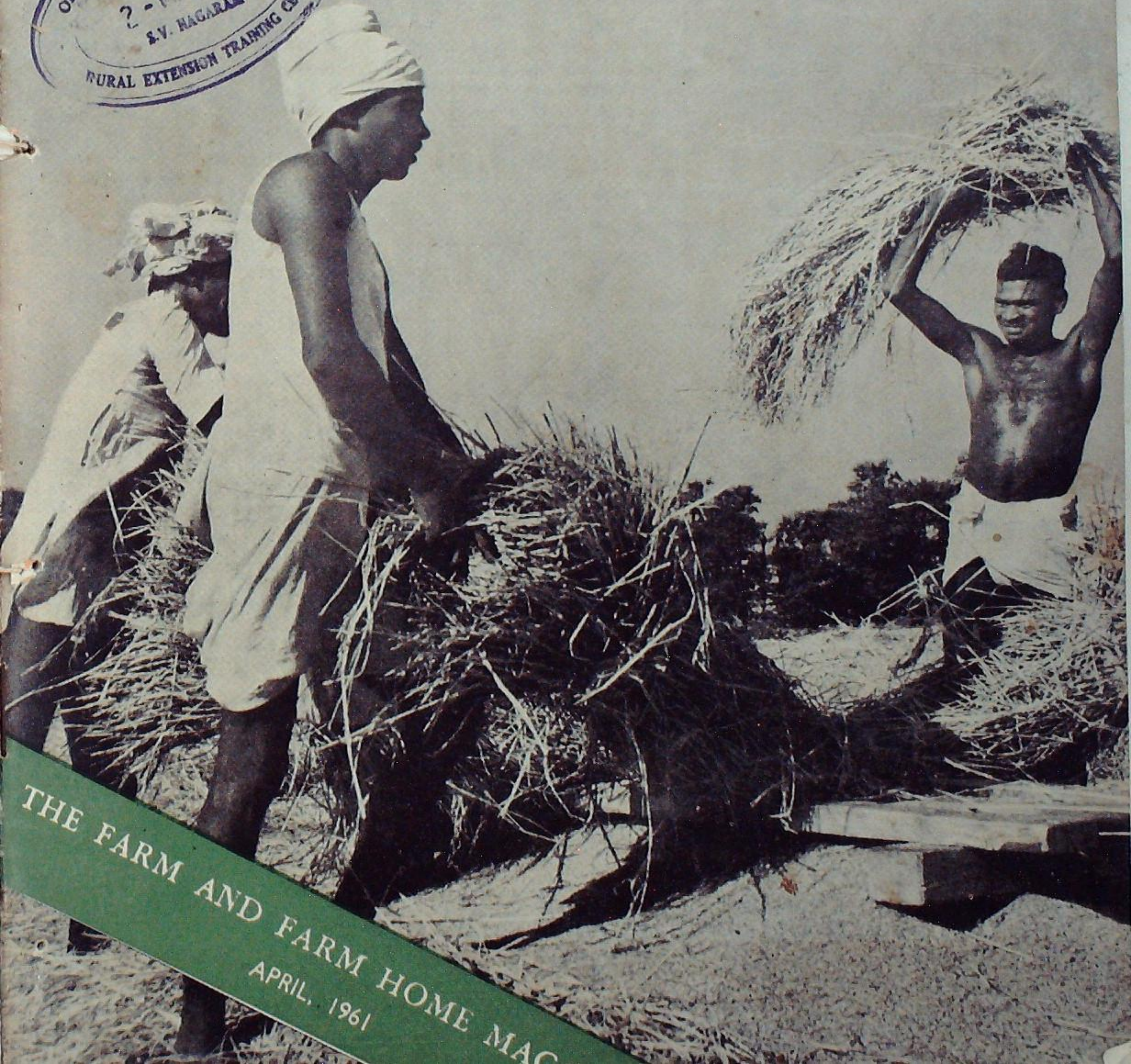


EXTENSION

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THE FARM AND FARM HOME MAG
APRIL, 1961

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MANURES AND FERTILIZERS

Compost is easy to prepare
Green manuring
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Facts about fertilizers
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Papaya is easy to grow
Drumstick, the year-round vegetable
Growing grapes in south India
Rabi vegetables—grow them this way



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How to fight coccidiosis in poultry
Feeding poultry for profit
Do your hens pay?
Protect your poultry birds against Ranikhet
Save your fowls from tick fever
Fighting fowl pox in poultry
How do you transport your poultry birds
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Culling poultry for profit
How to make a brooder for your chicks
How to start a poultry farm
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Virginia tobacco leaves have been harvested, and brought from the field to the barn. They are now strung on bamboo sticks $4\frac{1}{2}$ feet long. Leaves are tied in bunches of three on both sides of the stick. A single stick thus holds 90 to 93 leaves.

This much the farmer knows. But here is a tip.

While stringing the leaves, grade them into light and dark shades of green. Load the greener leaves in the upper portion of the barn and those with lighter green colour in the lower tiers. This way, you get better results.

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GROW

SOYABEAN

FOR FOOD AND FODDER

SINCE many years, soyabean is being grown in India. Yet, there are but a few farmers who grow it. The area under soyabean is small.

The reason for this small acreage under soyabean is that people, except in the Himalayan regions, do not know the soyabean well. They do not know that it is one of the very best food-cum-fodder crops.

Soyabean is a very good food. The bean has a high oil-content, and the kernel is rich in proteins. It also contains important minerals; more of calcium and phosphorus than any cereal, more than even peas and beans. It is rich in iron, potassium, magnesium and vitamins.

Soyabean oil, like groundnut oil, can be used for cooking.

Soyabean flour or the cooked bean is very good for diabetic patients.

Green pods and mature soyabean grains are a richer food than peas and beans. You can make good *chapatis* with one part of soyabean flour mixed with four of wheat

flour. You can make tasty biscuits and cakes from the flour too.

Bitter taste? The new varieties recently evolved have none. Mixing with wheat flour also reduces the bitter taste, if any. If you steam soyabean flour, the bitterness goes off.

Store the flour in a cool and dry place, and it won't get rancid.

In many countries, they prepare milk and curd from soyabean. Both have a good taste, and are nutritious.

Soyabean oil finds many uses in industry. They use it for paints and varnishes and for soaps, and also for food products.

The soyabean meal is used in making plastics and a good glue. It can be fed to poultry as a protein food. Add mineral mixture to the cake or soyabean meal and you have an excellent poultry feed.

Soyabean gives a good hay. Cattle fed on this hay give more milk.

For hay, you have to cut the crop when the pods have formed completely, the beans have developed well, and the lower leaves are turning yellow. Place the cut fodder on wind-rows to dry slowly in the field for three or four days.

Remove this hay when it is still a little moist, heap in a dry place and allow to dry. After a week, you can store the hay in your stacking yard.

But don't feed your livestock with soyabean hay alone. Better chop the hay and mix it with four times its quantity of *bhusa*.

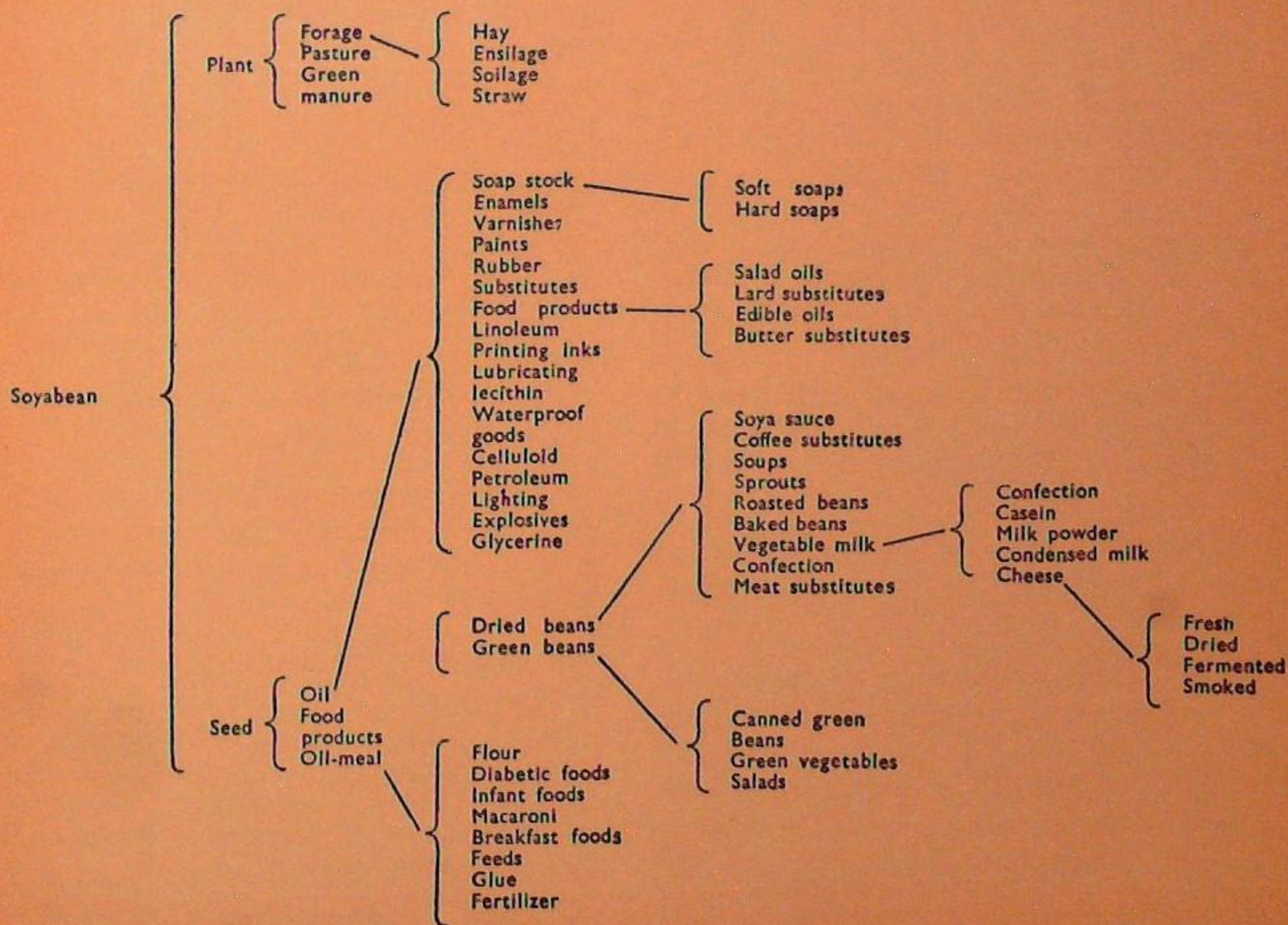
You can raise soyabean as a fodder crop too. Sown in early August, it gives fodder up to November. When no other legume fodder is available, it will come in handy for feeding your milch cattle.

Soyabean, being a legume, makes the soil more fertile where it is grown.

WHERE TO GROW

You can grow soyabean in the drier areas of the country where the rainfall is 35 inches or less. It can be grown at elevations up to 6,000 feet above sea level especially in Assam, Orissa, West Bengal, Manipur, the Khasi and Naga Hills and the Kumaon Hills of Uttar Pradesh.

SOYABEAN - ITS VARIOUS BY-PRODUCTS



WHAT VARIETIES TO GROW

Several varieties have been tried and found suitable for growing in our country. *Palmetto*, *Monetta*, *Clemson*, *Creole*, and *Charlee* are some of the good ones. *Monetta* has given the highest yield of seed in experimental plots.

The Punjab variety, *Punjab No. 1*, has given a yield of 34 maunds of bean an acre. This soyabean is not bitter in taste. *Type 33*, an early maturing variety, is recommended for the Himalayan districts of Uttar Pradesh; *N-49* and *Burette* are other good varieties.

HOW TO PREPARE THE LAND

Plough the land with a mould-board plough. Remove the stubbles of the previous *rabi* crop. Break up the soil by giving four ploughings with the *desi* plough or by working the *bakhar*.

If the land is heavy, roll or plank the field till all clods are broken. Don't sow when the field is cloddy.

HOW TO SOW

Sow after the rains set in. Though you can sow from early July to mid-August, the second half of July is the best time for sowing.

Drill the seed one to two inches deep using six to eight seers as your seed-rate in moist soil. Cover lightly by planking the soil.

Soaking the seed in water for 12 hours, they have found in the Punjab, increases germination.

When sowing soyabean for the first time, it is necessary to supply the soil with the bacteria which help the crop to grow quick. You will also get 10 to 40 per cent more yield.

You can get the bacterial inoculum from the Chemistry Division of the Indian Agricultural Research Institute, New Delhi, or from your State Agricultural Chemist.

For inoculating the soil, first mix some milk with soil containing the bacteria you get from the Institute or from your State Agricultural Chemist. Use about half a seer of milk for four ounces of the bacterial culture. Allow the mixture to stand for about 6 to 12 hours. With this you can treat about 20 pounds of soyabean seed. Sprinkle the mixture over the seed, and mix by turning and stirring. Spread the beans to dry in shade. Do not dry in the sun. After drying, sow the seed.

WHAT FERTILIZERS TO USE

Soyabean needs good quantities of nitrogen because of the high protein content of its seed. A crop which yields about 22 maunds of beans per acre removes 128 pounds of nitrogen, 44 pounds of phosphoric acid and 81 pounds of potassium.

Experiments at the Indian Agricultural Research Institute, New Delhi, show that if you give your crop 40 pounds of nitrogen (200 pounds of ammonium sulphate) and 40 pounds of phosphoric acid (250 pounds of superphosphate) you can get good soyabean yields. If your soil lacks potash, apply 50 to 100 pounds of muriate of potash also.

Apply a third of the ammonium sulphate and all superphosphate (and muriate of potash also if this be needed) at sowing. Drill these on the side of the seed-lines.

Apply the rest of the ammonium sulphate at the mid-bloom stage.

You can also apply 10 to 12 cartloads of good cattle manure. Sludge manure is also good. You would need three tons of this to the acre.

WHEN TO INTERCULTURE

When the crop has germinated, work a bullock-drawn Akola hoe, *triphaly* or a five-tined cultivator.

Thin the crop to give a spacing of 12 inches between plants.

Three interculturalures and one or two weedings are sufficient, but important, for the crop.

Ridge the crop sown in mid-July after six weeks of growth. The earthing up will drain the excess water, and help the roots to become firm.

WHEN TO IRRIGATE

If you are sowing a short-duration variety, you don't need to irrigate, unless the rains fail. Where the annual rainfall is less than 20 inches, and where the rains stop in early September, you have to give an irrigation in the third week of September. This is the time when pods are formed.

WHAT MIXTURES TO GROW

Soyabean can be grown mixed with maize, in alternate rows, 12 inches apart. Give a spacing of 12 inches between maize plants and 6 to 8 inches between soyabean plants in rows.

Both the crops need large amounts of plant food. Hence, when you grow such a mixture, apply 400 pounds of ammonium sulphate and 300 pounds of superphosphate to the acre. Apply half the dose of ammonium sulphate when both the crops start flowering.

N.P. 2 (yellow maize) and *Clemson* (soyabean) are good for raising a mixed crop. The first takes 110 to 120 days and the second 70 to 75 days to mature. Harvest them separately.

HOW TO GROW FOR FODDER

Sow soyabean thick for fodder. Drill the seed 12 inches apart, and give a spacing of 4 inches between plants. You will need 9 to 12 seers of seed to sow an acre.

Choose a long-duration variety such as *Yellow* and *Chocolate*. You can also use *Black*, which matures 30 days earlier than the first two, if you like.

An acre of soyabean will give you 125 to 175 maunds of fodder per acre.

HOW TO CHECK DISEASES AND PESTS

Watch for diseases and pests. Soyabean may get the mosaic and downy mildew diseases and attacks from pod-borers and leaf-hoppers. Act quickly when these appear and control them.

When you see leaves start turning yellow, it may be mosaic. The disease is spread by insects. Uproot such plants as soon as you notice the disease in a young crop and destroy them.

In very wet weather, downy mildew appears. You will see greyish brown to dark brown lesions or spots with white margins and greyish masses of spores (a powdery material) on the undersurface of leaves. Spraying with Bordeaux mixture will end the trouble.

You will see the green pod-borer as a caterpillar feeding on the green pods. There is also another pest called the armyworm.

In dry years, you may also see leaf-hoppers damaging your crop. These also spread diseases from one plant to another.

Ask your Gram Sevak or Agricultural Officer to tell you how you can use BHC or DDT to control these pests.

HOW TO STORE SEED

If you are not careful about how you store soyabean for seed, it will give you poor germination.

Hence, dry the seed carefully after harvest, and store in a dry and cool place, free of insects. Better disinfect the store or godown before storing the seed.

Seed containing too much moisture gives poor germination. Seed stored for eight to ten months does not germinate at all.



SORE NECKS

ARE NO GOOD

SORE necks or yoke galls are troublesome. And you should see that your work animals don't get them.

Work bullocks and other work animals get yoke galls because of badly-fitting yoke of the plough or cart. Working in the rains also results in animals getting yoke galls.

Hence, see that the yoke you use with the plough or the cart properly fits the neck of the work animal. Also see that you use an equal pair of animals for the plough or the cart.

When animals get yoke galls, don't use them for work. Foment the affected part, clean the galls with a weak phenyl lotion or potassium permanganate lotion (1 part of the chemical in 1,000 parts of clean water) Let it dry.

Apply any one of the following dressings next.

Zinc oxide 1 part
Vaseline 8 parts
(Mix thoroughly and use as an ointment)

or

Powdered charcoal $\frac{1}{2}$ ounce
Zinc sulphate 1 ounce
Lead subacetate 1 ounce
Bismuth subnitrate $\frac{1}{4}$ ounce
(Mix with glycerine to make a paste)

or

Powdered borax }
Powdered charcoal } Equal parts
Powdered alum }
Powdered copper sulphate }
(Use as a powder for dressing).

You can prevent the galls from forming if you massage the neck with a mixture of camphor and sweet oil each time you lift the yoke.

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Lucerne is a round-the-year fodder

VERY HOT SUMMER ? FREEZING WINTER ? VERY WET MONSOON ?
LUCERNE WILL NOT MIND ANY OF THESE

By P. C. RAHEJA

LUCERNE is the fodder crop that can stand very hot summers as much as very cold winters. It can grow in very wet areas as in Assam as easily as in the very dry areas as in the Punjab or Rajasthan.

If you grow it in the hill areas, it will give you fodder in the summer. Down in the plains, it gives you the fodder in the winter.

However, farmers in the North prefer berseem to lucerne. This is so because lucerne does not yield more fodder than berseem, and yet, it has to be kept in the field throughout the year. Berseem can be rotated with *kharif* rice, maize, *jowar* or *bajra*.

Yet, lucerne has its own good points. It can be used for reclaiming alkaline soils. If there is a long period of drought, lucerne will still grow, by sending its roots deep, where moisture can be had.

The deep, black cotton soil is the best for lucerne. But you can grow it on loam and alluvial soils with good results. Red and laterite soils are not that good for lucerne. Sandy soils don't give good lucerne crops, nor do the water-logged ones.

VARIETIES TO SELECT

The Punjab has two good varieties of lucerne for farmers to grow. One is *Type 8* and the other, *Type 9*. Both grow fast. The former branches well, while the latter is more leafy. Both varieties are good for the arid areas of the State.

In south India, the *Kandhar* (or *Quetta*), the *Persian* (Arabian) and the *Meerut* varieties are grown. The *Kandhar* trails on the ground, and is being replaced by the *Persian*, which is more vigorous in growth.

PREPARING THE LAND

Clear the land of weeds. Plough the land and harrow with a *bakhar*. Then plough with a *desi* plough five or six times.

Level the land. This helps prevent water-logging, and also allows the crop to come up well.

MANURING THE CROP

In military farms, they apply 10 to 12 tons of farmyard manure to the acre a month before sowing.

Applying 60 to 80 pounds of phosphoric acid an acre is found to be the best fertilizer for lucerne. Drill this as superphosphate in September, in between the rows. Neither nitrogen nor potash is normally applied to this crop unless the soil lacks it.

SOWING THE SEED

If you are sowing lucerne in a new area, it is better to mix the seed with a bacterial inoculum before sowing. Ask the Agricultural Chemist of your State for the supply of this culture.

You can sow lucerne broadcast or in lines.

If broadcast, you will need 12 to 14 pounds of seed. Mix it well with the soil with a rake.

If yours is a sandy loam or a loam, and you want to sow in lines, sow in rows 9 to 12 inches apart in flat beds. In case your soil is a heavy black soil, sow on ridges. You will need eight to ten pounds of seed an acre for sowing in lines.

The source of water for irrigation decides the size of beds. Normally, the beds measure ten feet by ten feet. Some even make bigger beds.

In a warmer climate, lucerne is sown in October or February. In the plains, October is the best, and on the hills, February. Late sowings in both the cases should be avoided.

In south India, lucerne is sown in June, so that it may get the benefit of the monsoon.

IRRIGATING THE CROP

Lucerne needs frequent watering, once in 10 to 12 days in the autumn and summer months. In winter, you can give water once in three weeks; during the rains no watering is necessary.

Shallow, frequent irrigations are better than deep irrigations at longer intervals.

INTERCULTURING

Don't let weeds come up and kill the young lucerne plants. If you have broadcast the crop, then hand-weed the field. For a drill-sown crop, work a *desi* plough to kill weeds at short intervals.

PESTS AND DISEASES

You may come across the leaf-eating caterpillars on your lucerne crop. Stirring the soil between rows of the crop will keep the pest in check. As soon as you notice the caterpillars weaving leaves of the plant together, cut the fodder; cut every time you see such woven leaves. Frequent cuttings reduce the damage.

In the cold months you may see downy mildew on the leaves. Frequent cutting of the crop also helps reduce damage by this disease.

CUTTING THE FODDER

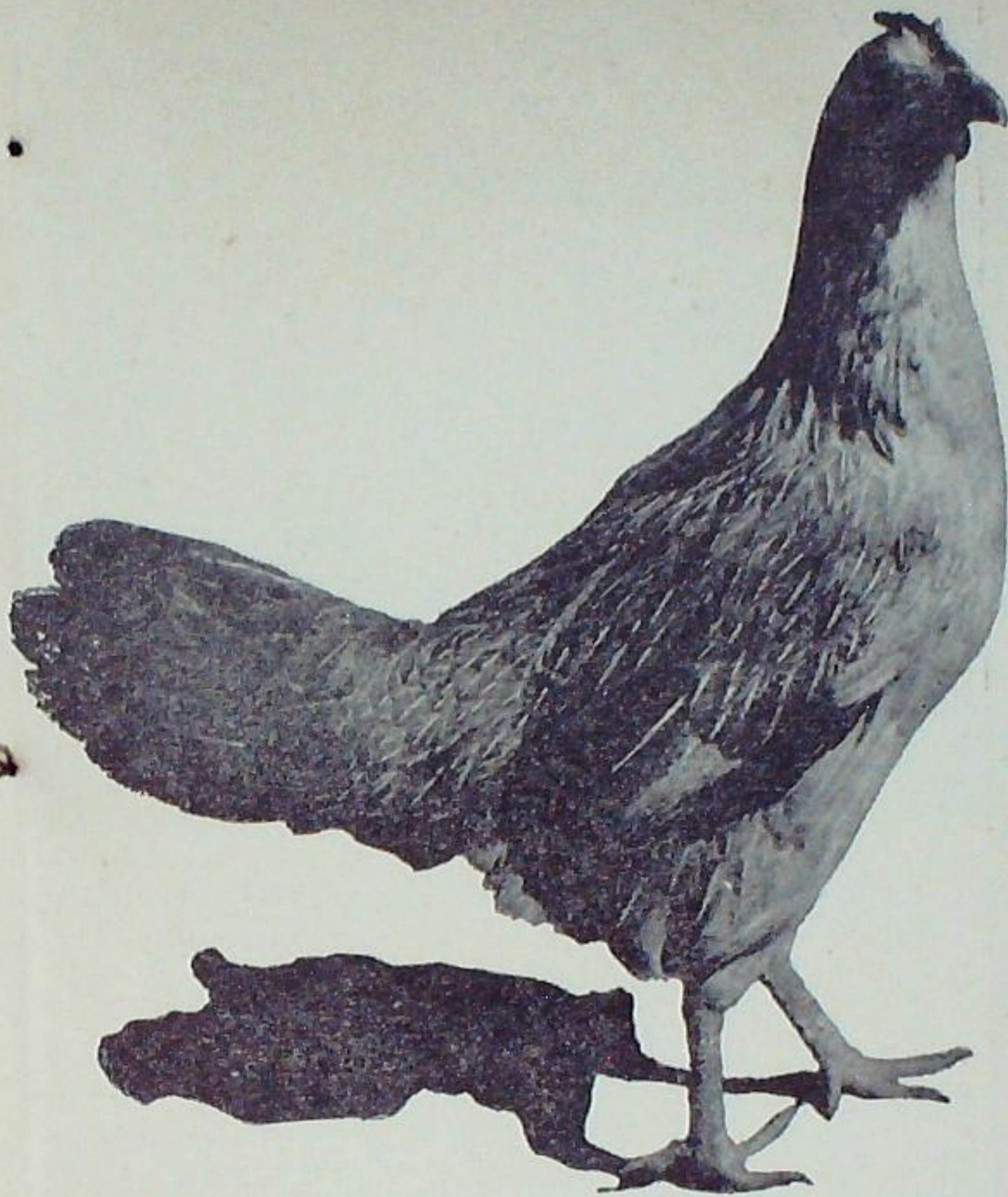
If you had sown the crop in October, you can take the first cutting in late January or early February. Thereafter, you can get a cutting every month or a month and a half.

In south India, when the crop is sown in June or October, the crop is ready for cutting in six months.

With frequent cuttings, you will get more uniform growth of the crop.

In north India, you can obtain six to seven good cuttings a year. With heavy manuring, as many as 10 to 12 cuttings a year are obtained in some of the farms in the South.

An acre of lucerne gives 600 to 650 maunds of green fodder in the North and 800 to 900 maunds in the South.



There's nothing wrong with the *desi* hen. Given the chance, she too can lay a 100 eggs a year, on an average

By S. G. IYER

THERE is nothing wrong with our village hens. It is not her fault if she has been laying but an average of 53 eggs a year—eggs weighing a little over an ounce each.

We have some 94 million fowls in this country, of which 36 million are laying birds. Ninety-five per cent of the birds are kept in our rural areas, in small units of four to ten each.

May be, you are also one of those who keep village fowls. If so, it is likely that you also hatch and breed with the broody hens, leave the birds to search for their own food and keep them in poor housing conditions.

No wonder you also lose half the birds you rear due to poor feeding, diseases or poultry enemies.

But with some care, you can make your small flock a paying one. There is today so much demand for eggs.

The village hen is a hardy bird. She can live under difficult village conditions. Given good food, she can lay a 100 eggs a year like some of the improved breeds.



**GET
A HUNDRED
EGGS
FROM
THAT
DESI HEN**

HOUSING

Don't let out your birds in a free range. They need protection from the rain and the sun, and from their enemies. Build them a house, and have a run or a yard around the house for them to run about. Have a fence of 5½ feet around the run, so that they remain within the area.

Build any type of house you like, but see that it is well ventilated, can be easily cleaned, and is free from ticks. Ticks are the biggest enemy of poultry birds.

Don't overcrowd birds in the house. Give each hen a floor space of at least one square foot. For the run (or yard) limit 200 hens to the acre. If you are rearing young birds, this number can be raised to 400.

BREEDING

It is not necessary to get rid of your *desi* hens. Remove all the *desi* males, and sell them. Buy some males of an improved breed like the White Leghorn or Rhode Island Red. You can get these birds from your Block Development Officer or Government Poultry Farms. Let these males run with your *desi* hens.

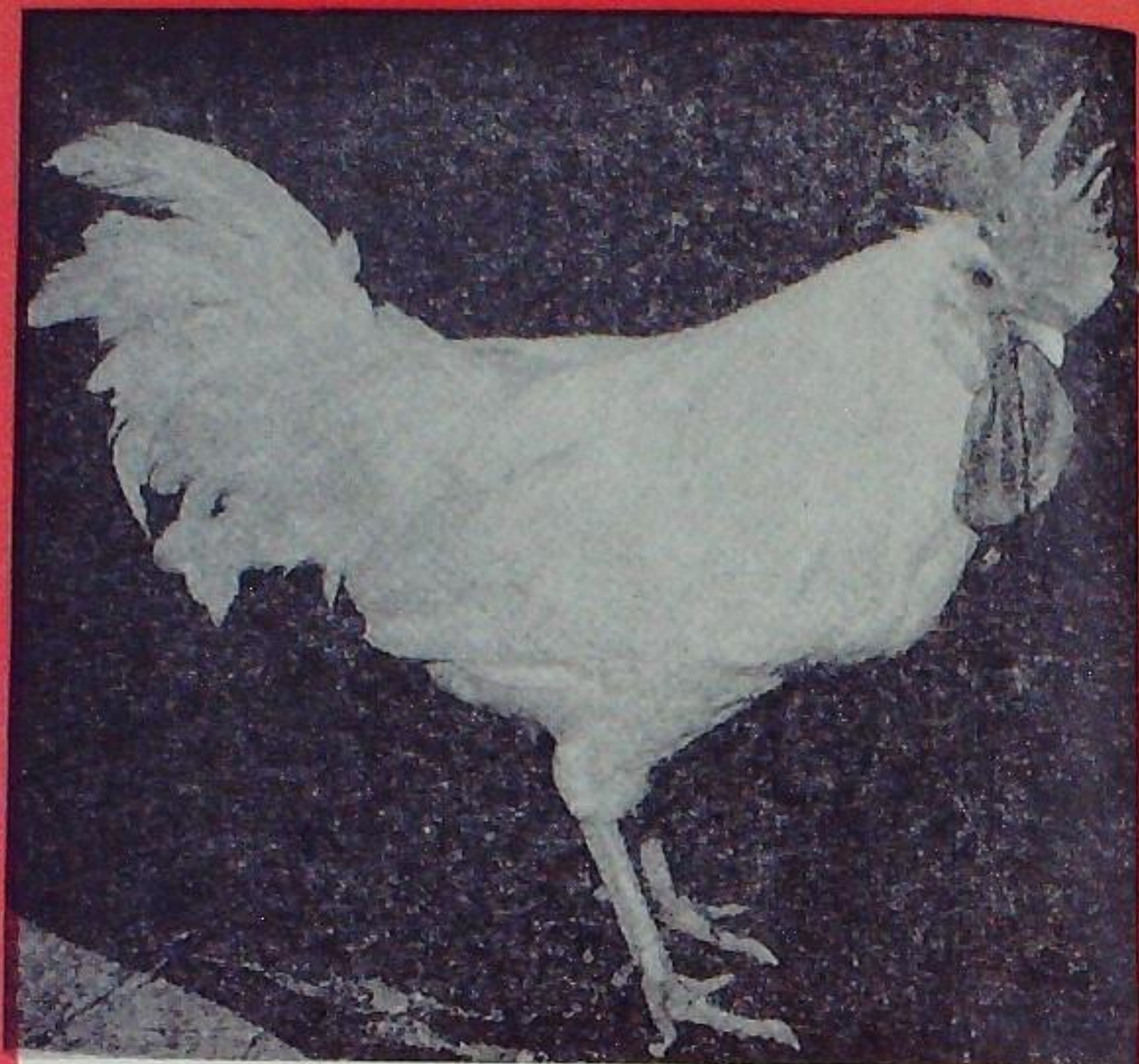
Save as many eggs as you can from the hens during the breeding season (October to March). Get the eggs hatched at the Government or Block hatchery, if one is nearby.

The chicks that hatch out are crosses, and grow fast, mature early and lay more than even pure bred hens. The eggs they lay will be of a bigger size than those laid by the *desi* hens.

Before these cross-bred chickens mature, remove the males and sell them. Keep the best among the female chickens for breeding in the next season.

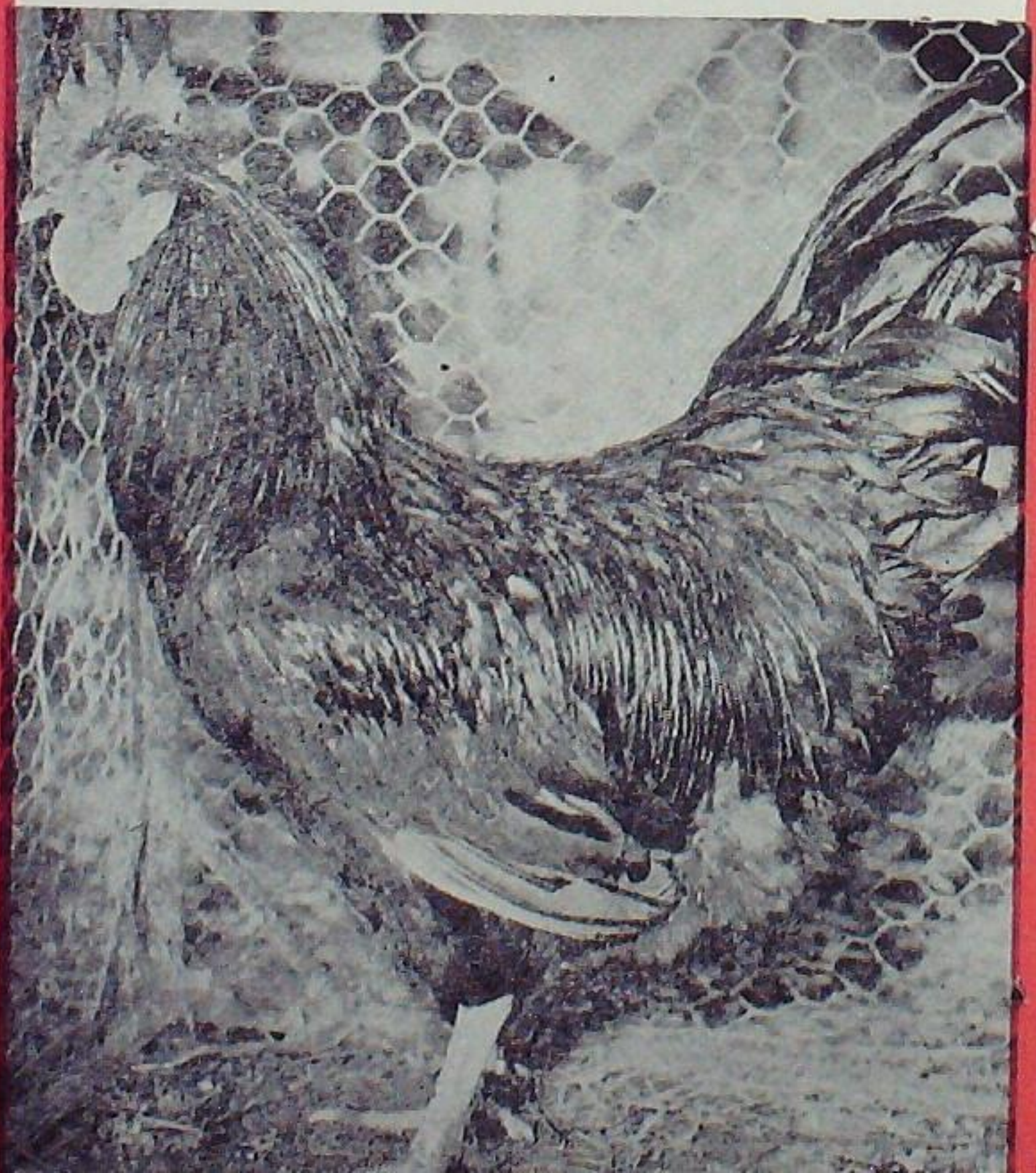
Mate the cross-bred females only to cocks of the pure breed, that you used for mating their mothers.

This process is called 'up-grading.' Continue up-grading for five generations. After this, you can use both males and females for breeding.



A White Leghorn cock is ideal for up-grading a desi flock...

...so also is a Rhode Island Red



An up-graded hen after the fifth generation looks like a pure bred hen, but she will have the good qualities of the *desi* hen. She can stand village conditions well, and can lay better.

You can also keep a few hens of the improved breed to run with the *desi* hens. Mated to pure bred cocks, they will give you good males which you can use for breeding.

FEEDING

Your hens are like machines. They feed on the food you give, and use a part of it to produce eggs.

The food you give them consists of cereal grains, cereal by-products, oilcakes, by-products of animal origin and green foods.

The food you give them, however, should have

carbohydrates,
fats,
proteins,
minerals,
vitamins, and
water.

Cereals are cheap, and good for your birds. They can form the bulk of the feed. But they don't contain enough of proteins, minerals and vitamins. Hence, you will have to give the birds other feeds which contain them in addition to the cereals.

Animal proteins are good, but costly. Hence, give your birds a mixture of 2/3rd animal proteins and 1/3rd vegetable proteins.

Meat-offal is cheap. Use it freely as poultry feed. Along with the cereal, find an ounce of the meat-offal for a bird a day.

Use wheat-bran or rice-bran as a bulk feed. It can form 20 per cent of the total ration.

There are other cheap materials which you can use such as mango-seed kernal, *jaman*-seed meal, cowdung, molasses, silk-worm refuse and penicillin waste. Ask your Poultry Development Officer how you can use these.

Many village poultry-keepers use the all-mash feed. It is a complete feed, and you

need not give any more grain to the birds.

Here is a sample :

	<i>Parts by weight</i>
Ground yellow maize	30
Wheat-bran or rice-bran	20
Groundnut cake	35
Fish-meal or meat-meal	5
Ground limestone	3
Bonemeal (<i>steamed</i>)	1
Salt	1
Dried greens or fresh greens	5

(You can use oats, barley, *jowar*, *bajra*, *cheena*, *ragi* or *cambu* instead of maize.)

Mix the mash, and grind the same before feeding.

Give about two ounces of the mash to birds below eight weeks in age, and four ounces each to older birds.

BIRD HEALTH

Don't take risks with diseases. Ask your Block Development Officer for help in getting all your birds inoculated against Ranikhet and fowl-pox when they are four weeks of age.

Always keep a watch for lice, ticks and other insects on the birds. When you see any of them, get the powder that can kill these, from the Block Development Officer and dust your birds with it.

In case the birds catch an infectious disease, get immediate help from your Veterinary Doctor.

MARKETING

If there is a cooperative society for eggs in your area, you should sell your eggs through the society. If there is none, you should get other village poultry-keepers together to form one.

Handle eggs with care. They go bad quickly. Store them in a cool place. An earthen pot with some wet sand in it is a good place to store your eggs in. This way you can store the eggs in good condition for a week.

CROP PESTS AND DISEASES IN MAY

AND WHAT TO DO ABOUT THEM

By D.B. REDDY

THE fight against the crop pests and diseases should go on this month too. Here are the most important ones which you can expect, and also suggestions as to what you should do when you see them in the field.

<i>Crop</i>	<i>Pest/Disease</i>	<i>Control measures</i>
Cotton	Angular leaf spot or black arm	Treat seed before sowing with an organo-mercurial fungicide (1 per cent active material) at 1 : 250 parts by weight.
Jowar	Grain smut	Treat seed before sowing with fine sulphur dust at 1 : 250 parts by weight.
Paddy	Foot rot Helminthosporium Blast	Treat seed before sowing with an organo-mercurial fungicide (1 per cent active material) at 1 : 400 parts by weight.
Ragi	Foot rot Leaf blight	Treat seed before sowing with an organo-mercurial fungicide (1 per cent active material) before sowing at 1 : 400 parts by weight.
Sugarcane	Red rot	Use disease-free setts only. Do not plant in infected fields.
	Smut	Use setts obtained from fields free from the disease. Use resistant varieties where available.
	Stem-borer	Pull out the dead-hearts and destroy them by burning. Spray 0.1 per cent Endrin or other insecticides.
	Termites	Use 5 per cent BHC, Aldrin or Chlordane dust about 20 pounds per acre with the planting of setts.
Wheat	Loose smut	Treat seed with solar-heat method or give hot-water treatment where summer temperatures are not high.
	Earcockle	Remove galls from the seed by the floatation method.

Some of the pesticides like Aldrin, Endrin and organo-mercurial fungicides are very poisonous. Hence, be careful in using them.

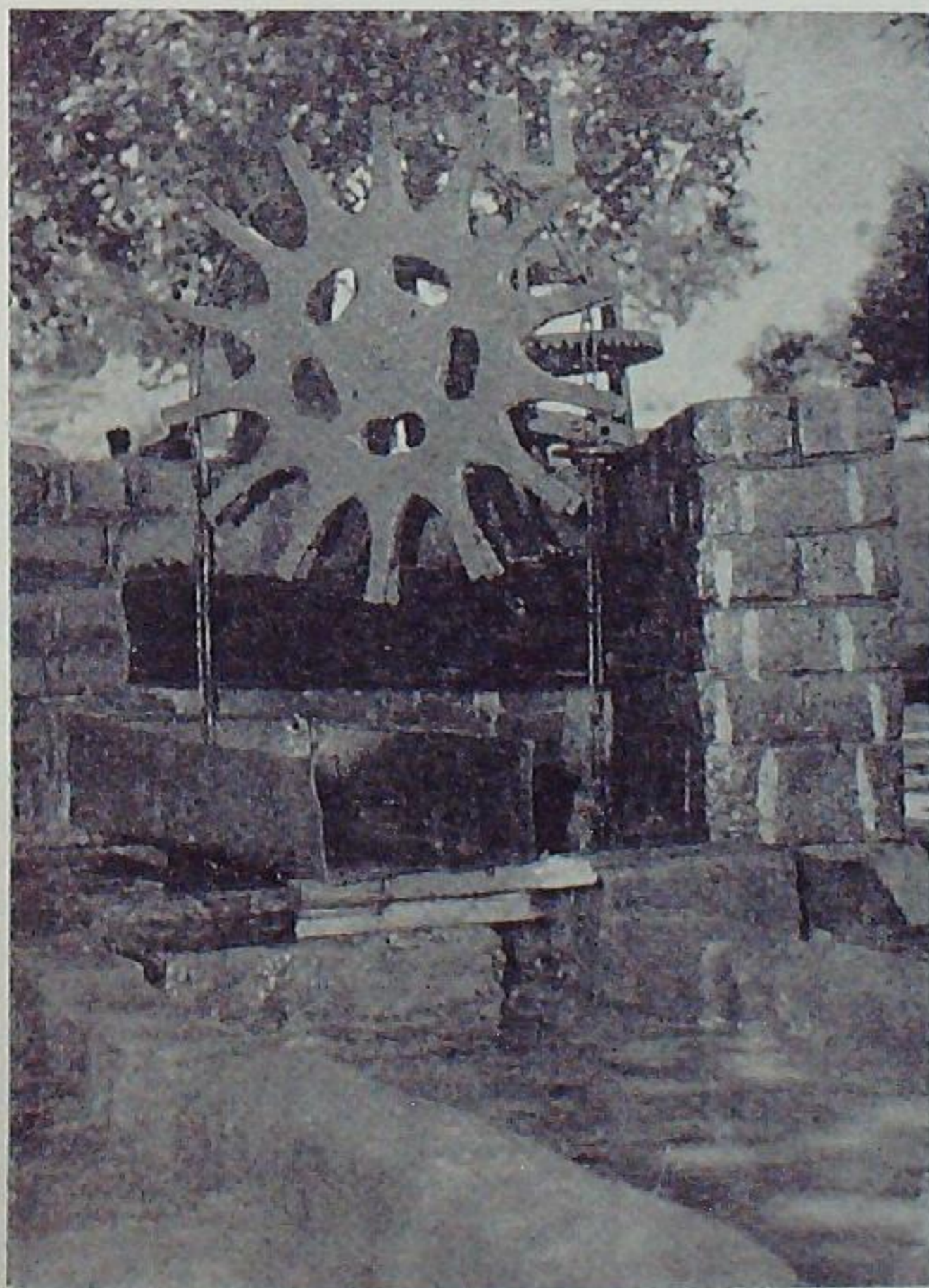


A NEW WATER-PUMP IN THE MAKING

SHRI Karam Singh of the Punjab has designed a water-pump which can lift as much as 5,500 gallons of water in one hour—almost double the quantity raised by the traditional Persian wheel.

The idea of such a pump came to him when he saw a Chinese water-pump model at the World Agricultural Fair held at New Delhi.

The new water-pump



But it needed some changes to work under Indian conditions. He, along with other workers, laboured hard, spent a lot of money and time, and at last got this water-pump made.

With this pump, Karam Singh claims, it is possible to irrigate about one and a quarter *bighas* (which is $2\frac{1}{2}$ *bighas* in Delhi area) in an hour's time. And that too with the help of a single bullock only!

Weighing 25 seers and made of angle-iron, the water-pump can easily be operated by a bullock.

The pump has a pipe joined to a wheel. This pipe does the water lifting with the help of washers fitted every five feet to the chain. The chain is further worked by the wheel attached with a free-wheel.

To make such a pump, it had cost Karam Singh about 375 rupees. If manufactured on a bigger scale, he believes, it will cost not more than Rs. 300.

—R.K. Mukker

BHINDI FOR PROFIT

A FARMER in Kansia village in Broach district of Gujarat is raising 21,000-rupee worth of *bhindi* from his ten-acre land.

The farmer Shri J. K. Amain says that the high yield is because of the variety *Pusa Sawani* he grows.

This variety, developed at the Indian Agricultural Research Institute, New Delhi, the farmer has found, yields high and is free from the yellow-vein mosaic disease. In yield, he says, it has beaten all the local varieties as well as *Pusa Makhmali*.

—B.N. Dave



WHY NOT GROW YAM?

THE FLESHY TUBERS OF YAM, SWEETER
THAN COMMON POTATO, HAVE ALWAYS A READY
MARKET, AND GROWING THEM IS SO EASY

By B.A. CHAUGULE and V.S. KHUSPE

IN Madras, Andhra Pradesh, Kerala, Maharashtra and Gujarat, housewives make a number of tasty preparations from the fleshy tubers of yam.

Yam is a chief source of carbohydrates. More nutritious than the common potato, it provides a wholesome food. The hill people in the South use yam in place of rice. In some areas, yams form a major part of the diet of the poorer people.

As a food, yam is cooked either by boiling, baking, roasting or steaming; either whole or in slices. It is sweeter than the common potato, and can very well be converted into a number of dishes. For this

reason yam is sometimes called the 'Indian potato.'

Yams give starch. The purple yam is sometimes used for colouring and flavouring ice-creams. Some yam varieties are used for producing alcohol.

Yam has always a ready market, and farmers find in it a good and paying summer crop. The Thana district in Maharashtra and Surat, Ahmedabad, Kaira and Broach districts in Gujarat grow yams in a large way.

Yam is a hardy crop. Yet, it requires sufficient rainfall to give well-developed tubers. Where the annual rainfall is 40 to 60 inches, the crop grows well. But where the rainfall is not sufficient, you will need to irrigate the crop.

The yam is a warm weather crop. The season, however, should not be too hot or too dry.

To grow yam, select a rich sandy loam or a deep and friable soil. In stiff heavy soils the tubers do not develop properly. Good drainage is important. The soil should be at least two feet deep. You can also grow it on a sandy soil if you provide it with plenty of organic matter and moisture. A deep fertile clay loam, when properly worked, gives the best results. Well-drained and highly fertile soils of Gujarat called, *Goradu*, soils, are highly suitable for yam.

PLOUGH THE LAND WELL

Plough the land seven to eight inches deep with an iron plough. Crush the clods and harrow twice or thrice to bring the soil to a fine tilth.

The crop needs heavy manuring. Hence, you need to apply at least ten tons of cattle or sheep manure per acre. Spread the manure evenly and mix it with the soil with the second harrowing. If sheep penning is possible, then the cattle manure can be reduced to seven tons per acre.

SELECT HEALTHY TUBERS

Mature tubers of the previous crop form the seed material for the new crop. Healthy tubers are selected during harvest and stored in a cool dry place in a shed for planting in the next season. You can obtain your seed material from the Gram Sevak or from other farmers who have been growing yam.

Planting starts towards the end of May or early June. Depending upon your soil conditions, you have to prepare flat beds or ridges and furrows or soil mounds for planting yam. At the farm of the Poona College of Agriculture (Maharashtra), best results were obtained when yam was planted on broad ridges.

Farmers in some areas of south India water the field first and then plant tubers in rows 24 to 36 inches apart. They use small tubers or pieces of the tuber of about three to four ounces in weight and plant them four inches deep. If you follow the ridge system, plant the tubers 18 to 24 inches apart on

the top of the ridges. If you are using a plough to make ridges and furrows, plant the tubers in every fourth row, spacing them 18 to 24 inches apart. The same spacing is given between tubers in the row.

You can also plant yam in mounds or against fence poles and trees.

Yam can also be grown with other crops such as ginger. For a mixed crop, plant the tuber five feet by five feet on the sides of broad ridges spaced five feet apart. Farmers in Gujarat raise the crop in flat beds with a spacing of about 2½ feet by 2½ feet.

If you are raising a pure crop, you will need 1,600 to 2,000 pounds of tuber for planting an acre. If you are growing it mixed with ginger, you would need only about 700 pounds of the tuber.

You can also grow yam in betelnut or coconut gardens as an intercrop. Again, when you grow it as a single crop, since it takes more than six months to mature, you can also raise any short-duration crop along with it.

IRRIGATE THE CROP PROPERLY

Irrigate the crop once every five days during the first two months. After the tubers have sprouted, irrigate once in seven or ten days. Yam needs plenty of water during the growing period.

When planted in mid-May, the crop needs three to four irrigations before the rains arrive. Thereafter, you need to give water only when there is a break in the monsoon. In the winter season, give about 10 irrigations once every 12 to 15 days till the crop matures. In the Deccan, 12 to 15 irrigations in all are given to the crop.

PROVIDE STAKES

When the tubers sprout, they produce one or more strong shoots. When the shoots are about a foot high, provide stakes. The stakes, which can be of bamboo, not only give support to the plants, but also help you in keeping the field weed-free.

When grown mixed with ginger, the yam gets the benefit of the interculture given to ginger.



Growing a 'ginger-yam' mixture pays

The crop responds well to top-dressing with fertilizers. At the Agricultural College Farm in Poona, the crop gave very good results when 40 pounds of nitrogen were applied in the form of ammonium sulphate in August and September and was earthed up.

HARVEST IN TIME

Tubers which are not fully mature do not keep well. Hence, harvest the crop only when tubers are fully ripe if you want to store the tubers. You can make out that the tubers are mature when the leaves of the creeper are seen drying; the older leaves turning yellow and falling off. The land around the base of the plant also cracks at this time.

While harvesting, see that the tubers are not cut or bruised. Each plant will produce one or two tubers. Separate the tubers from the plant after it has dried a little.

A good crop yields 16,000 to 18,000 pounds of tuber per acre. The average yield can be put at 13,000 pounds. Where the crop is mixed with ginger, you can expect 7,000 to 8,000 pounds of tuber per acre.

Store the tubers in a cool shade under dry earth or sand. Yam does not rot and is not attacked by diseases while in storage.

Some farmers leave the crop in the field and harvest it as and when they require.

THE WAY TO PRODUCE SANNHEMP SEED

By G. V. CHALAM

YOU will find producing sannhemp seed a problem, if you are growing the crop as a green manure.

Many farmers choose *sann* for growing as a green manure crop. It does not like waterlogged fields, but where it can grow, it gives 10,000 to 12,000 pounds of green matter per acre.

There are two *sann* varieties—one, the large-seeded, grown in Uttar Pradesh and parts of Bihar, largely for fibre, and the other, the small-seeded one, grown in south Orissa and coastal Andhra Pradesh.

The large-seeded variety is very good as green manure for the *rabi* season.

But, growing this large-seeded *sann* for seed in Orissa and coastal Andhra Pradesh

had not been a success, because its growing season is almost the same as of the rice crop, when it is about to flower and set seed the monsoon rains stop, and when it starts producing fruit the sannhemp pod-borer is also busy.

But as a *rabi* crop, *sann* can be raised for seed with success both in Orissa and Andhra Pradesh, especially if the small-seeded short duration variety is grown.

The seed is sown in about November in the standing crop of late *aman* or late winter paddy crop, 15 to 20 days before it is harvested. The paddy crop is separated into rows every two feet, and the *sann* seed is sown along these rows. There is enough moisture in the soil to help the seed to sprout.

By the time paddy is harvested, the *sann* is six to eight inches high. The *sann*, if need be, is given one or two light irrigations. The crop flowers in January, starts fruiting in February. By mid-March, pods are ready for harvest. Thus it does not interfere with any food or money crop.

An average of five to six maunds of seed is obtained from an acre of *sann*, bringing the farmer an additional income of Rs. 75 to 100 per acre.

In coastal Andhra Pradesh, farmers also put a part of their *sann* crop, when in flower, to a very good use. They cut it and throw it into heaps all over the field. The *sann* gets wet with dew at night and dries up in the sun during the day. After a fortnight, they collect the *sann* and tie it into small bundles. Then they spread these over a half-built paddy straw stack, and cover it with paddy straw to make a full stack.

Due to pressure and heat, the *sann* leaves and stalks get fermented and form a sticky mass.

During summer, when grasses are not available, this silage forms a good fodder for the milch and work animals.

Sannhemp in pods



Photo by A.A. Johnson

A correction: In the article 'Have you a seed problem with *dhaincha*?' published in the March 1961 issue, the author's name should read G.V. Chalam and not C.V. Chalam.



Good Points

About

Aus Paddy

MANY farmers don't grow *aus* or autumn paddy (also known as *ahu* in Assam, *beali* in Orissa), in the belief that the crop gives poor yields.

This belief is not true. You can get as good a yield from *aus* as from *aman*.

Growing *aus* gives other benefits also. If you grow *aus*, you can take one more crop of paddy; if the rainfall in your area is not too heavy you can even raise a pulse crop in between. Whereas, *aman* keeps the land occupied for a long time, thus making it difficult to take any other crop on the same land.

For *aus* you need not grow the coarse rice varieties. The State Departments of Agriculture have fine varieties for you to choose from.

The autumn paddy also responds as much to good cultivation and manuring as does *aman*.

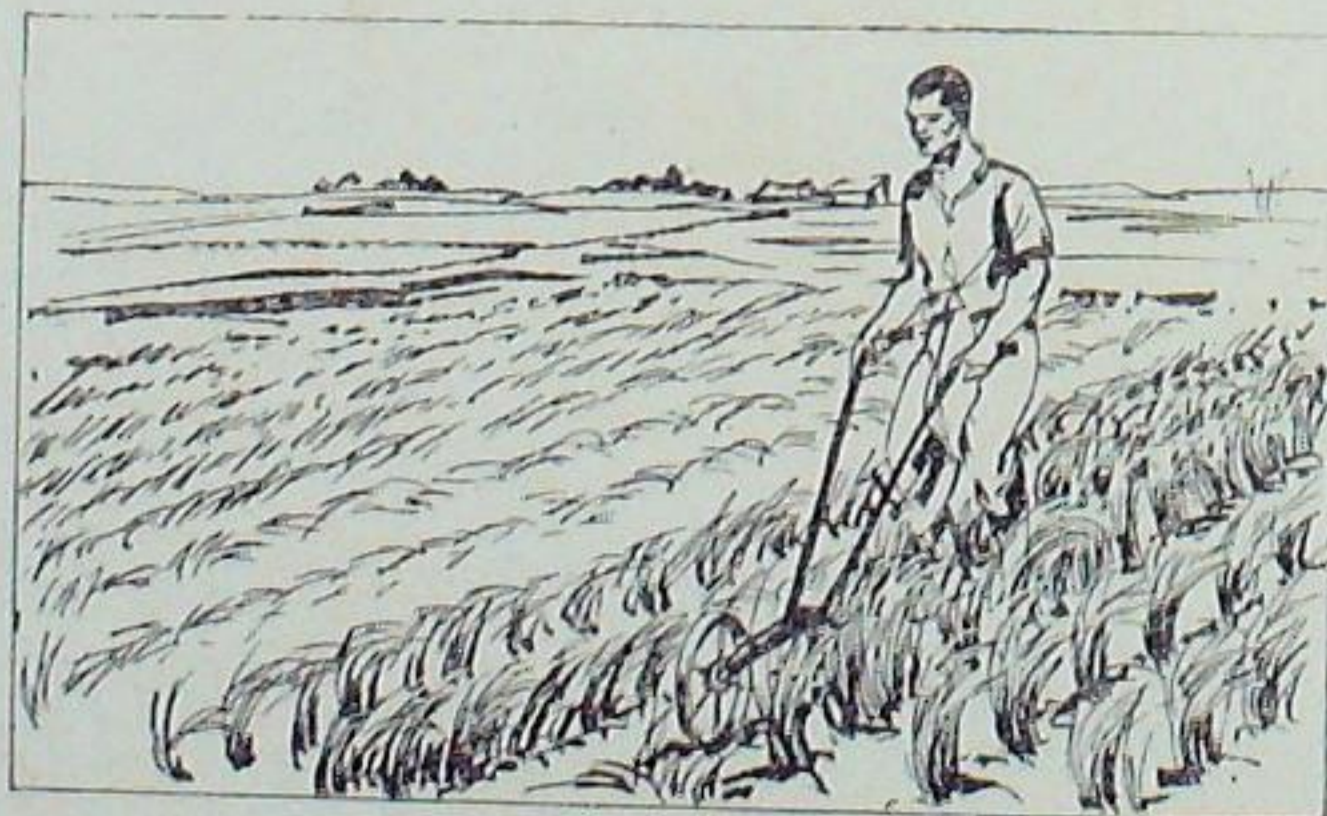
Hence, if you are in the upland rice area and have adequate irrigation facilities, you can grow *aus* with profit.

For *aus*, prepare your land well by repeated ploughings and ladderings. Spread

eight to ten tons of well-rotted cattle manure or compost and plough it in. You can use ten maunds of well-powdered groundnut cake instead.

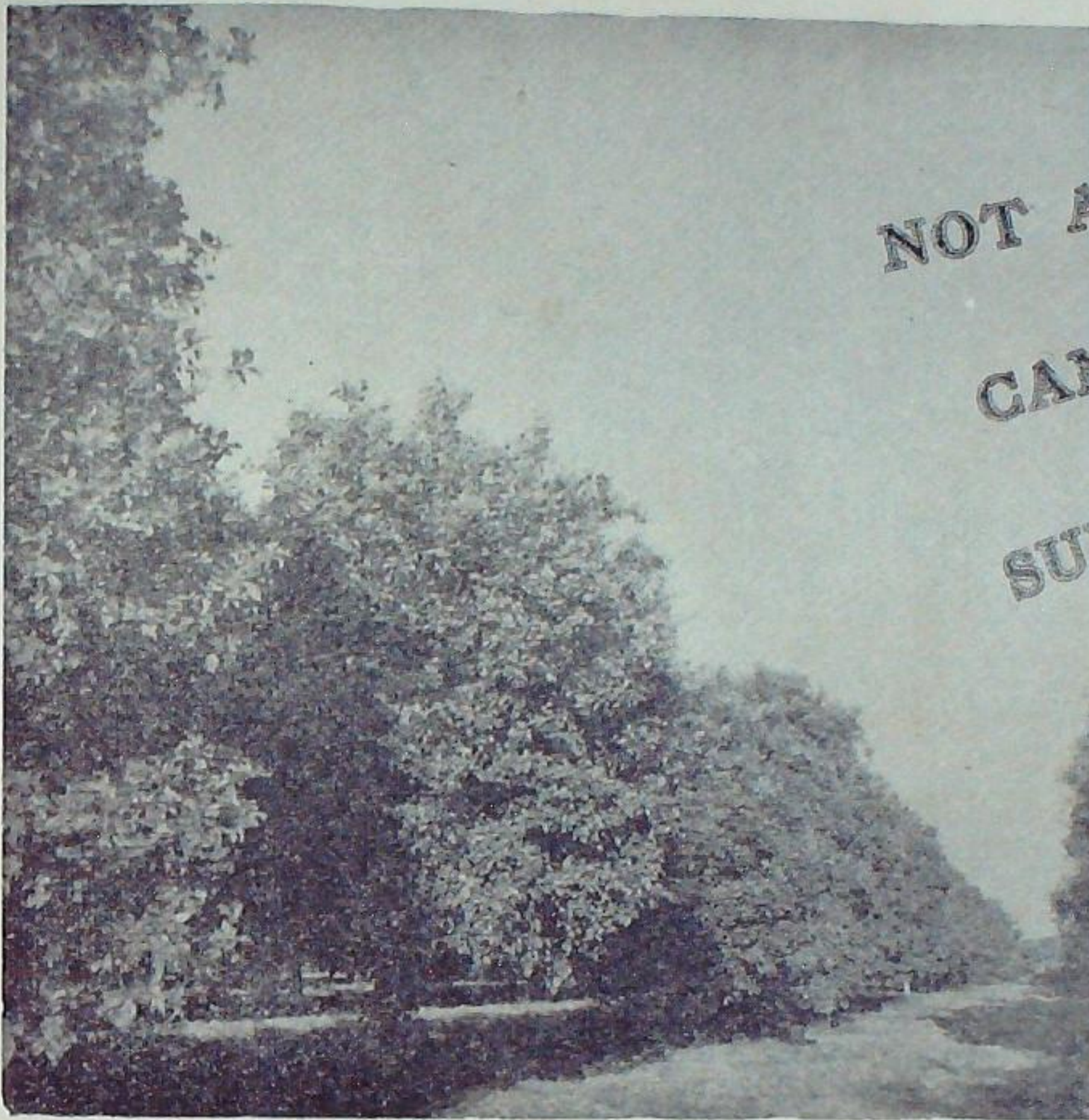
In addition, apply 20 pounds of phosphoric acid (as superphosphate) and 30 pounds of nitrogen (as ammonium sulphate) per acre. Apply the entire phosphate and half of the ammonium sulphate with the last ploughing. Give the rest of the ammonium sulphate after the first weeding.

Sow the seed in lines 12 inches apart in rows and thin the crop leaving a space of four inches between the seedlings in a line. The line-sown crop grows better and yields



well. It also makes interculture easy and cheap. You can as well grow cotton or a short-duration pulse crop along with paddy. Where possible transplant *aus*.

This time, give *aus* a chance.



**NOT ALL TREES
CAN FIGHT
SUN SCORCH**

**You have to protect
them with
some cover**

Summer is here with hot wind and severe sun. These are bad for your trees. They cannot stand the full blast of the summer sun, especially the young ones. Of course, this is not the case with all of them. Some can withstand the heat, while some are more sensitive to high temperature and may even die.

The parts of tree which are exposed to the direct sun get injured. The leaves get wrinkled and the bark gets dried up. Even the fruits get sun scorched.

The normal growth of the tree may also be checked. In banana, for instance, the fruit-stalk may become so weak that it will be unable to hold the heavy bunches.

Along with low humidity and high winds summer becomes more serious. Sun

burn is readily seen in widely spaced gardens, and the south-west side of the trees is more affected.

All these mean that you have to protect your trees well. Protection can be given in the form of shade or cover-up materials, wind-breaks, etc.

WRAPPING THE TREE TRUNKS

Use any wrapping material, even newspapers to wrap round the trunks of the trees. Cover the trunk from the ground to branches. Don't use too strong a string, so that these may decay in time. Or else, tight-tied strings may come in the way of their proper growth. If the string doesn't break in time, cut it off.

(more on page 24)

What To Do And How To Do It In **YOUR ORCHARD**

In May

HIMALAYAN TEMPERATE REGION

States : Parts of Assam, Kumaon Hills (Uttar Pradesh), Himachal Pradesh, Punjab Hills, Kulu Valley and Kashmir Valley.

You will be continuing to thin pome fruits like apple and pear, and stone fruits like plum, peach and apricot, taking care that the stone fruits are thinned before the hardening of the piths. You will be also harvesting early apricot varieties.

You should also :

Spray all hill fruits with lead arsenate-lime mixture and dust plants with sodium fluosilicate mixed with ash (1:8) to control the hairy caterpillar.

Bud the peaches by the 'Shield' or 'T' method. Commercial varieties are most successful on peach seedlings. Stock-seedlings of peach are best raised on light, deep and well-drained soils.

Clear weeds and remove all the runners in strawberry plantations.

NORTHERN DRY REGION

States : Plains of the Punjab, the western districts of Uttar Pradesh, western Madhya Pradesh and Rajasthan.

You will be digging pits for new fruit plantations to be planted in July-August.

You should also :

Provide protection to the young and delicate fruit trees against hot dry winds.

The bananas are good shade plants for litchi saplings



Protecting trees against the sun, hot winds and pests, and fertilizing and irrigating the orchard are the main things to look after in May



Grass thatching provides good protection to young plants against loo

Copiously water the orchard to prevent drying by the loo.

Fumigate mole rat holes with calcium cyanide. Apply 'Ferno' to get rid of weeds.

Mango

White-wash tree trunks of headed-back mango trees. Ring the budded mango shoots under the place of insertion after they have taken the buds, and lop the stock shoots at

By DALJIT SINGH

the ring where the buds have sprouted.

Citrus

Hand pick and destroy the larvae of the lemon butterfly. Control the citrus leaf minor by spraying with tobacco decoction (1 : 5).

Papaya

Earth up papaya plants after treating the soil with 2.5 per cent formalin solution to check collar-rot.

EASTERN WET REGION

States : Southern parts of Assam, West Bengal, Bihar, Orissa, eastern Madhya Pradesh, eastern Uttar Pradesh and north-east Andhra Pradesh.

You will be continuing the planting of banana suckers; starting the harvest of early varieties of mangoes; commencing the digging of pits for fresh plantations.

You should also :

Irrigate all fruit plants except citrus.

Dig around all the fruit trees.

Papaya

Sow papaya seeds in seed-beds. Hoe papaya plantations.

Citrus

Withhold water to get July flowering.

Destroy the citrus tree-borer by plugging holes with carbon disulphide.

Litchies

Continue irrigating litchies till the fruits ripen.

Guavas

Prune and manure guavas for inducing winter fruits.

SOUTHERN REGION

States : Southern districts of Madhya Pradesh, western Andhra Pradesh and Madras State, eastern parts of Mysore and Maharashtra States.

You will be continuing the harvesting of fully mature mangoes.

You should also fill pits with tank silt or red earth and cattle manure for new planting of fruit trees.

Citrus and Guava

Withhold water for a fortnight to citrus plants growing on heavy black soils.

Manure citrus and guava liberally with castor-cake, bonemeal and superphosphate.

Under the medium black soils of the Deccan, you can get good results from your citrus by manuring with 80 pounds of farmyard manure, 10 pounds of castor-cake and 2 pounds of superphosphate. Give a grown-up guava tree about 100 pounds of well-rotted farmyard manure per year.

Grapevines

Irrigate vineyards liberally and mulch the basins frequently to conserve moisture.

Paint the vine trunks with red colour or 'Gern' (red) earth to protect them against sun scorch.

Tie all new branches in parallel lines along bamboo poles or wires.



Properly earthed-up papaya plants will be safe from collar-rot

COASTAL REGION

States : Strips bordering the Eastern and Western Ghats, parts of Mysore, Madras and Kerala States.

You will be continuing harvesting mangoes and pineapples and completing the harvesting of cashewnuts.

You should also attend to :

Mangosteen

Irrigate trees periodically to get better fruit-set and fruit-development.

Breadfruit

Give a second interculture to the orchard.

Jackfruit

Attend to occasional watering and weeding of the trees.



A new crop that farmers will welcome

FARMERS on the West Coast have now added one more cash crop to those which they have already been growing. The crop is Sea Island (Andrews) cotton, popularly known as 'king cotton.'

The cotton has already been tested at research stations and also on farmers' fields in Kerala and Mysore, and has been found suitable for growing in hill paddy areas.

With Sea Island, farmers can now get a bigger income from their lands. They can raise this as a rainfed crop in rotation with hill paddy, ginger and sweet potato. If they have coconut gardens, they can grow it in-between trees, six to eight feet away from the trees.



King Cotton

claims the West Coast

This is how Sea Island cotton is grown.

PREPARE THE LAND WELL

Give four to six ploughings with the first monsoon showers. Spread cattle manure at six cartloads per acre and plough it in. Broadcast superphosphate at 200 pounds per acre and potassium sulphate at 100 pounds per acre. Cover with a light plough.

Make ridges 9 to 12 inches high. Space them at 2½ feet distance. Dig channels at every 40 feet to drain away excess of rain water.

SOW THE TREATED SEED

Treat the seed with organo-mercurial compounds like 'Agrosan GN' or 'Ceresan' about a week before sowing to get a disease-free crop. Store the treated seed in a dry place.

An ounce of the chemical is necessary to treat 28 pounds of seed. Use an earthen pot or a drum with a tight-fitting lid for the purpose. Fill 2/3rds of it with the seed and add the chemical. Tightly close the lid. Then rotate the container for three to six minutes to mix the two well.

Sow the seeds on the ridge. Dibble seeds a foot apart. Use three seeds in each hole.

THIN THE CROP

When the seedlings are about three weeks old, thin them out, keeping only one good seedling in each place. Fill up gaps with the pulled-out seedlings only.

MANURE THE CROP

Immediately after thinning, top-dress with 100 pounds of ammonium sulphate per acre. Loosen the soil three inches away from the base of the seedlings and apply the ammonium sulphate. Then cover it up with the soil.

Give the same dose of ammonium sulphate once again, when the plants begin to put forth flower buds.

KEEP DOWN PESTS

Keep the field clean of weeds.

Spray the crop with a copper fungicide in July, even if the crop does not show any disease signs.

Spray either Endrin or Folidol every fortnight, from June onwards to keep the crop free from pests and diseases. Endrin can be used for the first few sprayings; but Folidol must be used for the last spraying. Use one ounce of Endrin or half an ounce of Folidol in 6½ gallons of water. Be careful in using the chemicals as they are highly poisonous.

PICK CLEAN

Harvest only the mature bolls and pick them clean. One can easily get 1,000 pounds of cotton, this way.

Make Sea Island your next crop in the hill paddy areas.

(from page 19)

WHITE-WASHING

It is another way of protecting tree trunks from getting too hot. You can white-wash them by using this mixture:

Hydrated lime	50 pounds
Zinc sulphate	4 pounds
Water	100 pounds

SHADING YOUNG PLANTS

You can provide shade by putting up cover thatches over the plants or by building a mud wall around them. Young trees are best protected this way. Better still, grow some shade trees in your garden. Some grow *juntar* on the south-west side for the purpose. Instead you can grow quick-growing green manure plants also.

PROTECTING FRUITS

This you can do by covering them with paper or muslin bags. In bananas, cover the bunches along with the fruit-stalk with the dry leaves of the plant.

PUTTING UP WIND-BREAKS

There is nothing like putting up wind-breaks to prevent hot winds from doing damage. Select tall-growing trees as wind-breaks and plant them close in the western border or windward side of the garden. Trees with thick foliage make good wind-breaks.

As a rule, wind-breaks should be planted at the same time as orchards, and given a chance to grow rapidly. The height of all the trees should almost be the same.

In summer, you know the water escapes quickly. So don't forget to irrigate frequently and adequately.

The

SEWING KIT

you wanted



By DOLLY DAVID

AND IT WILL CARRY ALL
YOU NEED TO STITCH OR EMBROIDER

How often, when you wanted a thread or a needle or the thimble, you have searched for it, not found it, and said, "How I wish I could have them when I need them!"

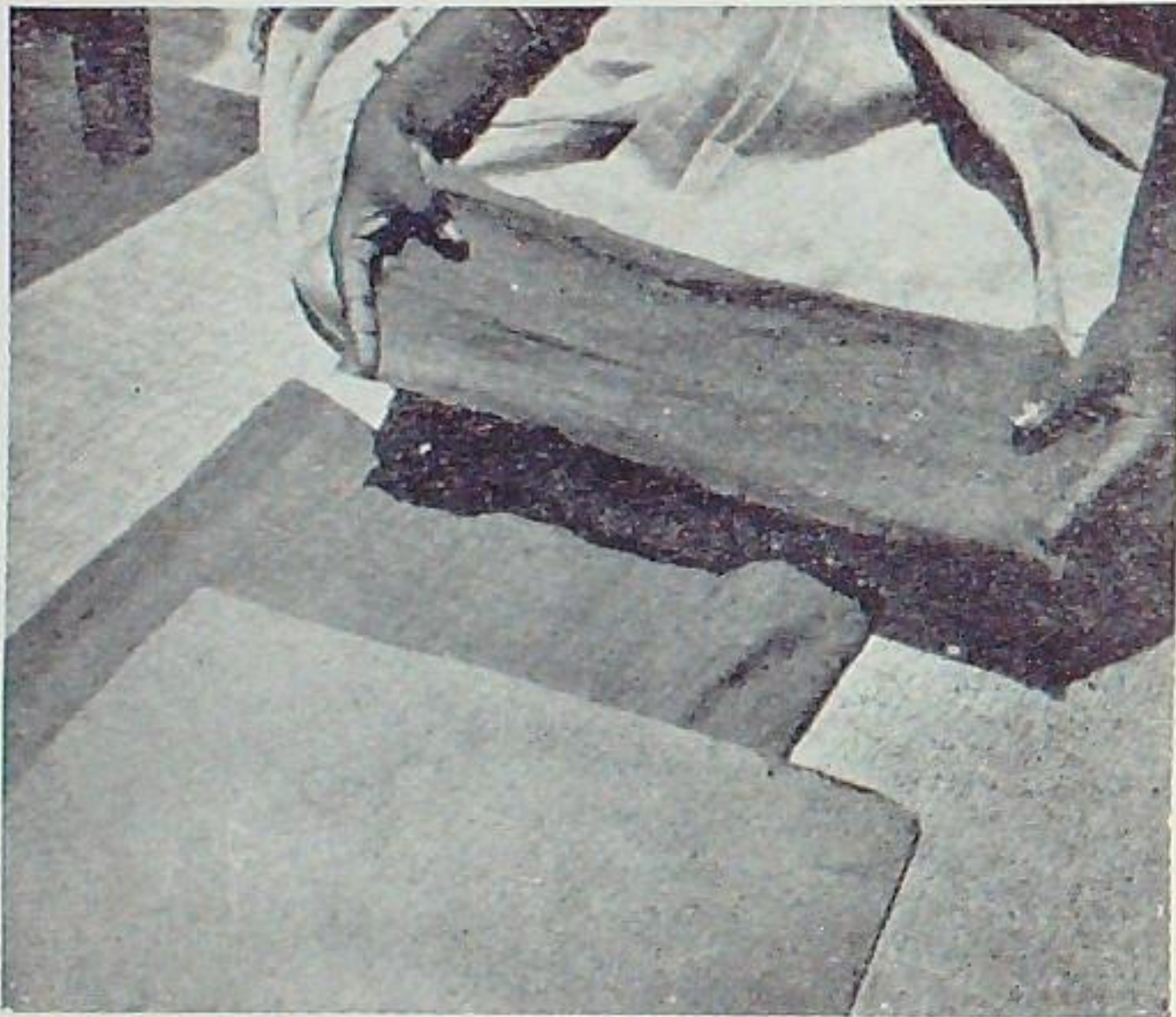
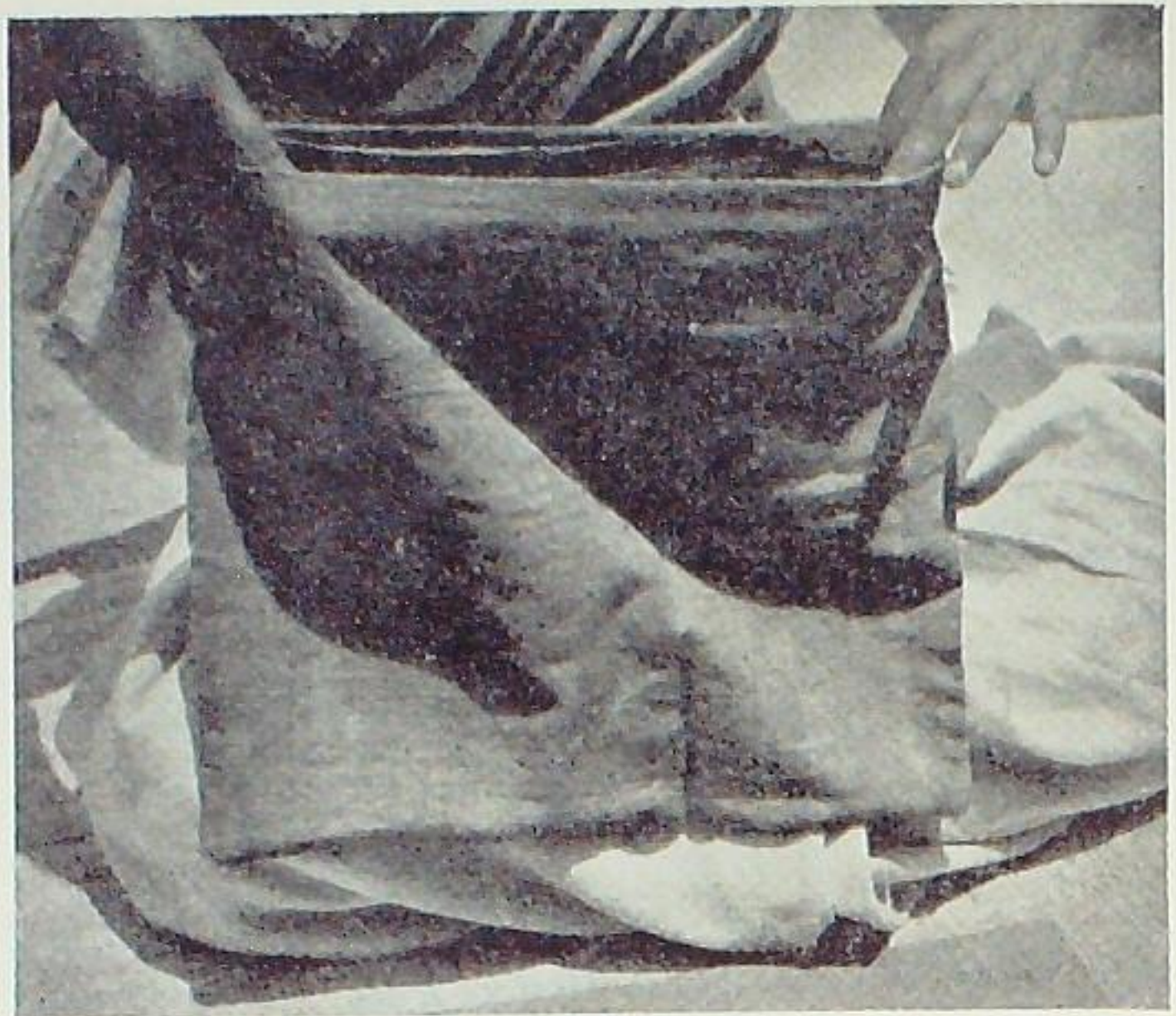
What you need is to keep them together and at one place, And a sewing kit is just meant for that. A thimble or thread, a pair of scissors or a scale, a pin or a pencil—all go in this bag, and the sewing book too! To make one will be a real fun. Here is how you start.

Take a thick cardboard 15 inches long and 18 inches wide.



Take a piece of cloth 31 inches long (including one inch for stitching) and $18\frac{1}{2}$ inches wide (half an inch for stitching).

Fold this lengthwise into two and join the sides together. Hem right round the open edge. This will make the two main pieces.

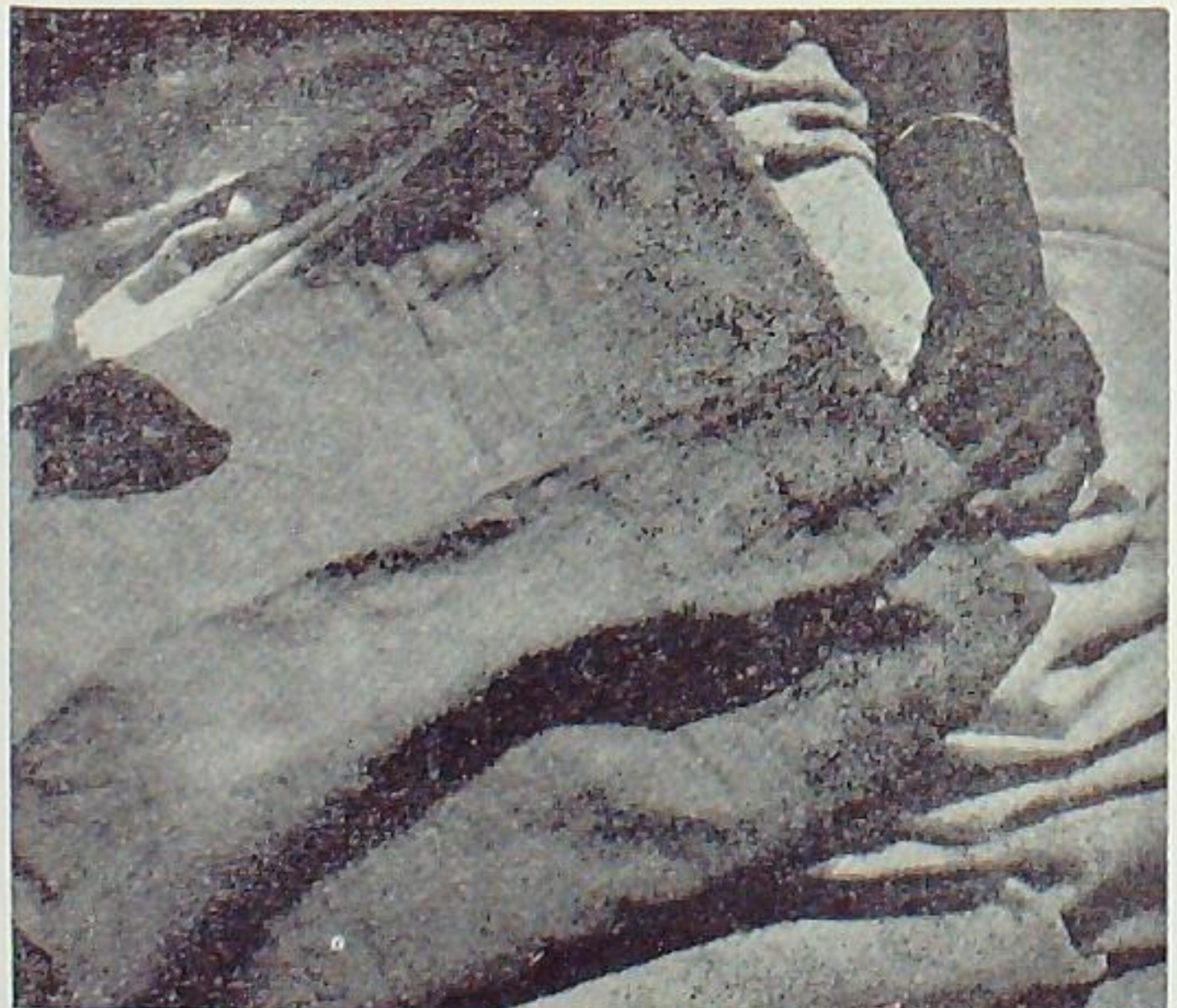


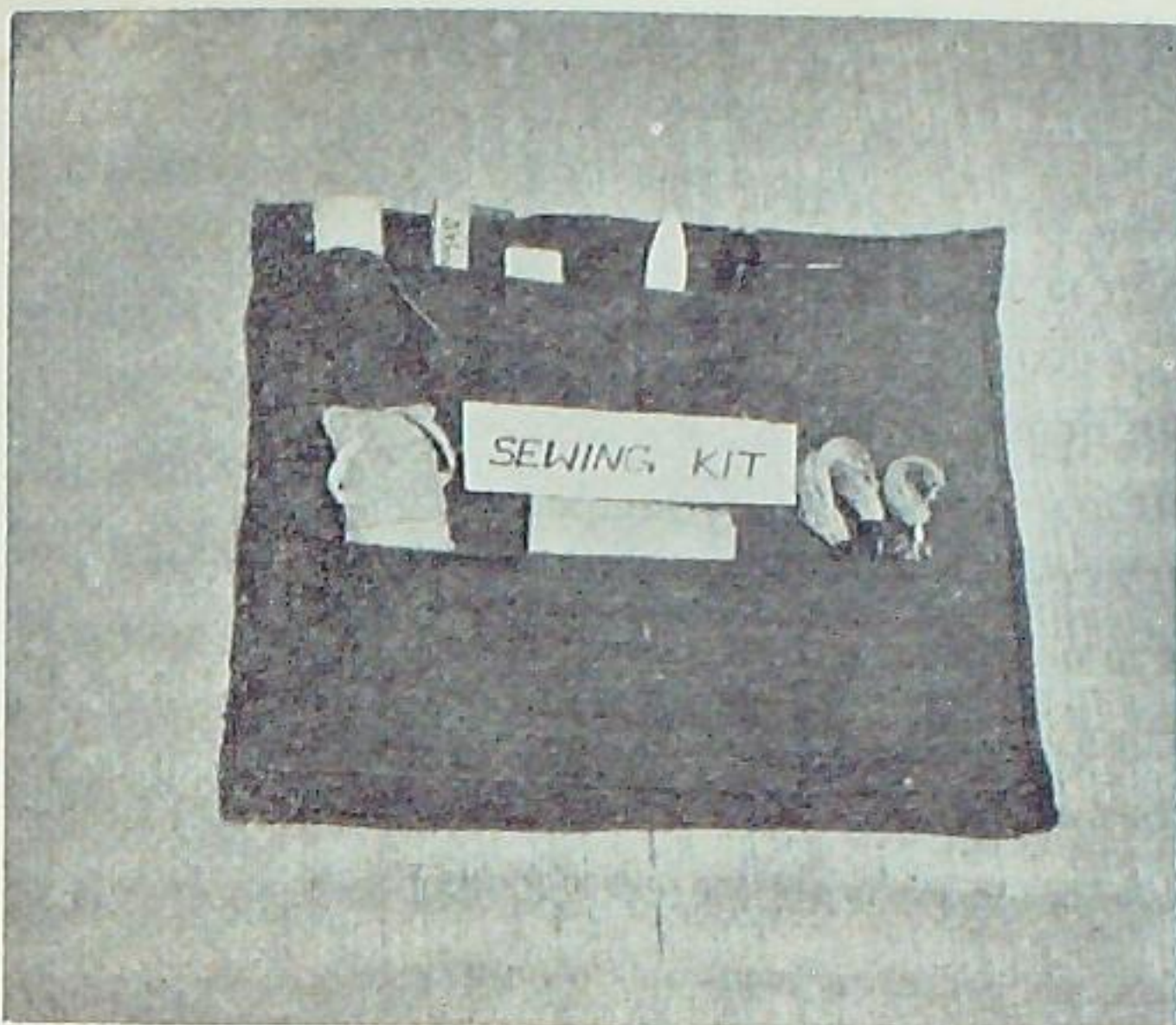
Take another two pieces of cloth, $18\frac{1}{2}$ inches wide and six inches long.

On the main piece, about one inch from the folded-edge at the bottom, attach one of the above two pieces. Do not pass the stitches right through the open bag. Similarly attach the second piece three inches below the top open end. Now there are two bag-like openings (pockets).



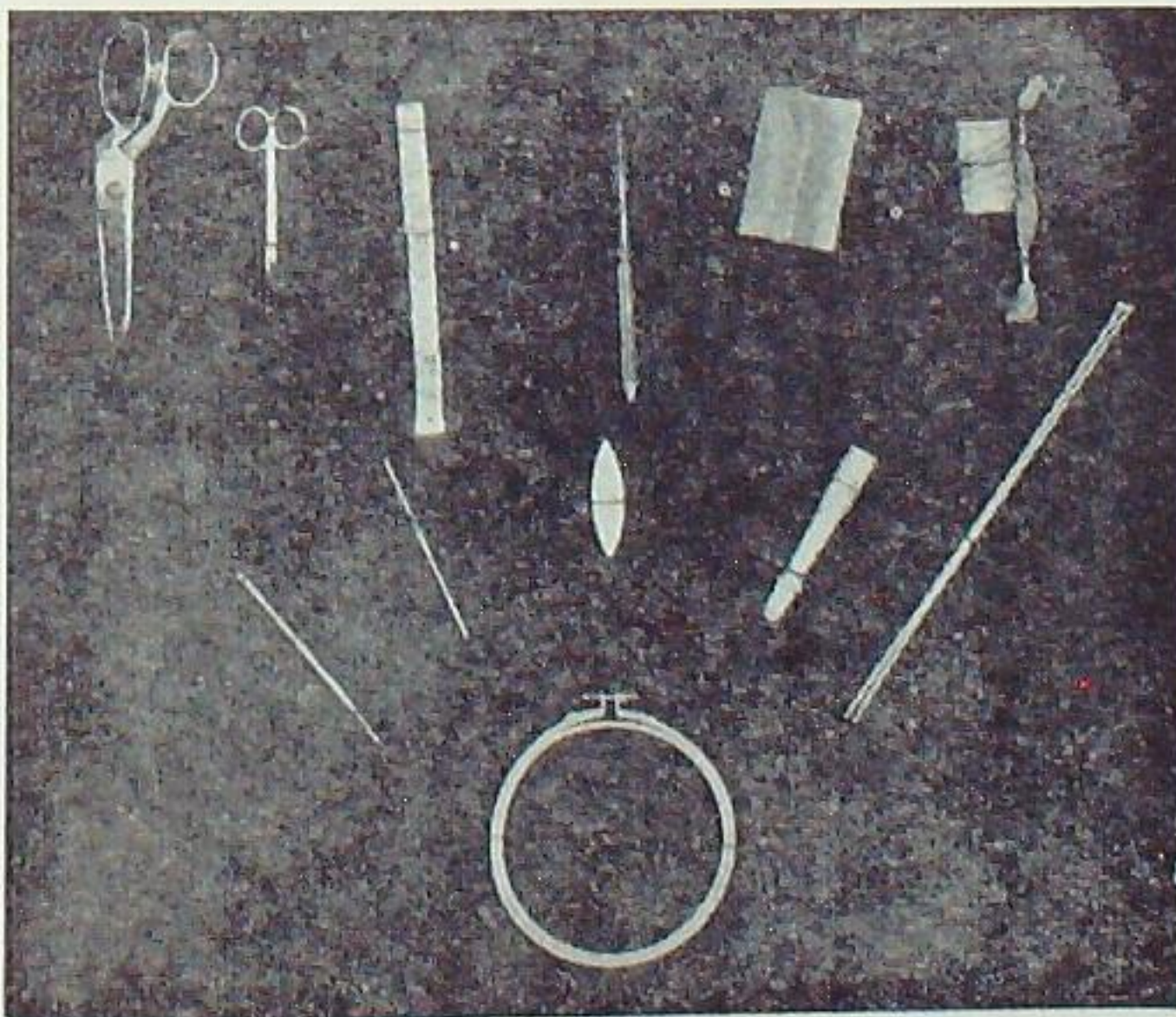
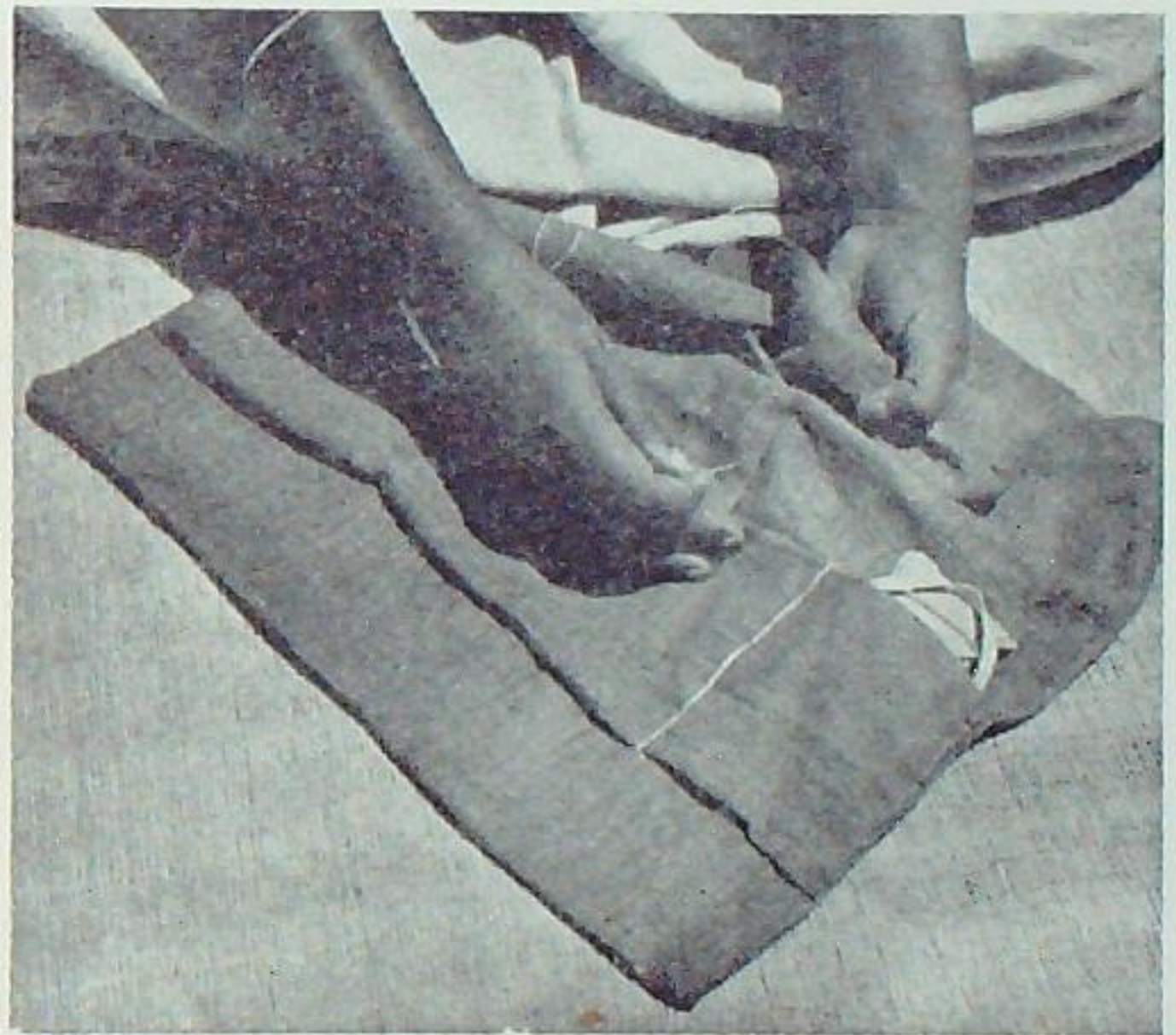
Divide the upper pocket into compartments of two-inch sizes. These are for placing a reel of thread, a needle-case, a tailoring-chalk, a pair of embroidery-scissors, etc.





Next, divide the lower pocket into compartments at greater intervals for placing bigger articles like a pin-cushion, the sewing book, etc.

Attach a piece of cloth $18\frac{1}{2}$ inches by 12 inches to the opposite side of the main piece, three inches below the top open-end.



Divide it into four compartments of ten inches, two inches, three inches and three inches each for placing an embroidery frame, a scale, a pair of scissors, etc.



Lastly, insert the cardboard in the opening of the two main pieces to make the kit firm.

The kit is now complete; it needs a cover though.

A shoulder bag can make a good cover. Placed in it, your sewing kit will remain safe and handy.

To make one you will need :

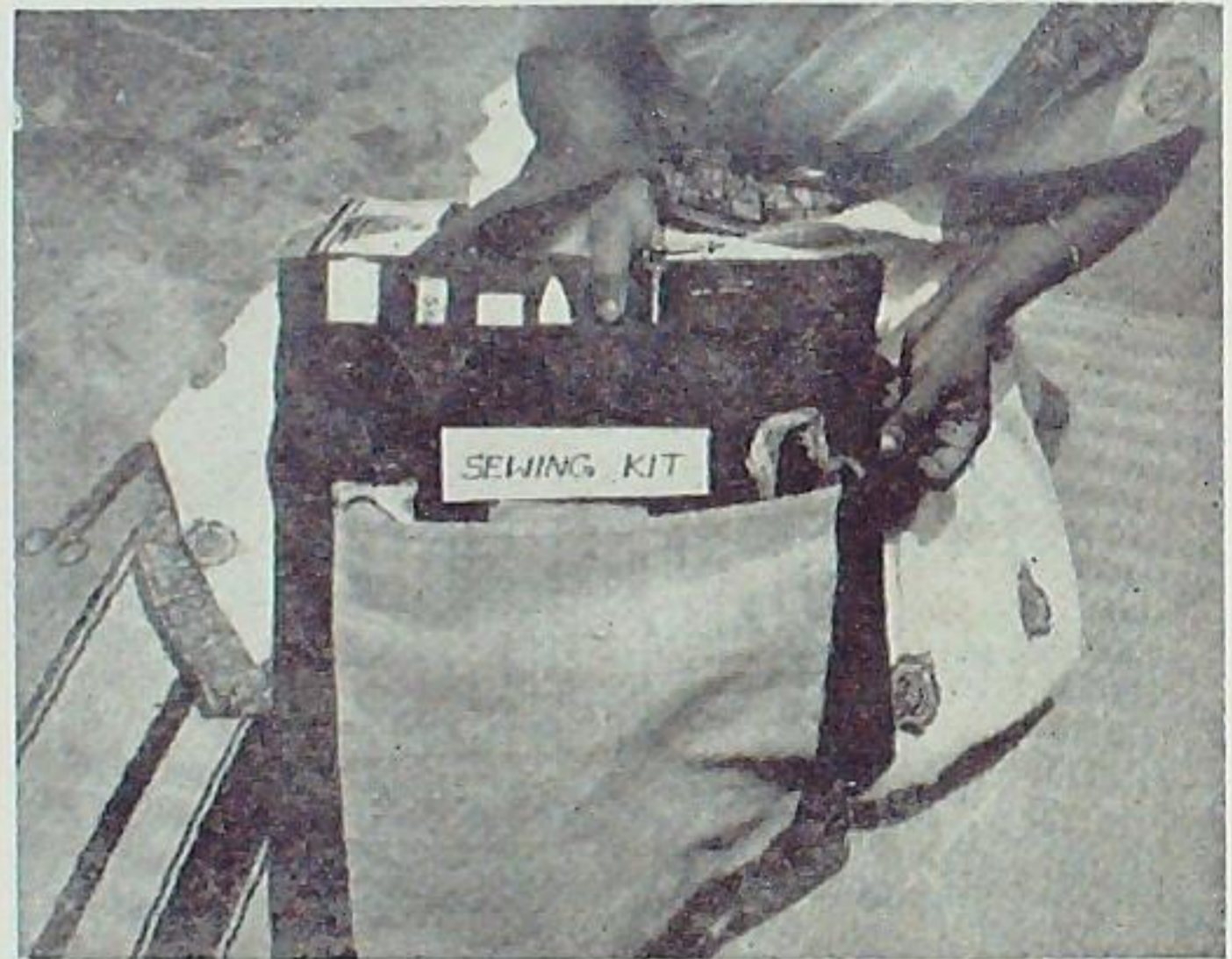
Two pieces of cloth of two different shades, preferably one dark and another light one.

The darker piece of 62 inches by 5 inches (four inches plus one inch for stitching) is for the border and handle.

Take another piece of cloth of lighter shade, 30 inches plus one inch in length, and width 16 inches plus one inch. Fold it lengthwise.

Attach this to the darker piece leaving two inches at each end of the border.

You can now hang it to a hook when not in use. But you know where to find it from when you start sewing.



The author gratefully acknowledges the "help" rendered by Miss Margaret Aaron, Assistant Instructor, Home Science Wing, Bhavanisagar, for arranging the demonstration on how to prepare a sewing kit.

OUR COVER PICTURE

With the threshing, many farmers find that it is time to rest. But many others are ready to follow with a pulse as a subsidiary crop in the dry season. Do you? If you have irrigation facilities you have a number of crops to choose from. Select a legume, if possible, because it will make your land fertile, and the next rice crop yield better.

—Photo by M.G. Kamath



USEFUL
BULLETINS
FOR
FARMERS

Tips on Better Farming	No. 3	50 nP.
" " "	No. 4	25 nP.
" " "	No. 5	50 nP.
Manures and Manuring		25 nP.
Rice Cultivation in India		50 nP.
The Mango in India		50 nP.
Oranges, Lemons and Limes in India		50 nP.
Feeding Goats for Milk Production		25 nP.
Our Leafy Vegetables		50 nP.
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Farm Implements You Should Have		25 nP.

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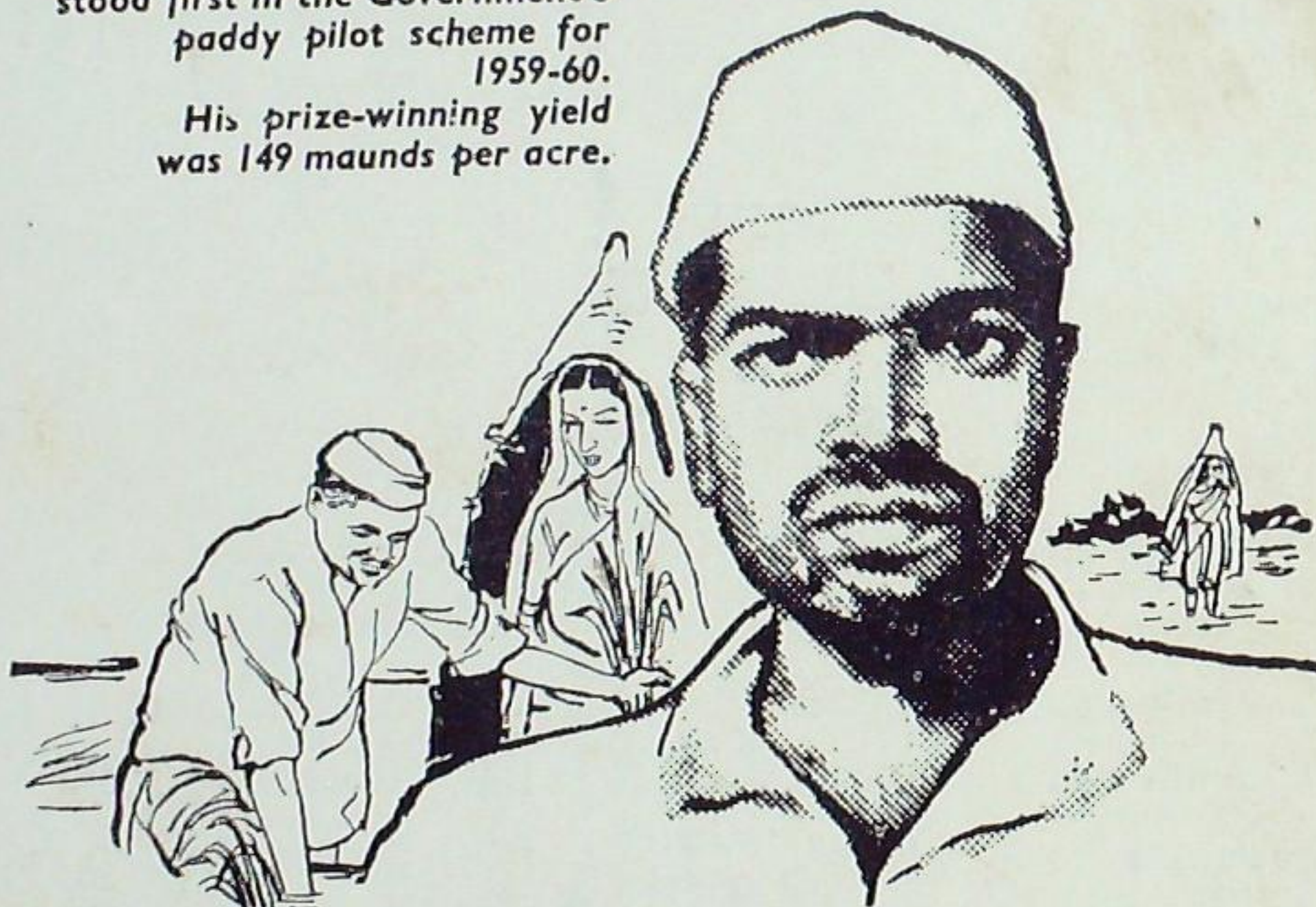
BUILDERS OF NEW INDIA

growing MORE FOOD for the nation

MEET THE WINNER!

*Sampatrao Hariba
Dhanawate of Mohat, North
Satara District, Maharashtra,
stood first in the Government's
paddy pilot scheme for
1959-60.*

*His prize-winning yield
was 149 maunds per acre.*



Secret of Sampatrao's success is adoption of improved agricultural practices—proper ploughing, sowing of better seeds, use of farm yard manure and fertilizers etc.

Enthusiastic and enterprising farmers like Sampatrao provide more food for the nation. They are helping to build a New India.

**THE PLAN MEANS
PLENTY AND SECURITY**
Work for it - Save for it