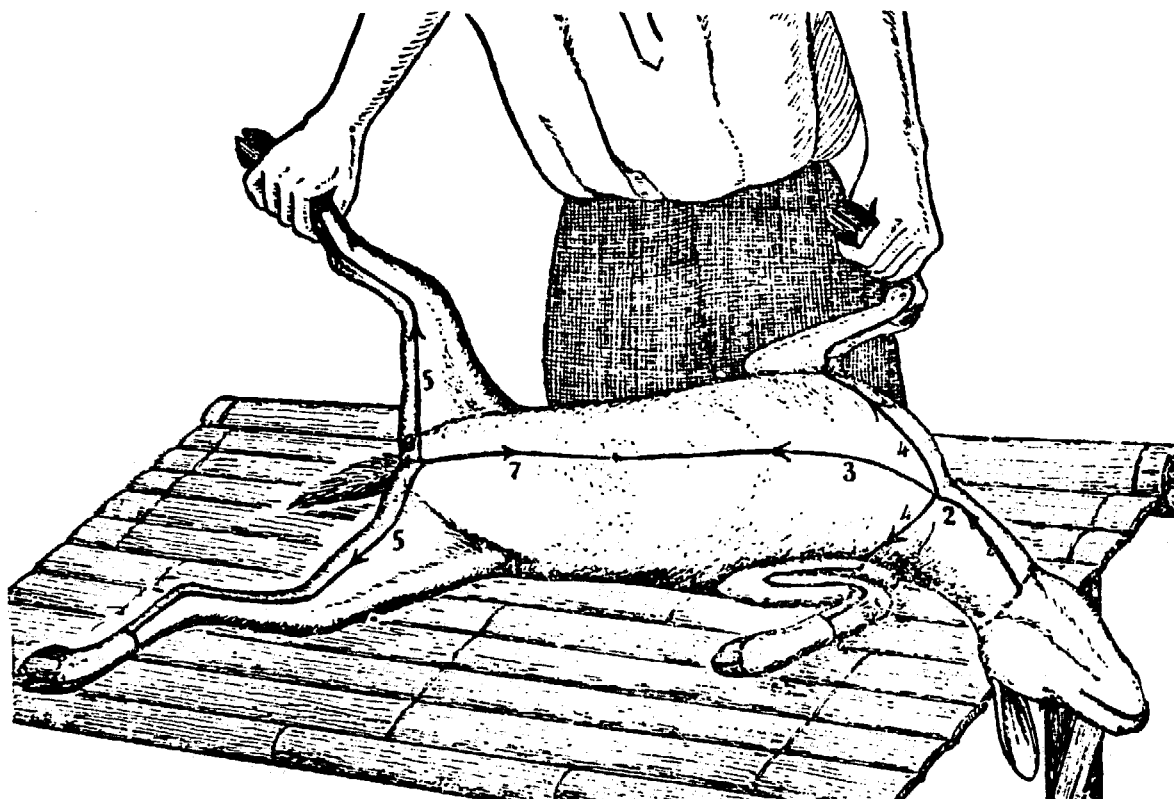


Fig. 79. How to cut the skin of a goat before removing skin. Follow the numerical order of the numbers.

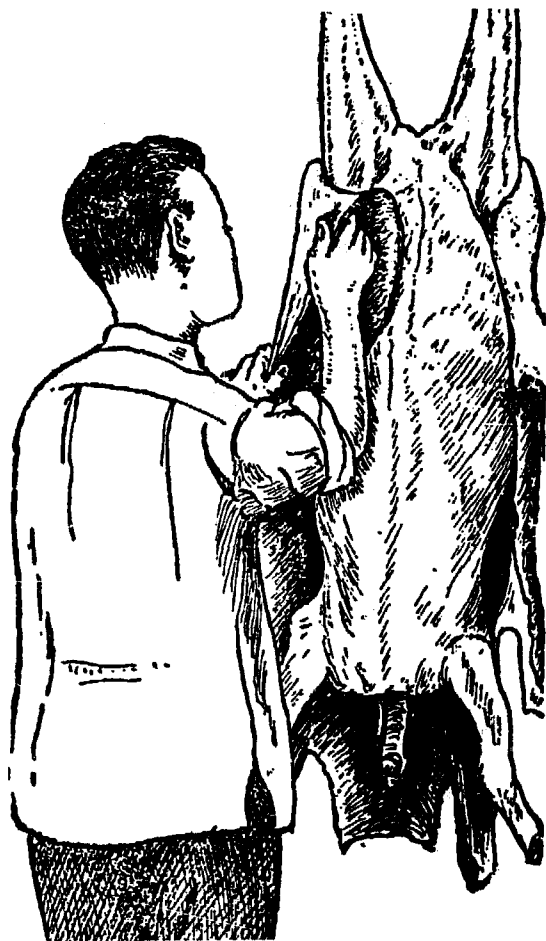


Fig. 80. Remove skin by pushing fist between hide and thin under-skin.

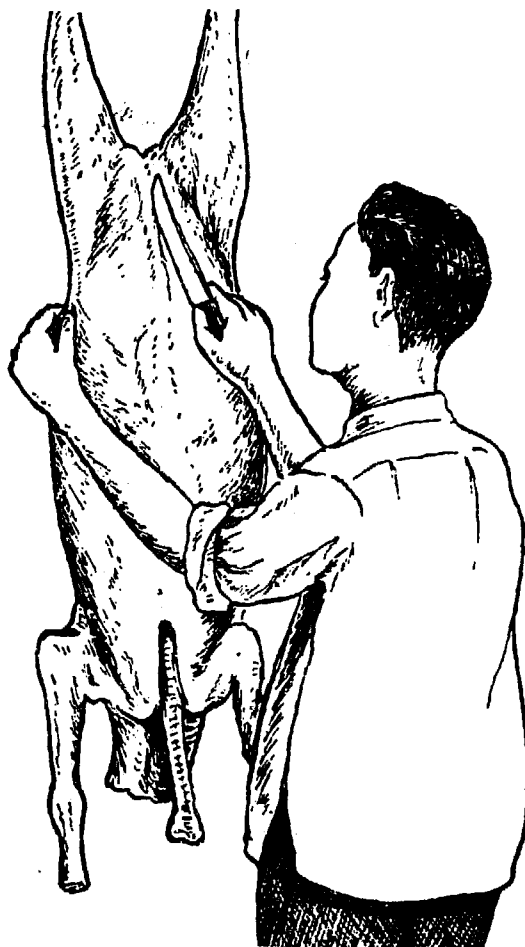


Fig. 81. Skinned goat. Cutting open belly for cleaning.

placing the entrails in a basin we wash out the inside, and loosen the blood vessels along the back by massaging inside the cavity. (Fig. 82).

Suggestions For Cooking Goat Meat

If the goat is properly slaughtered, cleaned, skinned, and butchered, the delicious flesh delights the palate of the lover of good food. In the next pages are given a few of the many ways of preparing goat meat for the table.

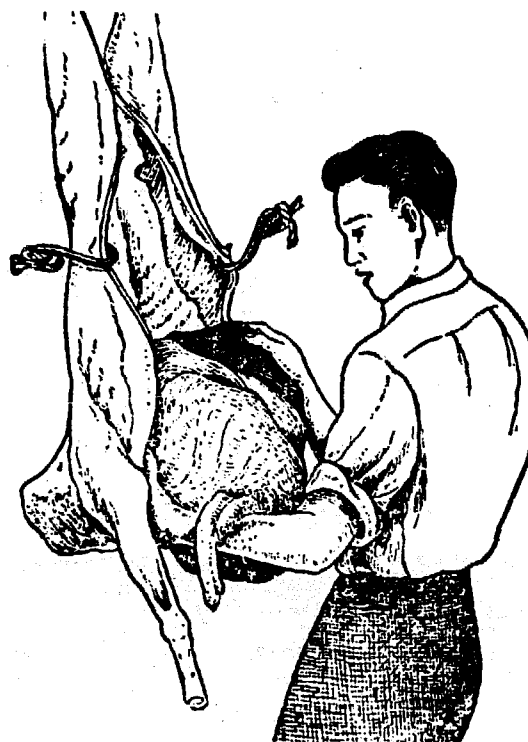


Fig. 82. Entrails fall into waiting hands of butcher.

Then place in the curry pot three cups of chopped cooked goat meat, and add enough salt.

We serve this goat curry by pouring it over our plate of boiled rice.

Many people like to serve other condiments with the curried goat. We add a tablespoon of one or more of the following condiments on top of our serving, and mix it together:

- Grated coconut
- Hardboiled eggs, chopped
- Sweet pickles
- Chutney
- Peanuts, chopped
- Crumbled tinapa or other dried fish
- Chopped onion greens.

Barbecued Goat (Paradise Farms Style)

Dig a hole or pit in dry, firm ground about 1 meter deep and 1 meter square. Place a layer of large river stones 15 to 20 centimeters deep in the bottom and inclined upwards on the sides as far as they will go without falling.

Place paper and tinder in the bottom and pile firewood on top until the hole is filled, and light the fire.

While the fire is burning, slaughter the goat, skin it carefully so the hair does not touch the flesh, and after bleeding and cleaning the carcass, cut it into large pieces.

Sprinkle or brush barbecue sauce or toyo on the pieces of meat and salt and pepper them. Wrap each large piece in banana leaves.

When the fire has burned down

to coals, and the stones are almost red hot, place an iron grill over the coals or cover the coals with dry sand, and then place the banana-wrapped meat on the coals.

Immediately cover the hole with iron sheets and shovel earth on top one foot high and extending a foot around the edges to keep the heat inside.

In 6 to 8 hours the meat will be tender, juicy, and piping hot, and can be left in the pit longer until we are ready to serve.

To have this barbecue for lunch at two o'clock, we should start at 4 o'clock in the morning.

T a p a

Goat meat tapa is made by cutting the meat very thin and soaking it overnight in the following mixture, for 1 kilo of goat meat:

- 1½ tablespoons vinegar
- 1½ tablespoons salt
- 1 tablespoon sugar
- 3 pieces chopped garlic
- 1½ tablespoons toyo
- Black pepper

The next day dry the meat on bamboo sticks under the sun.

Goat Meat Pilaff (Malayan Fried Rice)

- 1 cup raw rice
- 10 pieces of goat meat, match-box size
- 4 onions
- 1 piece garlic
- 1 cup of lard
- 1 bay leaf
- 3 chiles
- 1 teaspoon salt

Black pepper, kinchay, spices
Boil the goat meat in water un-

til it is tender, with 2 sliced onions, a little ginger and some salt.

Remove the meat and let the liquid boil until it is reduced to about two cups of liquid goat broth.

Meanwhile fry 2 onions, chopped garlic, bayleaf, chiles, salt, pepper, kinchay and spices in 4 tablespoons of lard until golden brown, and remove these from the pan.

Place the *uncooked* rice in the pan with the rest of the lard, let it cook until slightly brown stirring constantly.

Then add the condiments, the goat meat and the goat broth, and cook slowly until the rice is tender.

Let the excess moisture escape before serving.

Goat Feet

If we have goat meat for a fiesta, we may slaughter three or four goats. That will give us a lot of goat feet to make use of. The French people have the following excellent recipe:

- 12 goat feet
- 2 onions
- $\frac{1}{2}$ liter broth
- Cooking oil
- Flour
- Salt and pepper
- 6 kalamansi

Scald the goat feet in boiling water and remove every bit of hair, and clean and scrape the feet. Then place them in a cooking pot with boiling water, add salt and 6 chopped kalamansi (juice and skin). When cooked sufficiently

take out the big bones, and cut the feet into 2-inch pieces.

Chop two onions fine and fry until brown, then add a tablespoon of flour and continue cooking until the flour is brown. Now we add two cups of the broth in which the feet were cooked, and cook slowly for about 10 minutes, and then place the goat feet in the liquid and cook for 10 minutes more.

Serve with fried rice.

Goat Meat Siskabab

- Goat meat
- Salad oil
- Vinegar (or tinto)
- Green Bell Peppers
- Onions
- Garlic
- Salt
- Toyo sauce

Cut pieces of raw goat meat from leg about the size of a large egg. Soak overnight in oil and vinegar with pepper, salt and garlic. (If you have some tinto or red wine, that can be used instead of vinegar.)

Cut large bell peppers and onions lengthwise.

Place on a bamboo stick (tuhugan) a piece of the meat, then a slice of green pepper, next a piece of onion, then another piece of meat, all close together. Grill or barbecue this over a fire until cooked, and sprinkle with barbecue sauce or toyo. Always grease the stick first so the meat will slip off easily.

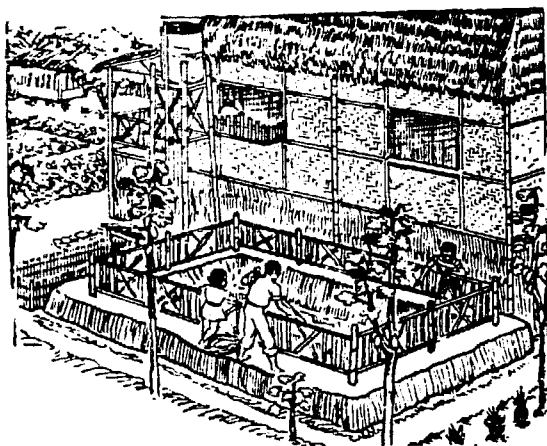


Fig. 84. If high floods reach our homes, fishpond may be built above ground.

into the ground and which evaporates under the sun. The fishpond should be in a sunny place.

Starting Operations

As soon as the fishpond is built we fill it with water about 1 meter deep. Then we throw into the water about 20 handfuls of powdered rock lime (apog), to disinfect the water, and 20 handfuls of superphosphate, or any animal manure from chickens, ducks, goats, pigeons, or pigs, to fertilize the pond. When these preparations are completed, we are ready to put in the small fish to seed our fishpond. Many farmers think it is better to plant the seed fish a week after the pool has been prepared.

For our small fishpond we can start with about 12 very small seed fish (fry) or about 6 fingerlings about 2 to 8 centimeters long. We can get the seed fish free from the Bureau of Fisheries at Manila, when they have a supply. Private fishpond owners also sell the seed fish.

Kinds Of Fish

There are several kinds of fish suited for a backyard fishpond. They are the *giant gourami*, *carp* (carpa), *bañgus* and *tilapia*. Many farmers now consider the tilapia the best.

The giant gourami and the carp take more than a year to mature. They grow to a size of 30 to 45 centimeters in length and weigh from 1 to 1.5 kilos.

The bañgus reaches a marketable size of 25 to 30 centimeters in six months and weighs from a half kilo to nearly a kilo.

The tilapia matures in from two to three months under favorable conditions, weighs about a third of a kilo and grows to a length of from 15 to 25 centimeters in one year. From fry stage it grows to sexual maturity and breeds under very favorable conditions within one month. Under unfavorable conditions sexual maturity and breeding may be delayed as long as six months. A pair of tilapia under favorable conditions can multiply to one and a half million fish in one year.

Farmers in many barrios are already raising tilapia in their home fishponds. They say it has a very good taste, something like apahap, and grows very fast. Thousands of barrio farmers in Indonesia, Thailand, and South Africa are growing tilapia very successfully, and adding to their family food supply. Even though this fish may be new to some of us, it is worth trying, because other barrio farmers have had such good results

Feeding The Fish

The food of the fish we plant in our home fishpond is mostly the *plankton* or algae. *Plankton* is a word we will learn and remember. Plankton is the name given to the very small floating green particles, which grow naturally in standing water and soon make the water green. These particles are living plants and animals, too small to see with our eyes, which multiply and grow in the water, and that is why we have to add fertilizer to our fishpond. These fish also eat the green substances that grow on the bottom and walls of the pond, the insect eggs and larvae, and snails.

Catching The Fish

Farmers living near the sea or river know many methods of catching fish. But those of us who

lack this experience will want to know the different methods of harvesting the fish from our back-yard fishponds. The methods described here are for the tilapia, which is a new kind of fish for many of us. But the same methods can be used for harvesting other kinds of fish.

Dip net.—Usually a dip net for catching tilapia is square. The size of the mesh varies with the size of the fish to be caught. For catching tilapia not smaller than the fingerling size, a mesh of 1 centimeter should be used. This net is lowered until it lies flat on the bottom of the pond. Then some feed, such as rice bran, is spread on the water surface just above the net. When plenty of fish are above the net, the net is lifted as fast as possible to prevent their escape. (Fig. 85).

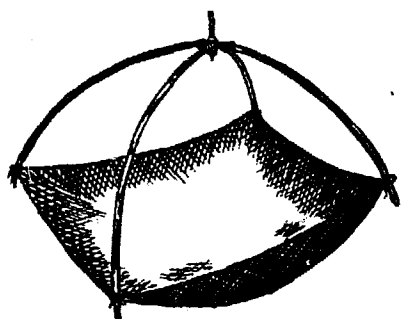


Fig. 85. Dip net.

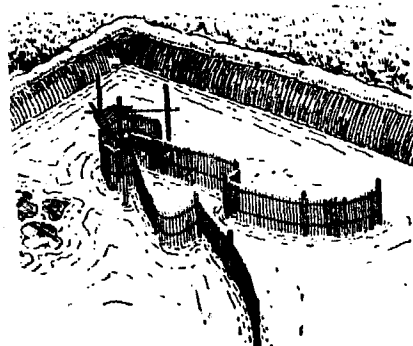


Fig. 87. Bamboo fish trap.

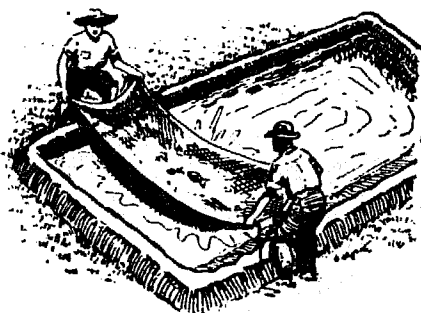


Fig. 86. Lift net.

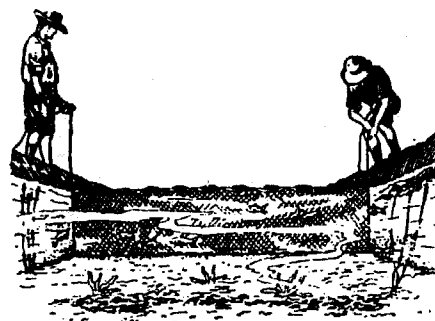


Fig. 88. Gill net.

Lift net.—This net is operated much like the dip net. The only difference is that it is much larger than the dip net and it requires two to four men to operate it. The size of the net varies with the width of the pond. The mesh size also varies with the size of the fish to be caught. For catching tilapia from fingerling to marketable size a mesh size of 1 centimeter is recommended. (Fig. 86).

Bamboo fish trap.—This fish weir is made out of bamboo splits tied together with coconut coir, "diliman" or other kinds of vines or strings.

Disturbances are then made on all other parts of the pond. The frightened fish swim around to look for shelter to hide. Many take refuge inside the heart of the trap. The fish are taken from this weir with the use of the scoop net. (Fig. 87).

Gill net (Pante).—The gill net is used to catch the fish through entanglement. It is operated by spreading the net across the center of the pond, allowing it to hang vertically on the floatline, like a curtain. As soon as this is set, the fish are frightened by beating the surface of the water with bamboo poles or pieces of wood. (Fig. 88).

Managing Our Fishpond

Every three weeks we should add a few handfuls of fertilizer, either superphosphate or animal manure, to our fishpond. That will make the fish grow faster and allow the pond to hold more fish, because it increases the supply of plankton in the water.

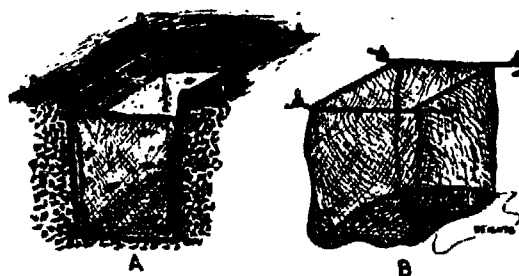


Fig. 89. We can start with a small breeding pond, before building the growing pond.

But even with plenty of food, there is not always enough in a small pond where the fish multiply very rapidly. As the young fish get larger we have to keep taking out the larger ones, to leave more room. The fewer the fish in the pond, the faster they will grow. When we have too many small fish, we should give some to our neighbors who want to start fishponds.

The tilapia multiplies so rapidly that many farmers build separate breeding ponds and growing ponds. The breeding pond does not have to be large. Some of us line it with a net, so we can lift the net and take out the excess fish from the breeding pond. (Fig. 89).

We transfer the larger males to the growing pond, where they will not multiply because they are all males. Thus they will not be crowded and can grow to large size, sometimes nearly 30 centimeters long. The excess females can be eaten as dilis or made into patis. Or, if we want, we can have another growing pond for only female tilapia.

The male tilapia is recognized because of its projecting sexual

organ under the tail. The female tilapia has a round swelling under the tail with a curved opening.

We must keep our eyes open to see that no *dalag* gets into our fishpond, because the *dalag* will eat the tilapia. The *dalag* often travels through the rice fields seeking a body of water like our pond. The *hito* and *martiniko* are also killers of the tilapia.

How Our Barrio Can Start Home Fishponds

To get fish raising started in our barrio we should get together and establish a community seed fishpond where we can raise small fish to distribute among ourselves. That way, we only have to get a few seed fish, and after that we can raise all we need in a few months for distribution to those of us who build our home fishponds.

Our Carabao

A Neglected Source of Abundant Milk

In 1964 there were about 4 million carabaos in the Philippines. That means an average of one carabao for every seven people. Our farm production depends upon strong and healthy carabaos. For a thousand years, therefore, we have usually taken very good care of these animals.

Carabaos not only pull our plows, our harrows, our carts, and our sleds. They are also an important source of food. When a carabao is too old, we slaughter it for meat. If we have a female carabao, we get milk and cheese as a part of our diet, in addition to having a producer of baby carabaos.

Many of us do not get as much milk from our carabaos as we should. So we have to go to the tienda and buy imported canned milk.

If we have a female carabao, we

will no longer have to buy canned milk at the tienda. Many farmers have found that if we feed and care for our carabao "cows" better, we can get two liters of fresh milk daily during the carabaos' milk-giving (lactation) period. That is more milk than two tall cans of evaporated milk every day. Also, carabao milk is richer than ordinary cow's milk, because it has more butterfat and other food values.

When we consider the price we pay for genuine evaporated milk—about 80 centavos a tall can—we should try to earn this ₱1.60 a day extra by using our carabao for greater milk production. We either save this much on our purchases at the tienda, or earn it by selling the carabao milk.

Lactation Period

Of course the carabao does not give milk every day of the year.

The milk-giving season may be as short as 130 days and sometimes as long as 310 days. The customary milking period is about 237 days or nearly eight months. We can make the lactation period last longer by giving the correct feed and care to the milk carabao, and milking her regularly.

Care of the Milk Carabao

We use our carabao for many purposes. The carabao is more important to the Filipino farmer than anything he owns. With a carabao he can rent land for growing crops, if he does not already own a field. He can hire his carabao to others who do not have a carabao. He can earn money from hauling crops by cart or sled, and he can earn from plowing and harrowing contracts.

The successful Filipino farmer knows these things, and we therefore already appreciate our carabao and treat it well. But we are only now beginning to learn how to care for the milk carabao so she will yield much more milk than we have been getting.

Feeding Our Carabao

The carabao is called a "roughage" feeder. That means it eats grasses, straw, stubble, corn stalks, vines, and other plants. This is obtained by growing plants especially for feeding to the carabao, or by giving the carabao the farm wastes that she enjoys.

If we have a carabao, we are probably raising rice, corn, or sug-

ar cane part of the year. Our rice straw is excellent feed for the carabao. Sugar cane tops are very much relished. But if we want to increase the milk yield we should also feed our carabao with grains or other concentrated feed, such as cracked corn, rice bran (darák), green tapilan, cowpeas (paayap), copra meal, molasses, or whatever else may be available and nourishing. If tropical kudzu is fed to our milk carabaos, it reduces the amount of grain and other concentrates needed. And we must not forget to use the corn cobs after we have shelled the corn. We have recently learned that corn cobs have almost 60% as much feeding value as shelled corn grains. Also we will feed to our carabao the ears of corn which are defective. Of course the corn cobs should be ground before feeding them to the carabao.

The carabao eats about 30 kilos of grasses and other roughage a day, but if she is giving milk or doing hard field work, she will eat more. And we must not forget to supplement this roughage with more concentrated feed, such as darák and ground corn.

Salt is another substance which our carabao needs. A small amount can be added to the mixture of concentrated feed.

Pregnancy and Weaning

The pregnancy period of a carabao is about 324 days—nearly 11 months. So during that period we will not be able to milk the animal.

To have enough milk for our family every day of the year, we really should have two female carabaos.

Five days after birth of the calf we can remove it from the mother and give it a share of the milk we get from milking the carabao.

Or, we can let the calf suck the mother's milk during the daytime or nighttime only, according to when we want the milk for our own use. In this case, as soon as the calf is able to subsist on roughage and concentrates, we should completely separate it from its mother.

Milking the Carabao

The carabao should be milked twice a day, in the early morning and at the end of the day. Before the calf is weaned, the hand milking can be done at one time, and the calf can suck the milk the other time. Here is our best milking procedure:

1. After the clean milk bucket is ready, we wash our hands with soap and water.

2. Next we wash the udder of the carabao with a clean cloth and water immediately before the milking is begun. Warm water is preferable.

3. The hands and the udder are dried and the milking begins.

4. When the milk flow becomes very slight, we nudge the udder to see whether the carabao has released all the milk. Sometimes a nudge will release more milk into the teats.

5. The final drops of milk should be "stripped" or squeezed out. To do this we take the teat (utóng) between the thumb and first finger, and press firmly as we run the fingers down the length of the teat.

Many of us neglect this "stripping," so some milk is left in the udder and teats. We now know that if we empty the udder and teats completely, the production of milk increases, and if supplementary feed is given the milk carabao, the milk-giving period may be somewhat prolonged.

Improving Our Milk Carabaos

The Philippine carabao does not yield as much milk as some breeds of foreign carabao. The Indian carabao called the Murrah gives an average yield of $3\frac{1}{2}$ liters daily, compared with 2 liters average for the Philippine carabao.

The government began importing Murrah carabaos in 1917. They have multiplied since then. If we can find a Murrah bull in our province, we should have our Philippine carabao mated to the Murrah bull. The female offspring will inherit some of the ability of the Murrah carabao to produce more milk than the native carabao. This is called "upgrading." When an upgraded female is ready to breed, we can mate her with a Murrah bull, and the female calf resulting from this second upgrading will be a better milk producer than her mother.

Home Food Preserving Made Easy

For many years the domestic science classes in the schools have been teaching how to preserve fruits, vegetables and meats, so that in the seasons of plenty we can save food for the seasons of scarcity.

We barrio people have not been able to practice food canning because we lack the best equipment. Unless very good methods are followed, the food we put in the jars may get rotten and make us sick.

Another difficulty has been the high cost of imported glass preserving jars, about ₱1.20 each. Of course we can use these jars, again and again. But if we want to preserve, for example, 25 jars of tomatoes, 25 jars of fruit preserves, and 25 jars of pork sausage, we would have to invest about ₱100 only for the jars!

Now here is the good news for the SAMAKA housewife. The San Miguel Brewery Glass Factory is now making home preserving jars in Manila, at a price we can afford to pay. So it will now be possible for us to preserve much of our season's harvest for future use.

Maybe one of the SAMAKA housewives is somewhat expert in food preserving. In this case, it would be a good plan for us to appoint her Assistant Leader For Food Preserving.

Our Assistant Leader in Charge of Food Preserving will be furnished all the instructions by the Agricultural Extension Worker and if we adopt this SAMAKA way, a domestic science expert will be sent to give our group personal instructions.

We can also get a free recipe booklet on food preserving by writing to San Miguel Brewery Glass Factory at Manila.

If we plan to preserve meat, fish, or non-acid fruits and vegetables (such as beans, corn, eggplant, and okra), we need a large 20-liter pressure cooker. This costs in the United States about \$30.00, but here the price is much higher. Every family cannot afford one. But if a group wants to preserve these kinds of foods, they can group together and each contribute something to buying a community pressure cooker. (See Figure 90.)

Probably most of us will preserve our fruits and vegetables as pickles, or will preserve the fruits and acid vegetables that do not need a pressure cooker, such as tomatoes, mangoes, pineapples, bignay, guava, santol, oranges, and kalamansi. Then we simply prepare the fruits, place them in jars, then fill the jars with hot juices or syrup, and heat the jars in a tub of boiling water. After the water has been

boiling for the time stated in the recipe, we seal the jars and put them on our shelves.

One of the most useful vegeta-

bles for us to preserve is the tomato, because we use the tomato to flavor so many of our foods. We have no tomatoes in our garden during many months of the year. But we have a surplus during other months.

Will it be profitable for us to preserve tomatoes? Suppose we want to preserve 25 jars of tomatoes in the Size No. 24 jars that hold $1\frac{1}{2}$ pints (about $\frac{3}{4}$ liters). At the 1963 prices, here is what it will cost us:

25 jars tops - - - - - ₱1.35

25 pint (16 oz.) jars,
₱5.50, divided by 5
years useful life - - - 1.10

Fuel for cooking - - - - - .50

Spices - - - - - .10

Total, not counting value
of tomatoes - - - - - ₱3.05

To buy these 25 jars of tomatoes in cans at the store would cost us not less than ₱50.00.

What will our Leader in Charge of Food Preserving gain by helping us with this work? Many of us will be calling on her for her time and labor, so she will neglect her own household duties while helping us. Therefore, we should give her a share of the preserved foods, say 2 jars out of each 12. Since the preserving is done under her direction, she will know that it is of good quality. Suppose there are 50 SAMAKA families in our group and each of these families preserves 72 jars a year, the Leader would receive altogether as

Glass Jars Made in the Philippines		
	Sizes	
	Fluid Oz.	Cu. Cm.
	4	118.28
	6	177.42
	8	236.56
	12	354.84
	16	473.12
	24	709.28
		
Metal Covers		



Fig. 90. Community pressure cooker best for safe food preserving.

her share, from the 50 families she helped, a total of 600 jars of canned food. That is enough quan-

tity for her to sell, and will pay her for her valuable help and hard work.

Carrying The SAMAKA Plan To Our Fields

After we have followed the SAMAKA plan for a year we will probably decide that some of the things we have learned in our home garden will bring us rich rewards in our rice field, or corn field, or tobacco field.

If we grow only one crop, we will ask ourselves, "Why not plant something in our farm fields after we have harvested our rice?"

Legumes Enrich Our Soil

We learn in our SAMAKA garden that when we plant beans, or mungo, or some other crop of legumes in our garden, the land becomes richer and produces more the next time. It is well known that if we plant mungo, or pea-

nuts, or patani in our rice fields after the harvest, we will get more rice the next year. In addition, we can harvest the beans and get extra income. Mungo, for instance, produces 15 cavanese a hectare, if we do it right.

Save Our Grass, Straw And Leaves

We also learn in our home garden that the rotted leaves and grass in our compost pile are good fertilizer. So we leave the mungo plants in the field to rot and plow this rich fertilizer back into our soil. Many farmers are finding that it is very profitable to build large compost piles right in the fields, where the surplus straw, leaves, and vegetable wastes are

systematically gathered and made into rich fertilizer for their field crops.

We have often seen some farmers burn their rice straw in the field. That is burning up the richness of the soil. It is the same as burning up a cavan of palay, because we are making our land weaker. In China the farmers buy rice straw when they can get it, and the price they pay is one-tenth of the price they get for an equal weight of palay! But as SAMAKA farmers we have learned the lesson in our garden of using all the vegetable wastes to enrich our soil.

Increasing Our Pig Production

Maybe we become very successful in our home garden in raising 2 or 3 pigs. We may decide to breed pigs and raise more, so we can sell them.

Then we must plant pig feed in our fields. Nobody can make money raising pigs if he has to buy a lot of feed for them. But if we plant camotes, or corn, or mungo in our fields after the rice harvest, that will give us enough food for many pigs.

Corn, Beans And Squash Together

A good way to plant for our pigs is to plant corn, then in the same row as the corn we plant sitao or other climbing beans and then in between the rows of corn we plant camotes or squash.

Corn was first grown by the American Indians thousands of years ago, and the farmers of those days, barrio farmers like us, followed that way of planting se-

veral things together.

The reason this method is successful is now understood. The beans climb on the cornstalks so we do not have to place stakes for them. At the same time the roots of the beans bring fertility to the soil. The leaves of the camote or squash shade the ground and keep it from getting dry and stop the weeds from growing, so we do not have to cultivate.

We harvest the corn, the beans and the squash when they are ripe, and sell them or keep them to feed our hogs and chickens. After we have harvested these things we let the pigs and goats pasture there, being careful not to let them roam. What they *do not* eat we plow back into the ground to make it more fertile. What they *do* eat will be converted by the bodies of the animals into rich manure in 24 hours.

This system of planting several crops at one time which help each other and also help the soil is called the lazy man's system. But we do not think so. We call it the way to get the best reward for our labor. After doing this way for two years we will find that our rice field will give us 5 to 10 cavanese more a year.

Planting Without Plowing In Our Rice Fields

In Muñoz, Nueva Ecija, and in other towns around there, the farmers follow a very easy and profitable method of planting vegetables in their rice fields immediately after harvesting the palay. Their method does not require any plowing or further cultivating.

They apply to their fields what we have learned in our home garden.

This method is most successful where the soil is sandy loam, like the "tumanal" areas, with irrigation.

Immediately after the rice is harvested, the straw or stubble is cut close to the ground and piled to one side, to allow the excess water in the soil to dry for a week or two. When the field is sufficiently dry, the straw is placed evenly over the surface, making a mulch at least 5 centimeters thick. Then the field is irrigated enough to soften the surface, and the next day the vegetables can be planted, either with seeds or seedlings, according to the kind of vegetable, and without plowing.

The farmers in Nueva Ecija have used this method successfully for growing onions, garlic, beans, cabbage, pechay, mustard, tomato, eggplant, and ampalaya.

Our Rights As Tenants

If we are tenant farmers growing rice, we do not have the right to use the field we cultivate with-

out sharing with the landlord. We are entitled by law to have a homesite of at least 1,000 sq. m., although many landowners allow more than this.

Before we produce extra crops on our rice field outside of our homesite, we should have an understanding with the landlord.

If we agree to plant legumes, such as sitao, beans, cowpeas, patani, mungo, peanuts, etc., which add to the fertility of the soil, a wise landlord should agree to letting us use the land free, because it will increase the yield of the principal crop the next year.

Also, if we promise to graze plenty of livestock on the field, which will make the land produce more, a wise landlord may be glad to allow us to plant extra crops.

If the landlord does not agree to this, and we pay all the expenses, we may grow additional crops and we have to pay him only 20% (one-fifth) of our produce. In that case we would keep our livestock in our own homesite, and bring the hog food from the field, so as to have the manure for our own garden.

Our Barrio Fiesta

Many people criticize the barrio fiesta. They say it forces poor people to spend more than they can afford and go into debt. They consume all at once the food they should save for future weeks. After the fiesta is over many families do not have enough to eat for a long time afterwards. Therefore,

some people say, the barrio fiesta should be abolished.

We do not agree with these critics. We believe the barrio fiesta is a very necessary part of rural life. It should not be abolished. It should be made bigger and better.

We SAMAKA farmers can have

a better barrio fiesta than we ever had before, and at the same time we need not go into debt or consume food that we will need later on.

Some of the ways to have a successful fiesta without hardship are given here. These things we have learned by watching how the people in some barrios provide the food for the barrio fiesta.

The secret of success is to prepare in advance. As soon as we have recovered from the celebration of this year's fiesta, we must start preparing for the fiesta next year.

The most important item is meat. Usually it is pork, but sometimes there is also beef, or goat meat, and plenty of chickens. Usually the hardworking farmer who has saved more livestock than his neighbors is forced to contribute more than his lazy friends. For his own personal guests he sacrifices a young pig for a lechonada that he should keep until it grows big.

In some barrios the burden is made easier by having a community banquet instead of having special food at every home. In a SAMAKA barrio, where people work well together, the community banquet seems a good idea.

If this plan is followed, we decide a year in advance how many people are expected, and how much meat will be needed to feed them. Then let us decide among ourselves who will be assigned to raise the pigs for the fiesta.

Let us suppose that we have 100 families in our SAMAKA group.

That is about 500 mouths to feed. If each family is allowed to invite 5 visitors to the banquet, that makes altogether 1,000 people. We will need for so many people 300 kilos of meat. That requires 6 large hogs.

During the year each one of us will have to contribute a little feed to the 6 hogs being raised for the fiesta, and this way they become community hogs.

Lechon

It is wasteful to use small pigs. But every one craves the taste of crisp skin of the small roasted pig. How can we satisfy this taste?

The best way to use large fully grown pigs and get the lechon taste, is to make the well known "Lechong Macao." This means we steam or boil the meat a short time before putting it over the open fire.

The other foods are not so difficult for the SAMAKA farmer, because all of us will have plenty of fresh fruits and vegetables in our garden. We give some for the community banquet and keep some for our house guests.

If our SAMAKA barrio does not have a community banquet, then each of us who will entertain visitors should raise one extra pig just for the fiesta, or have a few extra chickens and ducks for our personal visitors.

The important thing is for us to prepare the special things we will need in advance, so we will not be forced to consume our regular daily food all at one time for the fiesta, and then go hungry.

This is the prudent SAMAKA way.

Decorations

If we have followed the suggestions in the other part of this book about growing a few flowers, we do not have to spend for decorat-

ing the house and streets with paper streamers. Instead we will have plenty of all kinds of flowers to string across the streets, much more beautiful and typical than the artificial decorations. We will also have plenty of garlands of flowers for the procession.

SAMAKA Farmer's Children

When a barrio farmer adopts the SAMAKA way of life, he adopts it for the whole family. All the children are given their special tasks in taking care of the garden and the chickens and the pigs. This not only distributes the work better. It teaches the children the work for the good things of life, grown up. If they go to school, They learn by doing how to become better farmers when they are important lesson, that we have to the work they do in the home garden may be allowed to take the place of work in the school garden.

Some of the children will become enthusiastic and eager to do some particular work better than other children in the barrio. Then they should be encouraged to join the local 4-H Club.

What Are The 4-H Clubs?

The 4-H clubs are organizations of boys and girls who want to learn by actual practice the better methods of farming and home making as well as the how and why of doing things. Membership is open to young people between the ages of 10 and 21. Every club member is required to carry out

one 4-H project each year. A project may be almost anything—from raising a pig for market to designing a dress, from growing a vegetable garden to landscaping a front yard, from cooking rice to preparing a complete meal. They learn by doing not only how to be better farmers and homemakers, but also how to be better citizens.

Who Sponsors 4-H Clubs?

The 4-H clubs are sponsored by the Bureau of Agricultural Extension of the Department of Agriculture and Natural Resources. They draw a great deal of support from business and civic groups. These groups act as the 4-H club advisory council which sponsors prizes and awards for contests. The 4-H club also depends upon the support and cooperation of school teachers and officials, and others who are interested in encouraging all worthwhile activities among the groups they are working with.

The club members are under the supervision of the agricultural and home demonstration agents who represent the extension bureau in the provinces.

Hints On Food Needs

The human body needs four basic kinds of food, as everyone knows. We need energy food called carbohydrates, such as rice, corn, potatoes, sugar, and fats. We need muscle and tissue building foods, called proteins, such as fish and meat. We need minerals for building bones, teeth, and good red blood. And finally we need vitamins to keep us healthy and promote growth.

Each one of these basic foods contains some of the things we find in the others, but generally not enough. Therefore, when we can afford it we always try to have each day our rice, corn, or bread, with a viand of fish, chicken, or meat, and some vegetable or gulyay.

For the energy foods there is no true substitute for the rice, corn, potatoes, camotes, rimas, gabi, cassava, banana, and the other foods that have plenty of starch.

For repairing and building our muscles and other parts of the body, we need plenty of fish and meat. But if necessary we can do without fish and meat, and take in their place beans, such as mungo, peanut, cowpeas, and soybean, because they have plenty of the same substance we find in meat (protein). But if we do not eat either fish and animal flesh or these beans our bodies will be weak.

Every day we should eat the fresh fruits and vegetables which

have so many minerals and vitamins that our bodies need. They contain the substances which promote growth and keep us healthy and prevent such common diseases as scurvy, pellagra, and beriberi.

Some foods are especially important, because they have substances which certain parts of the body need. We know that children do not have strong bones and do not grow tall, unless they eat the foods that have the right kinds of minerals. Eggs and milk are especially important for children and for pregnant and nursing mothers. When a grown man breaks his arm, the doctor tells him to drink plenty of milk to make his broken bones heal.

The balut is also very good for making strong bones and teeth.

One food that is very common in the Philippines is the banana, which is rich in all of the food substances. If we have nothing else to eat, plenty of bananas can keep us strong and healthy for many months.

To be sure that we get all of the substances our body needs, it is good for us to eat many different kinds of food, instead of eating the same thing every day. If today we have pork, kangkong and banana, tomorrow we may have tulya, malungay, and ripe papaya. In this way, the things lacking in today's food will be found in to-

morrow's meal. Every barrio farmer has observed that his neighbors who eat many kinds of food usually resist disease and have strong

healthy children. With our SAMAKA home garden and livestock, all of us can be stronger and healthier than before.

Home Industries

It Is Easier For SAMAKA Farmers To Borrow Money

When a barrio farmer follows the SAMAKA way of life he gets better food and becomes a stronger worker. Also everyone admires him because he is helping himself in an intelligent way. The extra food he produces in his home garden is the same as increasing his income. If he needs to borrow money for his farming activities people will trust him more than they trust farmers who do not follow the SAMAKA method. The Philippine National Bank has sent the following instructions to all of its branches and agencies:

"It will xxx be a general policy of this Bank to give special favorable consideration to applicants for agricultural loans who practice supplementary subsistence farming to an extent commensurate with their potentialities.

"Therefore, when an application for an agricultural loan is received, especially from a working farmer, the inspector or other person inspecting the applicant's farm will report whether the applicant has a successful home garden to increase his food supply and make better use of his time and idle land. Diversified farming, including home gardens, poultry,

and livestock, is a sign that the farmer is progressive and will be more able to repay his obligation. A good system of diversified subsistence farming will be considered a factor in the consideration of a loan application, supplementing other factors prescribed by existing regulations."

Home Industries For SAMAKA Farmers

The SAMAKA Guide is intended to help the barrio farmers to produce more and better food for their families. After our home garden is more productive, with plenty of fruits, vegetables, and meats, we will find all the members of our family filled with energy. Between the harvests of our regular crops, taking care of our home garden and livestock will not keep us very busy. So why not use this spare time between crops in making things for sale, so as to have more money in our pocket?

That is what many barrio farmers are already doing. Others have not started home industries because they do not know what to make that people will buy.

Maybe our town already has some home industry which only a few people are following, because there is no steady market. Then

let us see how we can find a better market.

If we want to start home industries in our barrio, or expand the industries we have already, our SAMAKA leader can get information and a teacher to tell us about

this way to make more money. Among the many home products which we might want to make, the following are suggested:

Pottery	Baskets
Weaving	Mats
Hats	Artificial flowers

Our Family's Health

It is the ambition of everyone to have a strong healthy body. If the SAMAKA farmer and his children have a home garden, with fruits, vegetables and livestock, they will be better able to resist disease because they eat the good kinds of foods. But that is not the only key to good health. We must also arrange the conditions of our house and keep its surroundings clean and sanitary so that the germs which bring sickness cannot enter.

The germs of disease that most people in the barrio should fear are invisible to the eye. But most of us know how these germs secretly enter our bodies. Many of the germs use mosquitoes, flies and cockroaches as their agents. Our task is to keep these agents away, and in that way we keep away the invisible germs. Other germs pass through the air or from touching.

Here are a few of the things that we SAMAKA farmers can do to keep our families free from the germs that bring sickness:

Malaria.—When some person in our town has malaria, it means the germs of malaria are in the blood

of that person. If a mosquito sucks that person's blood, the germs of malaria then enter the body of the mosquito, and when that mosquito bites other people, it can give the germs of malaria to the other people. If we always sleep under a mosquito net, perhaps the mosquito cannot bite us. But it is even more important that people who already have malaria sleep under a mosquito net. If many people in our barrio have malaria, we should call on the sanitary inspector to destroy the places where the mosquitoes grow.

Dysentery, cholera, and typhoid.

—The germs which cause these diseases enter the body through the mouth. When someone with these sicknesses discharges his bowels, the germs are carried in the wastes. Then, if a fly alights on the wastes it will carry some of the wastes and the germs to our food. When we eat that food, the germs enter our mouth and we get the sickness. Another way, is when a person having this kind of sickness does not wash his hands after discharging his bowels. If he touches the food or dishes, he leaves invisible specks

of the wastes and the germs on that food. Then, when we eat that food we may let the germs into our body and we get that sickness.

If anyone gets sick from dysentery, cholera, or typhoid, it is because he has taken some human feces into his mouth! Even if it is so small we cannot see it, it is enough to make us sick.

Here are the chief rules we should follow to keep the germs of dysentery, cholera, and typhoid from entering our bodies:

1. Build a simple sanitary toilet, either the bored-hole latrine or antipolo type, so that no flies can ever touch human feces at our house. Plans and directions for building a cheap and good toilet

with local material is shown on the opposite page.

2. Teach everyone to wash his hands with soap and water after using the toilet.

3. Wash all fresh food carefully before eating it, and keep it covered so flies will not alight on it.

4. Keep our water jar covered, and do not dip into the water a cup that flies may have touched.

5. Drink water only from an artesian well, or water which we have boiled for 10 minutes.

If every SAMAKA farmer in our barrio carries out these simple precautions, pretty soon nobody will be attacked in our barrio by the germs of dysentery, cholera and typhoid.

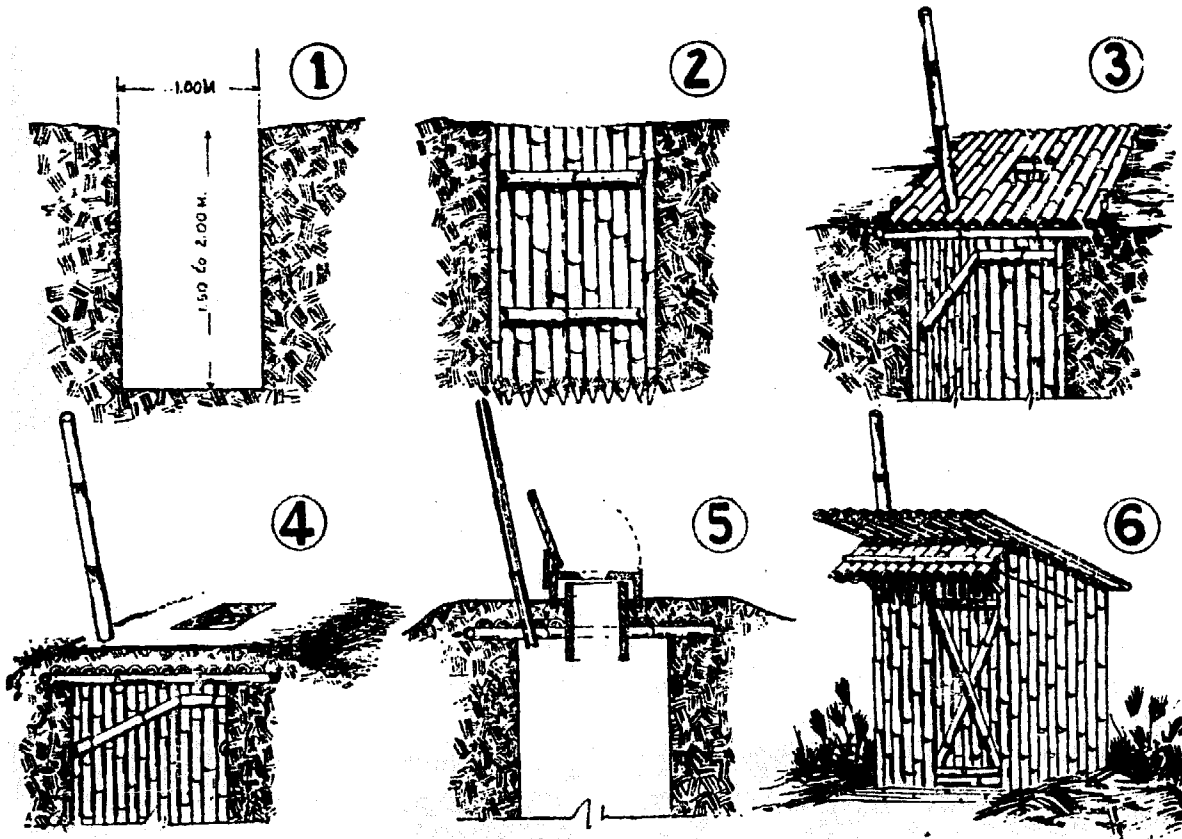


Fig. 91. A sanitary water closet for every barrio home can be built with local materials. 1. Dig a hole or pit in the yard, 1 meter square, $1\frac{1}{2}$ to 2 meters deep. 2. Support the earth walls with bamboos. 3. Cover the opening with half bamboos to support the floor, inserting a bamboo pipe for ventilation. 4. Make a dirt floor on top of bamboos, with soil from termite (anay) hills, mixed with sand; or with clay-loam earth. 5. Build a wooden box around opening with a seat above. 6. Walls and roof can be made of bamboo or sawale.

Tuberculosis

Tuberculosis is the disease which kills more people in the barrios than any other sickness. In almost every case of tuberculosis, we now understand that the person who gets tuberculosis has not been eating the right amount of food or the right kind of food. That is why we see so much tuberculosis among the poor people.

If the barrio farmers earnestly follow the SAMAKA plan, they can make tuberculosis disappear from their barrio. With our home garden, our home poultry, and our livestock we will all have *more* food, and we will all have *many different kinds* of food necessary to keep our bodies healthy. When our bodies are well fed, the tuberculosis germ is usually defeated. Of course, we sometimes see rich people getting tuberculosis. That is because some rich people do not always eat the right kinds of food, or because they work too hard or get some other sickness that weakens their bodies.

But even when we have strong healthy bodies that can resist the germs of tuberculosis most of the time, if the germs of the disease are too many they may win. For that reason, if someone in our house gets sick from tuberculosis, we try to keep the germs from entering our own body when we are tired, sleeping or weak.

That is why we must always have the person in our family who suffers from tuberculosis sleep in a different room from the healthy people. The germs of tuberculosis travel on the breath of

the sick person and try to enter the lungs of other sleeping people who breathe the same air. But if we breathe too much of the sick person's air, or he coughs in our face, the germs will be so many that even strong people cannot resist.

The germs of tuberculosis are also found in the mouth of sick persons. Therefore we get tuberculosis from kissing a sick person, or using the drinking glass or utensils used by the person who is sick from tuberculosis.

As SAMAKA farmers we should all be proud that by following the SAMAKA way of life, we can do more to drive tuberculosis from our country than can all the doctors and the government health officers.

Skin Diseases

Skin diseases, such as ringworm, yaws, and scabies, are also caused by invisible germs. All of us know that if we touch someone with skin diseases, we are likely to transfer the germs to our own skin. Many of us forget that the same thing happens if we touch some object which the sick person has touched. While the person with a skin disease is being treated, it is important that no one else touches his clothes, his blanket, or the chair he sits on. The clothes of the sick one should be frequently boiled to kill the germs on them, and the person who touches anything which the sick one has touched should quickly wash his hands with plenty of soap and water.

Keep Our Grounds Clean

The SAMAKA farmer should keep his ground well drained so standing water will not support mosquitoes. Empty cans and coconut shells scattered around the yard are also bad. The garbage and refuse from our kitchen we either feed to the pigs and chickens or place in the compost pile. The manure is used for fertilizer in our garden. Flies may breed in the manure when the compost pile is not properly made. If we have been careful to keep the flies from our food, they will not harm us. If they become too many, then it is better to cover the compost pile with a layer of garden soil. Also we can ask the sanitary inspector to spray the place with DDT if

flies become too many in our barrio. We cannot abolish flies from a farm, but we can reduce the number and keep them from bringing the germs of sickness to our food.

Disposal Of Garbage

The garbage and kitchen wastes that we cannot feed to our pigs or use in our compost pit should be buried deep in the ground or burned.

This is especially necessary for the entrails, feathers, and hairs of the chickens and livestock we kill. We should also bury near the fruit trees all animals that die of sickness, and dead cats and dogs we find near our home.

Seeds

If we want good harvest from our SAMAKA garden we must plant good seeds.

By good seeds we mean that most of the seeds we plant will germinate or sprout; that the plants will show strength and vigor as soon as they germinate; and that the harvest from each seed planted will be plentiful.

How do we get seeds that have these three necessary qualities of *high rate of germination, maximum vigor, and generous yield?*

We get them by buying them

from the most reputable *producers of seed*, or in some cases by selecting seeds from our own plants with the same care that the most reputable seed producers use.

A good seed producer starts with good *parents* or *seed plants*. Plants are like people: the seed inherits the physical qualities of the parent plant. If we plant the seed of weakly sick parents, we will probably get a crop of weakly sick plants. If we select the poorest instead of the best seed from even a strong plant, we will probably get low yielding crop plants.

After selecting the *best seed* from the *best plants*, the expert seed producer next *cleans the seed*, to remove dirt, disease, and weeds. He next *dries* the seed to the exact percentage of moisture which he knows will allow the seed to be stored for a long time without losing its ability to sprout when planted (viability). The seed of each kind of plant has a different percentage of moisture to keep it alive—some 8%, some 10%, some 13%, and so forth. Testing equipment is needed to see when the seed is dried just right.

After drying the seeds, they are treated with *fungicides* and *insecticides*, medicines that keep fungus and insects from eating the seeds and from carrying diseases and pests to the garden.

Finally, the seeds are stored in sealed containers, so that the moisture inside will not change before planting time.

It is much better for us to buy our vegetable seeds from an expert seed producer than to gather seeds from our own garden. A packet of vegetable seeds can be bought for 60 centavos, and since bought seeds usually double our harvest it is a cheap price to pay for big yields.

Many seed dealers now sell vegetable seeds in the various towns of the Philippines or we can order them by mail.

Among the brands of seeds we have found best are Asgrow, Farmseed, Burpee, and Ferry-Morse.

SAMAKA SERVICE CENTER, INC.

1973

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What Is The SAMAKA Service Center, Inc.?

The Samaka Service Center is a non-stock, non-profit corporation organized primarily to help the Filipino family enjoy more abundant and nutritious food. Its name is derived from the first syllables of the words expressing its purpose in the Pilipino language: "Samahan ng Masaganang Kakanin," which in English means a group united to have more plentiful food.

The quickest way to get more food for the family, without an increase in ordinary income from wages or crops, is to produce it in our own backyards. Especially is this true in the rural areas, where most homes have 600 to 1,000 square meters for their homesite. If we will use this idle land wisely for food production—fruits, vegetables, pigs, poultry—using the part-time labor of all our family, we can produce easily ₱700 worth of additional food a year at each homesite. There are some 2 million farms in the Philippines. If every farmer added ₱700 a year to his food production, the nation would be adding more than ₱1.4 BILLION to its production! **THIS IS MORE THAN THE VALUE OF OUR ANNUAL SUGAR, COPRA, AND TOBACCO PRODUCTION!** The home garden is therefore the greatest underdeveloped industry of the Philippines.

For 60 years the Bureau of Public Schools has been promoting the backyard farm. Under its successful School and Home Garden program, tens of thousands of families planted home gardens and raised poultry, pigs, and other livestock.

In 1953 the Philippine Rural Reconstruction Movement (PRRM) made the home garden a main target of its barrio uplift program. The PRRM was handicapped by the lack of a home gardening manual. With the generous sponsorship of Colonel Andres Soriano, San Miguel Brewery defrayed the cost of publishing 10,000 copies of a manual on home gardening, entitled "The SAMAKA Guide to Supplementary Subsistence Farming." Another 10,000 copies were published in Tagalog under the title "Ang Gabay Ng SAMAKA." The public demand was so great that San Miguel Brewery supplied 30,000 more, so that every elementary school in the Philippines could get a copy. The supply of "The SAMAKA Guide" is now all distributed and is out of stock.

In 1956, to help the rural people increase their milk and meat supply, the Samaka Service Center published its second circular, "Let Us Raise Goats on Our Homesite Farm." Through the generosity of International Harvester Co., 25,000 copies were printed and distributed. Later, a Tagalog translation was published in the DANR magazine, "Ang Magsasakang Pilipino," (Volume II, No. 12).

In January of 1958, the then Secretary of Education, Honorable Manuel Lim, announced a National Self-Sufficiency and Food Production campaign under the auspices of the public and private schools. When he discovered that no comprehensive manual on rice growing in the Philippines had ever been published, he called on Samaka Service Center for help. This organization mobilized its resources and prepared a 100-page manual entitled "The Masagana Rice Farmer," and printed 35,000 copies. Altogether 31,500 copies were donated to public and private schools and the rest were offered to the public at ₱1 per copy. Most bookstores carry it in stock.

"The Masagana Rice Farmer" has become the rice-growing bible among rural leaders and English-speaking farmers. The cost was contributed by supporters of the Samaka Service Center.

"The Family Chicken Cage" is the fourth publication of the Center.

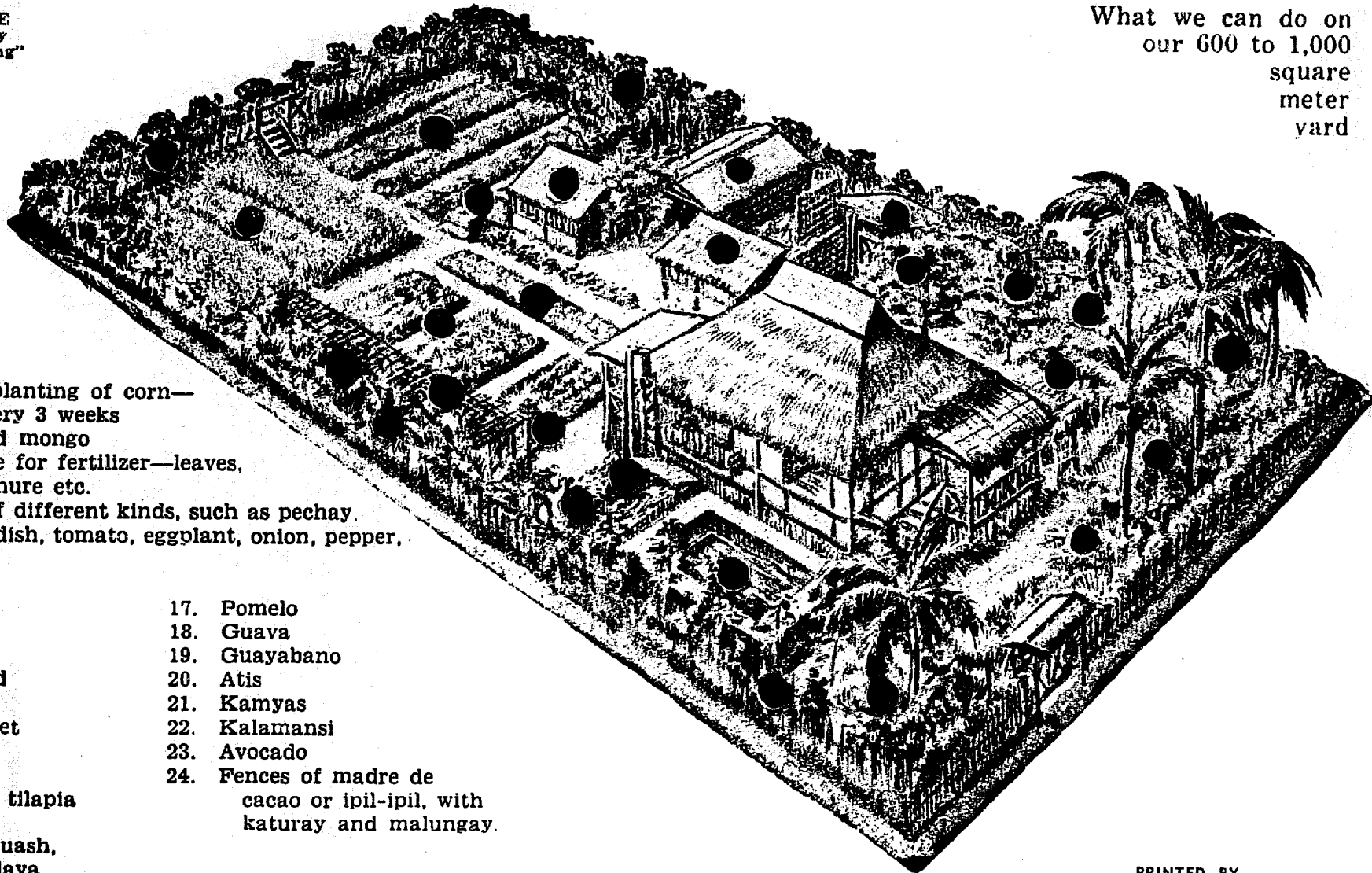
The author of all four publications is Mr. Colin M. Hoskins, an American old-timer who since 1909 has been closely identified with Philippine farming. He is a member of the Agricultural Council of the College of Agriculture, University of the Philippines.

The Samaka Service Center does not engage in rural field work. It was organized to help existing rural groups carry out their work among the people. The public and private schools, PRRM, PACD, NARRA, YMCA, Bureau of Agricultural Extension, and 4-H Clubs are the principal recipients of Samaka publications.

MODEL OF SAMAKA HOMESITE FARM

From "The
SAMAKA GUIDE
to Supplementary
Subsistence Farming"

What we can do on
our 600 to 1,000
square
meter
yard



1. Succession planting of corn—
4 rows every 3 weeks
2. Camotes and mungo
3. Compost pile for fertilizer—leaves,
straw, manure etc.
4. Vegetables of different kinds, such as pechay,
lettuce, radish, tomato, eggplant, onion, pepper,
garlic, etc.
5. Coffee
6. Bananas
7. Pigeons
8. Pigshed
9. Carabao shed
10. Chickens
11. Sanitary toilet
12. Garden well
13. Ducks
14. Fishpond for tilapia
15. Papayas
16. Trellis for squash,
uppo, ampalaya
17. Pomelo
18. Guava
19. Guayabano
20. Atis
21. Kanyas
22. Kalamansi
23. Avocado
24. Fences of madre de
cacao or ipil-ipil, with
katuray and malungay.

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Let us Raise Mushrooms

Mushrooms are easy to grow. They can be grown the whole year. All that is needed are the following: a modest capital, a small piece of land, enough water, a little sweat and lots of love.

This fleshy fungus thrives best on rice straw, corn stalks, dried banana leaves or stalks, water lily and other leguminous wastes. The best time to grow mushrooms is during the summer months when natural growing mushrooms are not in season. Fourteen to twenty days after planting, mushrooms can be harvested.

Materials needed for a mushroom bed measuring 5 meters long by 1 meter high:

1. Three 6-oz. bottles of spawn.
2. 150 bundles of 6" dia. x 2 ft. rice straw, banana leaves, corn stalk. The selected plant refuse must be thoroughly dried.
3. Enough water.
4. Old newspaper sheets.

The seeding materials or spawn can be obtained from the U.P. College of Agriculture in Los Baños at ₱2 a bottle. Other sources are Rizal National Agricultural School in Sampaloc, Tanay, Rizal, Pampanga Agricultural College in Magalang, Pampanga and Agricultural

Education Division of the Bureau of Vocational Education, Manila.

Preparing the Culture Medium

1. Materials:

1. Potatoes—200 grams
2. Dextrose powder—20 grams
3. Bacto agar—15 grams
4. Distilled water—100 cc

2. Procedure:

1. Peel the potatoes and dice them into 1" cubes.
2. Boil the diced potatoes in a liter of distilled water until soft.
3. Strain the decoction through cheese cloth.
4. Return the volume of the decoction to one liter and place it back in the casserole.
5. Add 15 grams of agar, heat slowly, stirring occasionally until the agar is dissolved.
6. Add 20 grams of dextrose powder and stir.
7. Dispense the hot solution in the test tubes. Pour 10 ml. into every test tube. Take care not to wet the mouth of the tube to prevent the cotton from sticking.
8. Plug the test tubes with

- cotton wad, neither too loose nor too tight.
9. Sterilize for 15 minutes in a pressure cooker or any suitable substitute at 120°C or 15 lbs. pressure. If an improvised sterilizer is used, boil the test tubes for 20 minutes for three consecutive days.
 10. Slant some of the test tubes at a 150 angle while medium is still in liquid state. Be sure that the agar does not reach the plug. The slants are for growing organism in pure culture. When allowed to cool in upright position, the slants are used to start petri dishes for isolation.
- d. Pull out the test tube and put back the cap tightly.
 - e. Sterilize the bottles with substrate in an autoclave or pressure cooker at 121°C or 15 lbs. pressure from 2 to 3 hours.
 - f. Set aside the sterilized bottles to cool, after which they are ready to be inoculated with the pure culture of mushroom organism.

2. Tobacco Midribs

- a. Secure the thoroughly dried tobacco midribs. Chop them into inch-long sections.
- b. Soak for 5 hours, wash thoroughly and wring.
- c. Ferment the midribs from 5 to 7 days and wash several times changing water every now and then.
- d. Bottle and process this substrate in the same way as the Brewer's dried grains.

3. Ipil - ipil Leaves, Coconut Coir, Wheat Bran.

The mixture of these materials as substrate has been used in the U.P. College of Agriculture in the ratio of 1:3:1. If wheat bran is not available, coconut coir dust and ipil-ipil leaves in a 3:1 ratio will make a good spawning medium.

- a. For every part of ipil-ipil leaves mix thoroughly 3 parts of coconut coir dust and 1 part of wheat bran.

- b. Ferment in water for 8 days. Stir once a day to get an evenly

Preparing the Substrate

Materials

A. Materials:

1. Brewer's dried grains (barley hull)
2. Tobacco midribs
3. Ipil-ipil leaves
4. Coconut coir dust
5. Wheat bran

B. Procedures:

1. Brewer's Dried Grains.
 - a. Soak the grains for half an hour and wring.
 - b. Fill the bottles with inch-thick of layers of brewer's grain, slightly packed.
 - c. Invert a test tube at the center of the layer. Continue to fill up the bottle loosely with the substrate to about an inch from the rim.

fermented product and to prevent the growth of molds on the surface. Bubbling, reddening of the matter and unpleasant smell indicate good fermentation. Do not over ferment because the leaves will dissolve during washing.

c. Wring the fermented materials and transfer them to another container filled with fresh water, then wash in three times.

d. After the last wringing, loosen the substrate for bottling.

e. Bottle and process the substrate in the same manner as the Brewer's dried grains.

Preparing the Pure Culture

A. Method:

1. Tissue culture method.
2. Spore culture method.

B. Procedure:

1. Tissue culture method:

- a. Wash the whole mushroom with 1 percent mercuric, bichloride or 5 percent chlorox.
- b. With scalp blade or knife, remove the outer covering of the mushroom.
- c. Cut the inner tissues into small pieces, the smaller the better.
- d. Place the cut tissues in a sterilized petri dish.
- e. Inoculate substrate with the tissue culture.

2. Spore culture method:

- a. Cut the newly opened mushroom underneath the umbrella.
- b. Lay the cap of the mushroom on a clean coupon bond paper for at least 30

minutes.

- c. Lift the umbrella. Spores will drop on the bond paper.
- d. With the aid of an inoculating needle, lift a portion of the mass of spores and plant it on the surface of planted potato dextrose agar. Plant on four sides to allow chances of growth.

Preparing the Mushroom Bed

The mushroom bed must be built on a firm foundation. It should measure about 25 cms. high and 80 to 90 cms. wide of any length desired. The site of the mushroom bed may be an open field, partially or completely shaded.

Around the foundation, dig a ditch about 25-30 cms. deep. The soil dug from the ditch may be used to build the foundation. Pack and level the foundation well to prevent it from crumbling while the bed is being made.

Planting Procedure

Place the first layer of straw or water lily bundles across the soil foundation with the butt ends on one side. Fold the tips under if the bundles are longer than the width of the foundation. Do not let these ends hang by the sides. Lay the bundles close to one another.

Keep on watering the layer until the water runs off the bed, then press the materials as they are laid.

A portion plump spawn (about the size of a thumb) along the sides from 6-8 inches apart and about 3 to 4 inches from the edges,

then insert the spawns inside the layer to insure even seedlings.

Arrange the next layer of bundles on top of the first layer. The butts should be in the opposite direction so that the bed will be level. Water and plant as in the first layer.

Repeat this procedure until the bed has six layers and is about one meter high. Trim the sides of the layers and mound the trimmings together with any left over soaked straw on top of the bed.

It is the weight of the layers that induces the organism to produce mushrooms. Next to good spawn, temperature and moisture are the most important factors in mushrooms growing. The materials have to be pressed down tightly because they must reach a temperature of 40 to 45 degrees centigrade in 3 to 4 days. This temperature is favorable to the growth of mushroom fungus but not to other organisms.

Care of the Mushroom Bed

Just the right amount of water will make the mushroom grow. Without water or too much of it will kill the organism. Good judgement therefore must be used in determining the right amount of water hose to distribute water evenly.

Watering is not necessary in places without a distinct dry or wet season. However, in places with a long dry season, watering is a must, especially if the bed is in the open field. Use a sprinkler or water hose to distribute water

evenly.

If mushrooms are in the shade, no watering is needed during the dry season, and certainly not at all during the rainy season. The mushroom bed should be covered with a thicker mound of straw during the wet season.

See to it that the ditch surrounding the bed is always filled with water. This keeps the air moist and prevents crawling insects and other pests from entering the bed.

It is not advisable to spray the bed with insecticides because the residual effects on mushroom have not been studied.

The most common disease of mushrooms is the soft rot. Damage from soft rot may be minimized by proper harvesting and prompt removal of infected mushrooms and by not watering the infested beds.

Harvesting

One week after the bed is planted, small white bodies about the size of radish seeds appear on the spots where the pieces of spawn were inserted. These develop into buttons in three to six days.

The best time to harvest mushrooms is when they begin to emerge from the volva, which is the membranous sac enclosing the mushroom. Each harvest yields about twenty to twenty-five kilos.

After the initial harvest, mushrooms come out in flushes within five to seven days intervals for a period of two or more months. At the end of this time, the rice straw

is already decomposed and exhausted of nutrients. Tear down the bed and make a new one for another crop of mushrooms. The used materials can be utilized as fertilizer for other plants.

Tips for Proper Harvesting

Mushrooms should be harvested properly to obtain the best results. Do not harvest them by cutting. Twist them off carefully without leaving any stumps which are likely to rot and produce bacterial infection.

They should be packed loosely in a basket after they are gathered. Stale mushrooms are known to be poisonous.

Fresh mushrooms taste better when harvested as buttons or newly opened. Mushrooms are no longer fresh twenty four hours after picking, as their caps have lost their firmness.

Preparing Mushrooms for the Table

All parts of the Volvaria mushroom from cap to stem may be eaten. Wash the mushrooms under running water, but do not soak them so they will not lose their flavor.

Food technologists report that the vitamin and other nutrients of the mushroom are retained during cooking, drying, freezing and canning. Evidently, however, fresh mushrooms are tastier than the preserved ones.

Appreciated more for their flavor rather than their nutritive value, mushrooms go into a variety of recipes, two of which are given

below:

Ingredients:

- 4 tablespoons flour
- 4 tablespoons lard
- 1 cup chopped mushrooms
- Mushroom Sauce
- 6 cups boiling stock
- Salt and pepper

Procedure: Melt the lard in a saucepan. Add flour and mix well. Cook for a few minutes without letting the flour take on color. Add the boiling stock, two cups at a time, stirring the mixture vigorously with a laddle. Add the mushrooms, salt and pepper. Cook the sauce stirring frequently for about one hour, skimming it from time to time until it is reduced to two-thirds its original volume and has the consistency of heavy cream. Strain the sauce through a fine sieve. Spread this sauce over cold ox tongue or boiled chicken breast.

Procedure: Saute 3 cloves of crushed garlic in 5 tablespoons of lard. Add 1 cup chopped pork and cook 5 minutes. Add 1 sliced onion, 3 tablespoons soy sauce, 1 cup so-tanghon (previously soaked in cold water for 10 minutes) and 1-1/2 cups fresh, quartered mushrooms. Saute together, stirring occasionally about 3 minutes. Add 2 cups rice water and simmer until pork and vegetables are well done.

Extracted from pamphlet produced by National Media Production Center in line with the Nation's green revolution, in cooperation with BPI and PRRM.

The Samaka Song

Words and Melody by CMH

Arrangement by Prof. Lucio San Pedro

Tempo di Marcha

Piano

1. U — nit — ed, to geth — er, we far — mers of the land, — To —
 2. So all that we need is to use our i — dle hours, — Res —
 3. When we have a — dopt — ed the rich SA — MA — KA way, — We
 4. No long — er so hun — gry, we're strong — er than be — fore, — No
 5. So now all to — geth — er, we. praise SA — MA — KA ways, — And

geth — er each pledg — ing to lend a help — ing hand, —
 for — ing to life all our long — neglect — ed pow'rs. —
 bring to our fami — lies three am — ple meals a day; —
 long — er in debt for the food bought at the store; —
 tell all our neigh — bors, SA — MA — KA sys — tem pays.

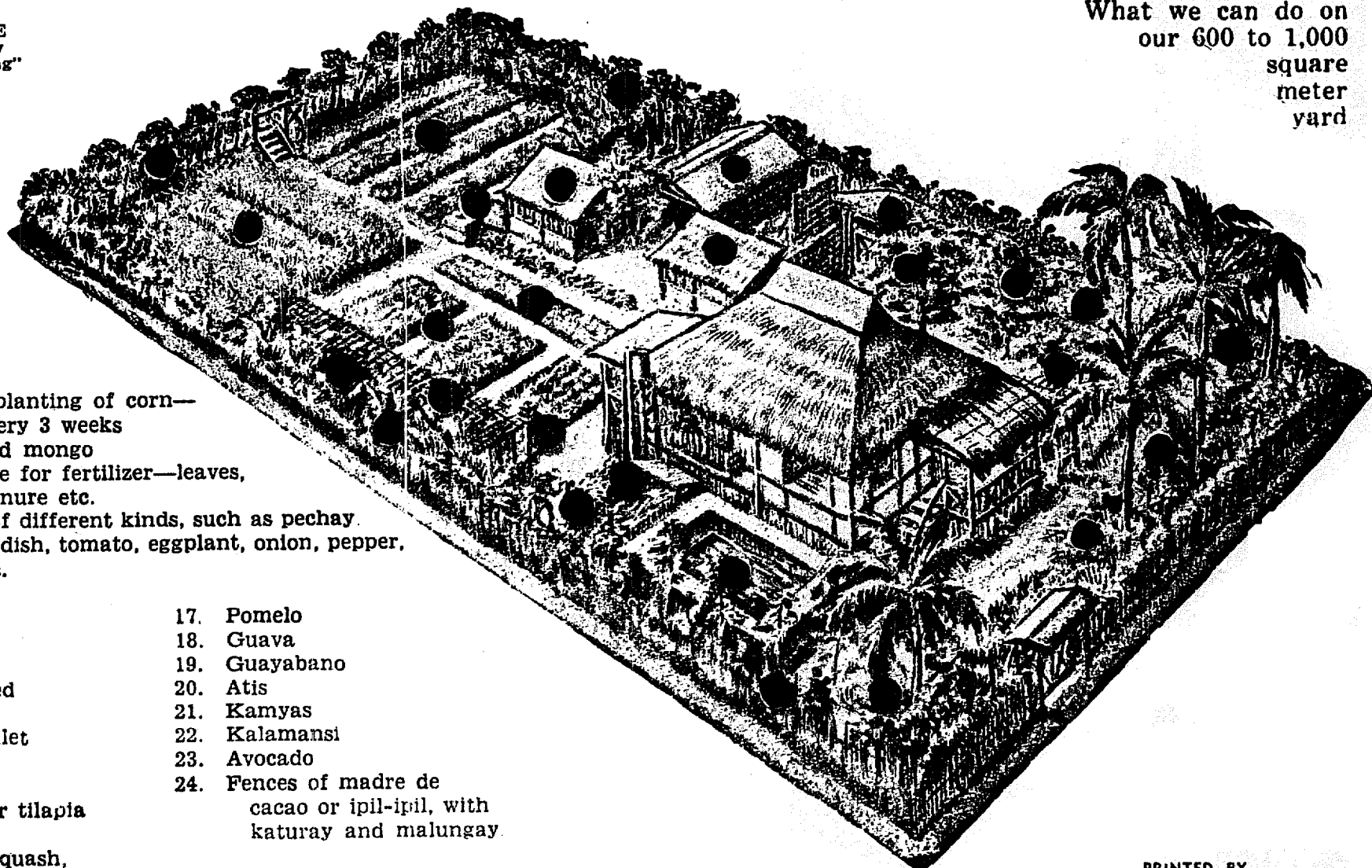
Work — ing to take greater rich — es from the earth, —
 Us — ing with wis — dom and care our precious soil, —
 Chick — ens, and fruit trees, — vege — ta — bless — d swine, —
 No sick — ly child — ren, we see them grow — ing tall; —
 For — ward, u — nit — ed, in — vin — ci — ble we stand; —

God — of — fered fruits from the country of our birth. —
 Rich — er our har — vests and making joy of toil. —
 Grown in our gar — den, and lasting extra fine. —
 No call — ing doc — tors, there's better health for all. —
 Bar — rio — far — mers, the masters of the land.

MODEL OF SAMAKA HOMESITE FARM

From "The
SAMAKA GUIDE
to Supplementary
Subsistence Farming"

What we can do on
our 600 to 1,000
square
meter
yard



1. Succession planting of corn—
4 rows every 3 weeks
2. Camotes and mongo
3. Compost pile for fertilizer—leaves,
straw, manure etc.
4. Vegetables of different kinds, such as pechay,
lettuce, radish, tomato, eggplant, onion, pepper,
garlic, etc.
5. Coffee
6. Bananas
7. Pigeons
8. Pigshed
9. Carabao shed
10. Chickens
11. Sanitary toilet
12. Garden well
13. Ducks
14. Fishpond for tilapia
15. Papayas
16. Trellis for squash,
upo, ampalaya
17. Pomelo
18. Guava
19. Guayabano
20. Atis
21. Kamyas
22. Kalamansi
23. Avocado
24. Fences of madre de
cacao or ipil-ipil, with
katuray and malungay

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