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groundnuts



BETTER FARMING SERIES

Twenty-six titles have been published in this series, designed as handbooks for a two-year intermediate level agricultural education and training course. They may be purchased as a set or as individual documents.

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1. The plant: the living plant; the root
2. The plant: the stem; the buds; the leaves
3. The plant: the flower
4. The soil: how the soil is made up
5. The soil: how to conserve the soil
6. The soil: how to improve the soil
7. Crop farming
8. Animal husbandry: feeding and care of animals
9. Animal husbandry: animal diseases; how animals reproduce

SECOND YEAR

10. The farm business survey
11. Cattle breeding
12. Sheep and goat breeding
13. Keeping chickens
14. Farming with animal power
15. Cereals
16. Roots and tubers
17. Groundnuts
18. Bananas
19. Market gardening
20. Upland rice
21. Wet paddy or swamp rice
22. Cocoa
23. Coffee
24. The oil palm
25. The rubber tree
26. The modern farm business

groundnuts

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PREFACE

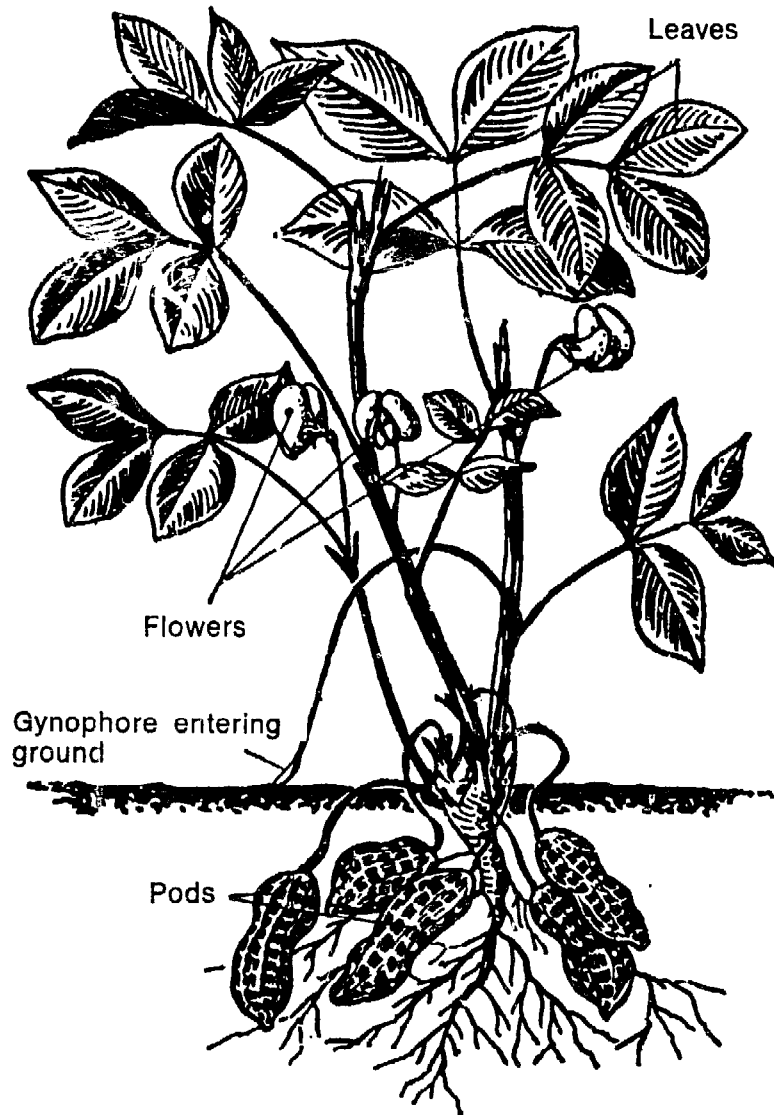
This manual is a translation and adaptation of "L'arachide," published by the Agri-Service-Afrique of the Institut africain pour le développement économique et social (INADES), and forms part of a series of 26 booklets. Grateful acknowledgement is made to the publishers for making available this text, which it is hoped will find widespread use at the intermediate level of agricultural education and training in English-speaking countries

It should be noted that the original texts were prepared for an African environment and this is naturally reflected in the English version. However, it is expected that many of the manuals of the series — a list of which will be found on the inside front cover — will also be of value for training in many other parts of the world. Adaptations can be made to the text where necessary owing to different climatic and ecological conditions.

Applications for permission to issue this manual in other languages are welcomed. Such applications should be addressed to: Director, Publications Division, Food and Agriculture Organization of the United Nations, Via delle Terme di Caracalla, 00100 Rome, Italy.

The author of this English version is Mr. A.J. Henderson, former Chief of the FAO Editorial Branch.

GROUNDNUT PLANT

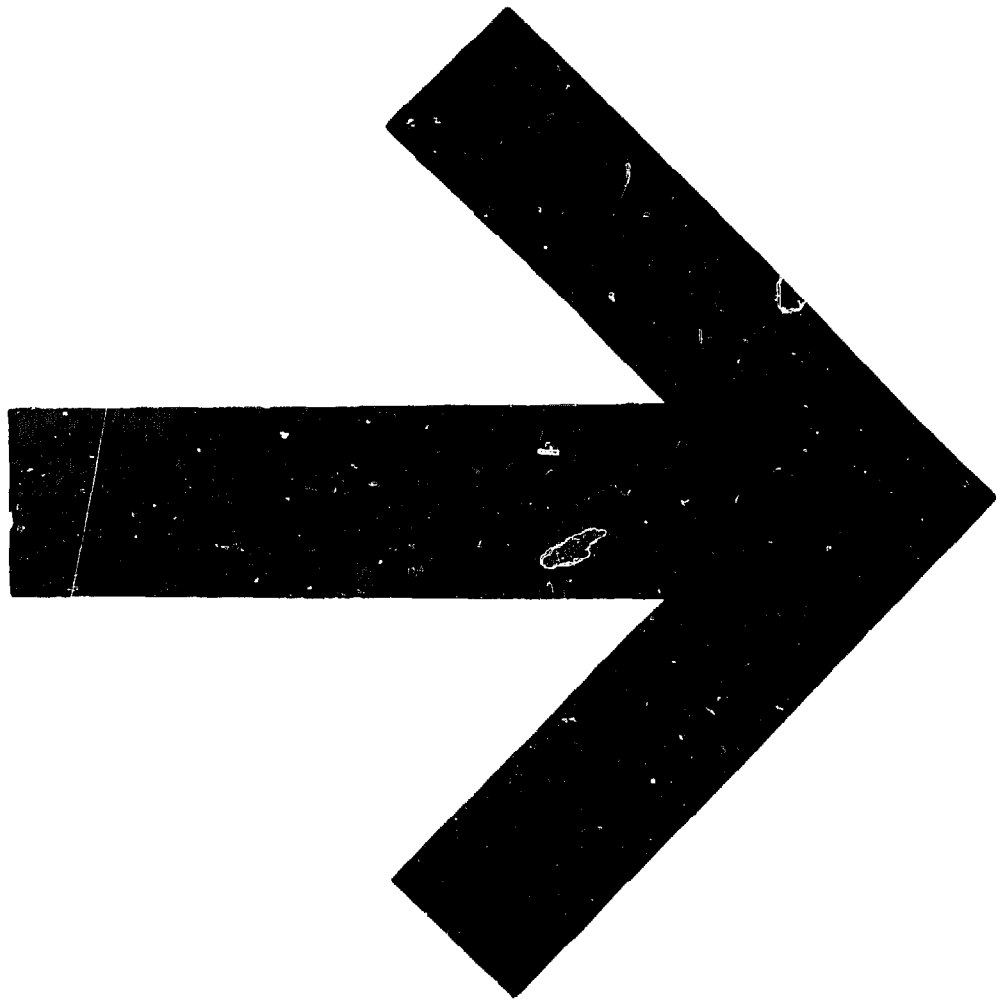


Pod



Shell

Seeds



OUTLINE OF COURSE

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WHY GROUNDNUTS ARE GROWN

Groundnuts are grown as a food for men and animals and also for sale.

1. As a food.

People eat groundnuts as fruit, or in the form of oil, or as paste, sauce or flour.

Groundnuts are a nourishing food.

They are rich; they contain certain substances necessary for human life. They contain 200 grammes of protein per kilogramme.

Millet, sorghum, sweet potatoes, yams and cassava all contain less protein than groundnuts.

Oil is made from groundnuts. This oil is much used in cooking.

100 kilogrammes of shelled groundnuts may yield 40 to 60 kilogrammes of oil.

2. As animal feed.

After the oil has been taken from groundnuts, **oil cake** is left.

Oil cake is a very nourishing food for animals.

SELLING GROUNDNUTS AND EARNING MONEY

- 3. Groundnuts bring in money for families and workers.**
The farmers sell their crop on the market, or to cooperatives, or to business companies.
The cooperatives and companies turn the groundnuts into oil.
The oil mills in the country, make a livelihood for the workers.

- 4. Groundnuts bring money into the country.**

Often the country resells the groundnuts abroad.
Groundnuts can be sold shelled or in the form of oil.

The money paid by foreign countries for groundnuts or groundnut oil helps the government to build schools and roads, to buy manufactured goods (machines, fertilizers, clothes), and pay government officials.

- 5. The price of groundnuts is rather low in all countries.**

Groundnuts do not fetch a very high price. The farmer who wants to earn money must produce more on his land; he must increase the yield.

Even if the price of groundnuts is not high, the farmer who produces 1 000 kilogrammes of groundnuts will earn more than the farmer who produces only 300 kilogrammes.

In order to increase the groundnut yield, the farmer must prepare his fields very well and carefully follow the advice of the extension worker.

In this way he will get good-quality groundnuts, sold at a better price, and he will have more groundnuts.

CHOOSING SEEDS

The seeds (the nuts you sow) must be good, disinfected, and from selected varieties.

HOW TO CHOOSE GOOD SEEDS

6. When you separate the seeds from the pods, that is when you shell the nuts, throw away any seeds spoiled by insects or disease, and any misshapen seeds.

A misshapen seed will not grow well.

If the germ of a seed has been eaten by an insect, the seed will not germinate.

Shell the nuts only a few days before sowing, otherwise the seeds will be dry. Seeds must not be dry before you sow them.

DISINFECTING SEEDS

7. **Mix the disinfectant thoroughly with the seeds, so that it covers them all.** Disinfectant protects seeds against moulds and insects.

The disinfectant is sold by the extension services. It is usual to mix one small tomato tin full of disinfectant with 1 cask full of shelled nuts - this means mixing 2 grammes of disinfectant for use with 1 kilogramme of seeds.

8. Disinfectant is poisonous.

Be very careful in using it

Wash your hands well after touching disinfectant.

Never give disinfected seeds to animals.

Never leave disinfectant where children can get at it.

9. Disinfected seeds are not eaten by insects.

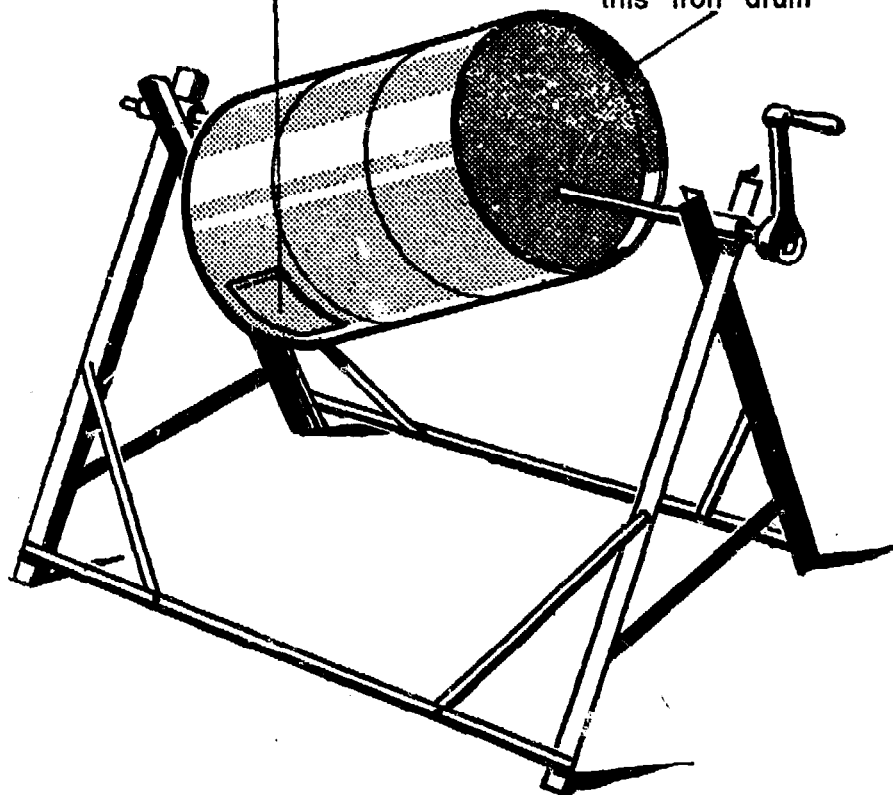
Disinfected seeds do not rot.

All the seeds will grow, there will be very few plants missing.

Disinfection makes for good density, and so the yield is better.

Door for filling and emptying the drum

Seeds are put in this iron drum



Device for disinfecting seeds

USING SELECTED SEEDS

10. It is not enough to choose good seeds and to disinfect them.

If you want a very good harvest, **you must also use seeds from selected varieties.**

Ask the extension services for selected seeds, for the best varieties.

Seeds from selected varieties produce better groundnuts:

groundnuts that contain more protein, and are therefore more nourishing;

groundnuts that contain more oil, and are therefore better for the oil mills.

Selected varieties resist disease better.

In the humid regions, for example, certain varieties are resistant to rosette.

Selected varieties are more adaptable to climate.

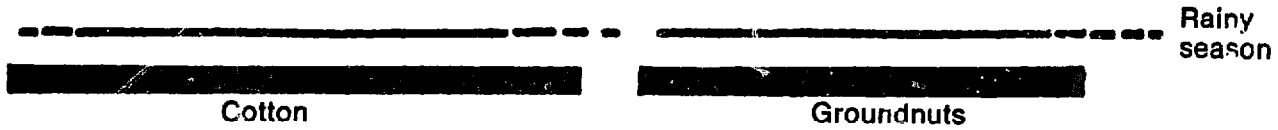
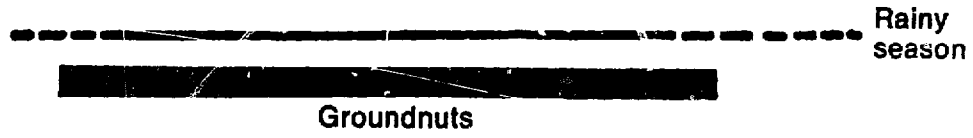
Some varieties ripen in 3 months; others in 5 months.

11. If the rainy season is long, it is best to sow groundnuts that ripen in 5 months, **long-season groundnuts.**

If the rainy season is short, it is best to sow groundnuts that ripen in 3 months, **short-season groundnuts.**

In places where there are two rainy seasons, it is possible to grow two crops a year - for instance, a groundnut crop first and then a cotton crop. (See diagram on following page.)

February January December November October September August July June May April March



HOW TO KNOW WHETHER SEEDS ARE GOOD

Make an experiment before sowing.

12. Put 100 seeds into damp sand. To keep the sand damp, cover it with a wet cloth or wet straw. After 6 days, the seeds have germinated.

● **Count how many seeds have germinated.**

If 90 seeds have germinated, the seeds are good. The germination rate is 90 out of 100 (90 percent). This is a good germination rate.

If 40 seeds have germinated, the seeds are less good. The germination rate is 40 out of 100 (40 percent). This is a poor germination rate.

In making this experiment you have made a germination test.

13. For a field of good density, you must sow seeds which will give you more than 85 percent of plants (85 plants growing for every 100 seeds you sow). These seeds have a good germination rate.

If you have worked your field well and if it rains at the right moment, there will be few plants missing.

CHOOSING THE LAND

Groundnuts can grow on savanna or forest land. They do not need a very rich soil. But the harvest will be better if you choose a **light soil, which is well aerated and not too damp.**

14. Groundnuts grow better in light soil.

The fruits of the groundnut plant, **the pods,** develop underground.

They have to penetrate the soil in order to develop. The pods cannot easily penetrate into the soil if the soil is too heavy; that is, soil that sticks to the hands during the rainy season and during the dry season forms clods which are hard to break up.

In light soil, which is a mixture of sand and clay, the pods can develop easily. There will be more nuts, and they will be bigger.

It will also be easier to lift them at harvest time, so that none will be left in the ground.

15. Groundnuts grow better in aerated soil.

The fruits need to breathe in order to ripen. They cannot grow big when the soil is not well aerated.

The soil must be well worked before and after sowing, so that air gets into the soil everywhere. The soil is easy to work well if it consists of sand and clay (sandy clay soil).

16. Groundnuts grow better in aerated soil that is not too damp.

Groundnuts need water in order to form and develop their pods and nuts. But if there is too much water in the soil the fruits may rot.

The water needs to circulate in the soil. Water circulates well in sandy clay soil.



Water sinks slowly
in clay soil

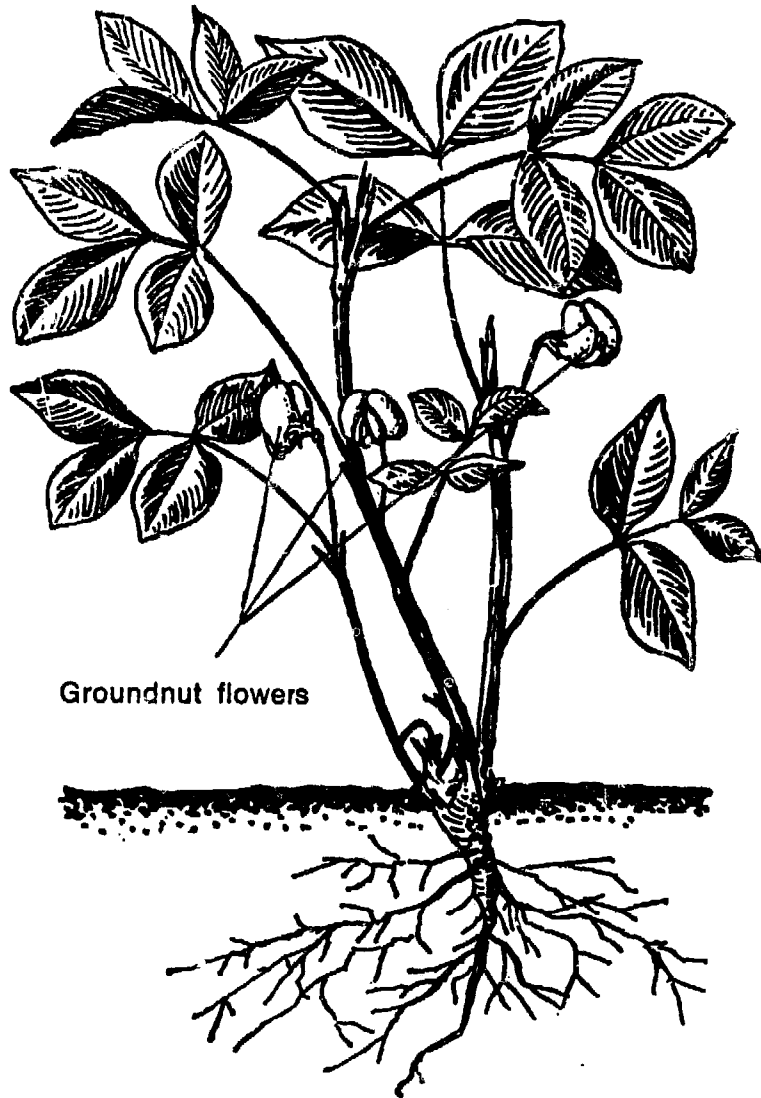


Water sinks quickly
in sandy clay soil

17. Why do groundnuts grow better in a light, aerated soil?

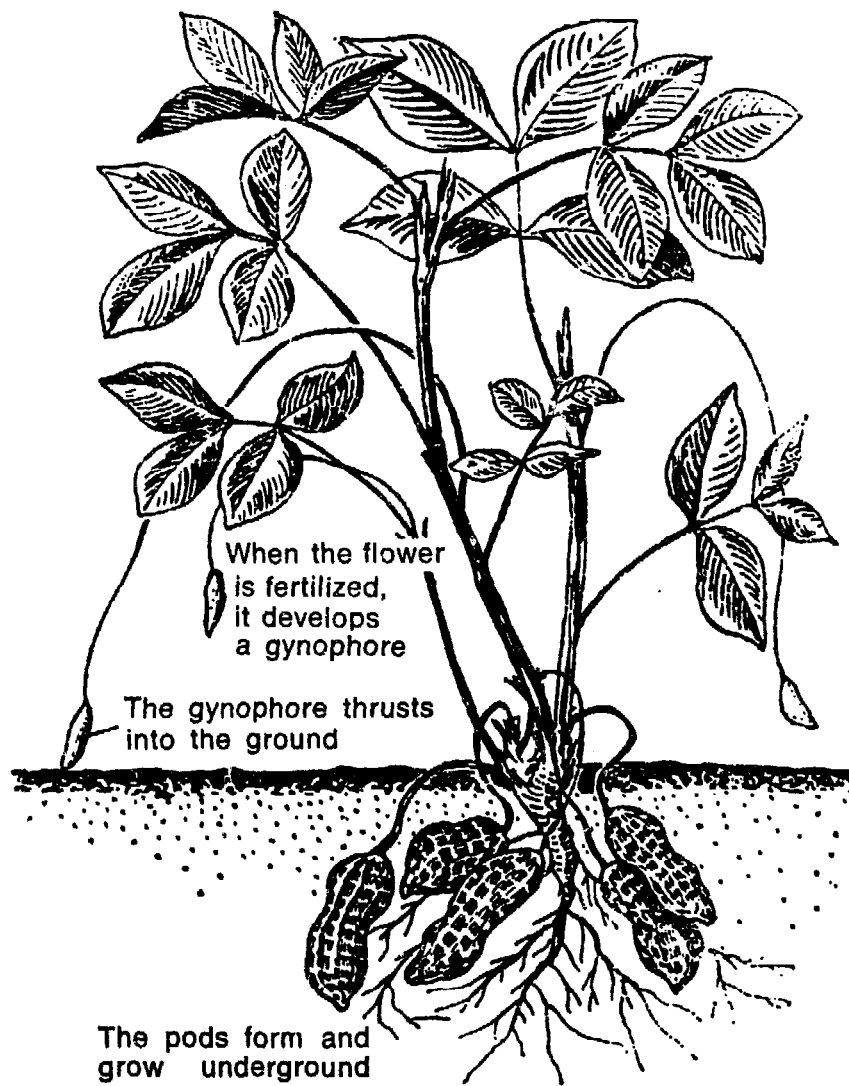
The reason is that the fruits grow in the earth.
Fruiting takes place underground.

Flowering



A groundnut plant in flower

The flowers when fertilized develop gynophores.
The gynophores penetrate the ground and the pods
and nuts develop from them.



MARKING OUT THE BOUNDARIES OF THE FIELD

18. You must mark out the boundaries of the field before you start preparing it.

You will need to know how to measure your field. For this your field will need to be either square or rectangular. That is, its corners must be right angles.

How can you make a right angle?

Put a stake at O in the diagram.

Tie a string to the stake and extend it along the line OB until the free end is 3 metres from the stake.

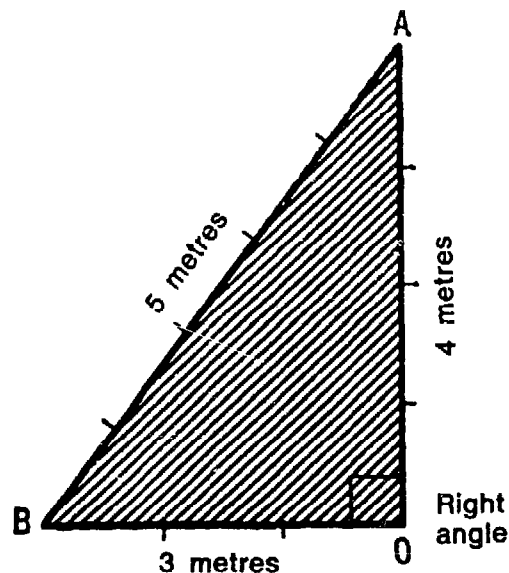
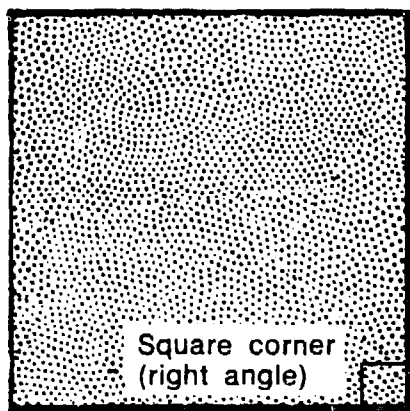
Do the same thing with a string from O to A, and make that distance 4 metres.

Move the ends of the strings at A and B until they are just 5 metres apart.

Now the angle at O is a right angle.

Why make a field with right-angled corners?

- It is easy to calculate the area of such a field.
- You will be a modern farmer who knows:
 - how many groundnut plants you should have on this field;
 - how much fertilizer you should apply;
 - whether the field yields a good or poor harvest.You need to know the area of the field in order to make these calculations.



HOW TO CALCULATE THE AREA OF A FIELD

19. To calculate the area of a field with right angles at the corners, multiply the length by the width of the field.

Example: a field is 100 metres long and 100 metres wide;

its area is $100 \times 100 = 10\,000$ square metres (m^2).

A square metre is a square measuring 1 metre in length and 1 metre in width.

One hectare = $10\,000 \text{ m}^2$.

Example: a field is 200 metres long and 50 metres wide; its surface is $200 \times 50 = 10\,000 \text{ m}^2$.

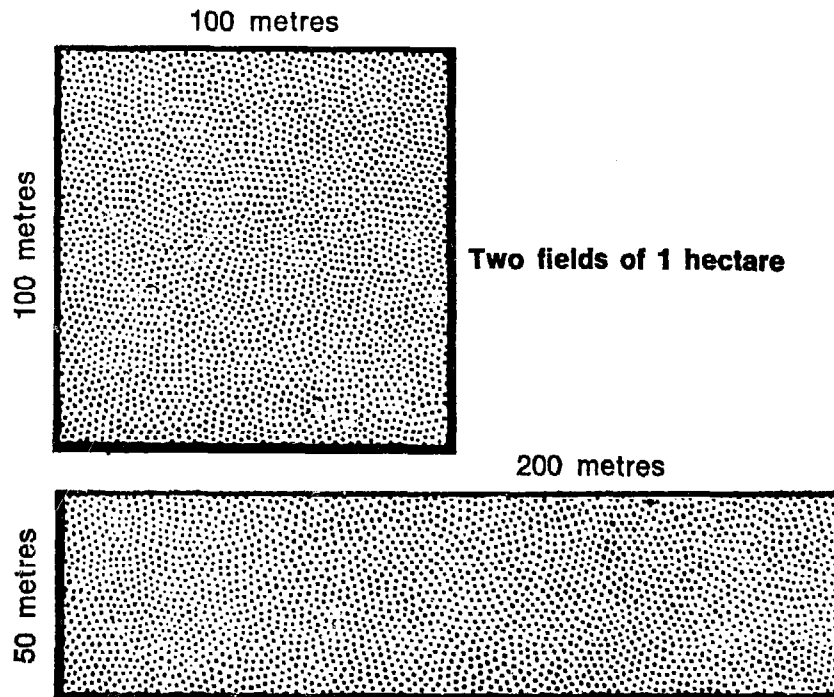
It is also 1 hectare.

A field which is 71 metres long and 71 metres wide, has an area of $71 \times 71 = 5\,041 \text{ m}^2$.

A field which is 100 metres long and 50 metres wide, has an area of $100 \times 50 = 5\,000 \text{ m}^2$.

These are both fields of half a hectare.

Before you put your stakes along the boundary of the field, you must ask permission to cultivate the field according to the local laws and customs.



TILLING

- 20.** Before sowing groundnuts, you must prepare the soil, that is, **till** it.

WHY TILL THE SOIL BEFORE SOWING?

Tilling 15 to 20 centimetres deep will stir the soil very well.

Do this work with the hoe or the plough.

Tilling loosens the soil; it gets air and water well into the soil.

Tilling enables you to mix the herbage with the soil. When the herbage rots, it makes humus. Where the herbage is too big, cut it, pile it up and burn it before tilling; and then you must spread the ashes all over the soil.

In a soil well loosened by tilling, the water penetrates well and stays for a long time.

Therefore, till at the beginning of the rainy season, so that the soil holds the water.

This first tilling is very important; do it just as soon as you can move the soil.

- 21.** Tilling, or turning the soil over, can be done with the hoe, the spade or the digging fork.

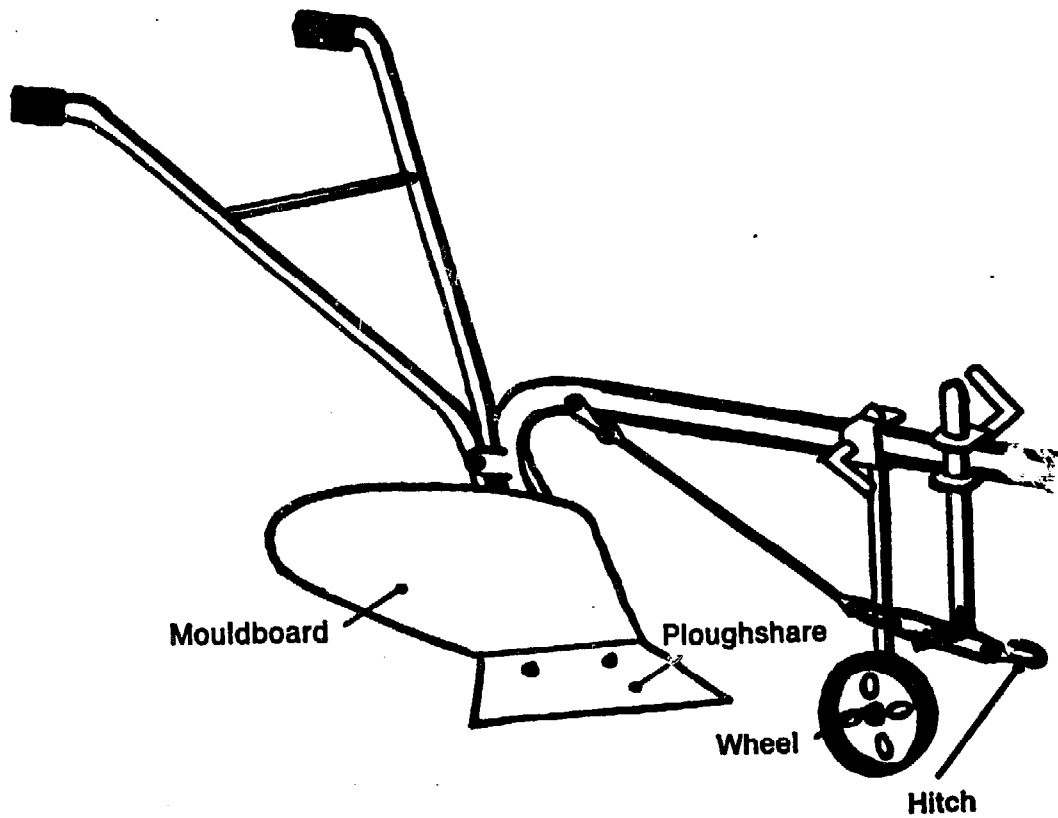
But this is slow and tiring work.

Nowadays, people use a plough drawn by donkeys or oxen. The work is done better and more quickly.

The plough

Most often, people use a simple plough.
The plough consists of a ploughshare, a mouldboard and two handles.

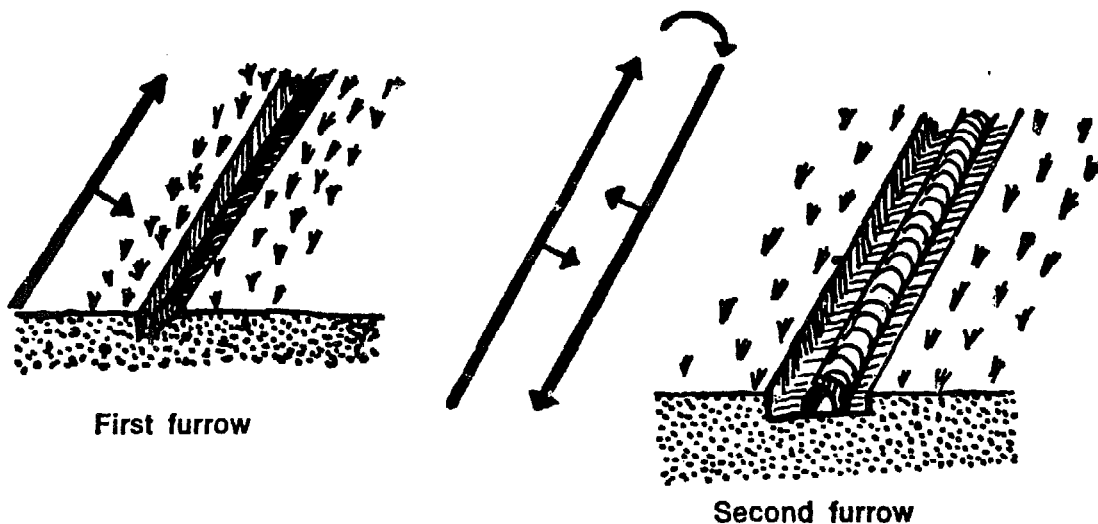
Handles for holding the plough



The plough

HOW TO PLOUGH

22. Make a first furrow with the plough across the whole length of the field.

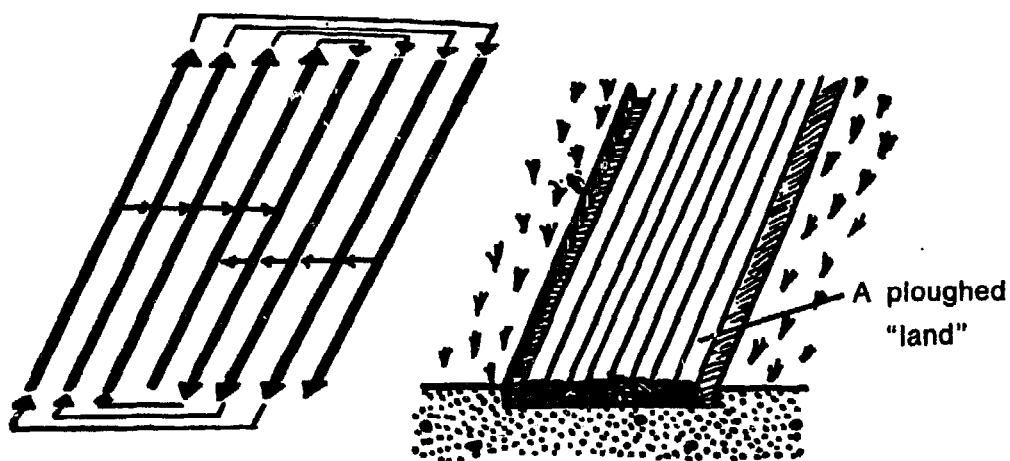


At the end of the field, turn.

Make a second furrow alongside the first. The second strip of ploughed field joins the first.

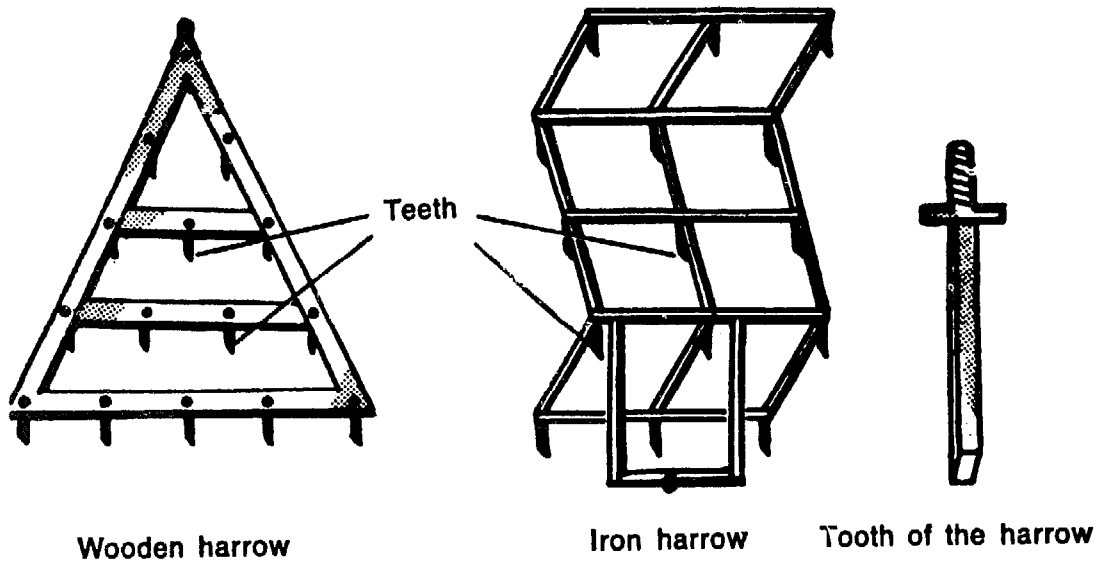
After that, keep turning around the double strip of ploughed field. This is conventional ploughing. If the field is very long, you have to turn less often; ploughing is quicker.

Now the field is well ploughed.

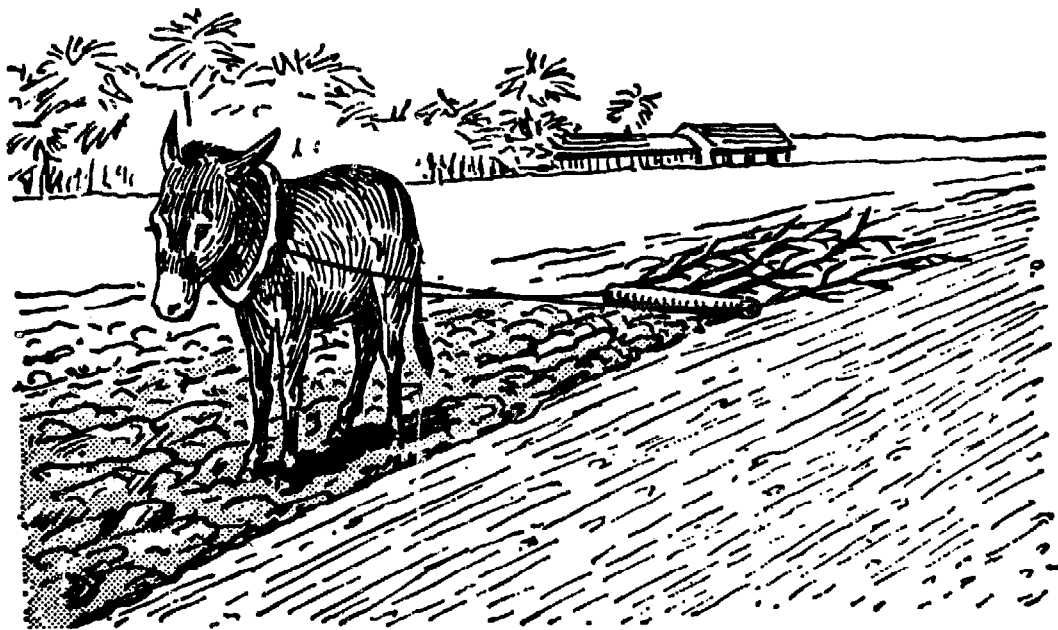


Conventional ploughing

23. Ploughing often does not leave the soil flat. There are clods of earth. These clods of earth are broken up with a harrow.



If you do not have a harrow, you can let an animal draw big branches over the field to crush the clods.



SOWING

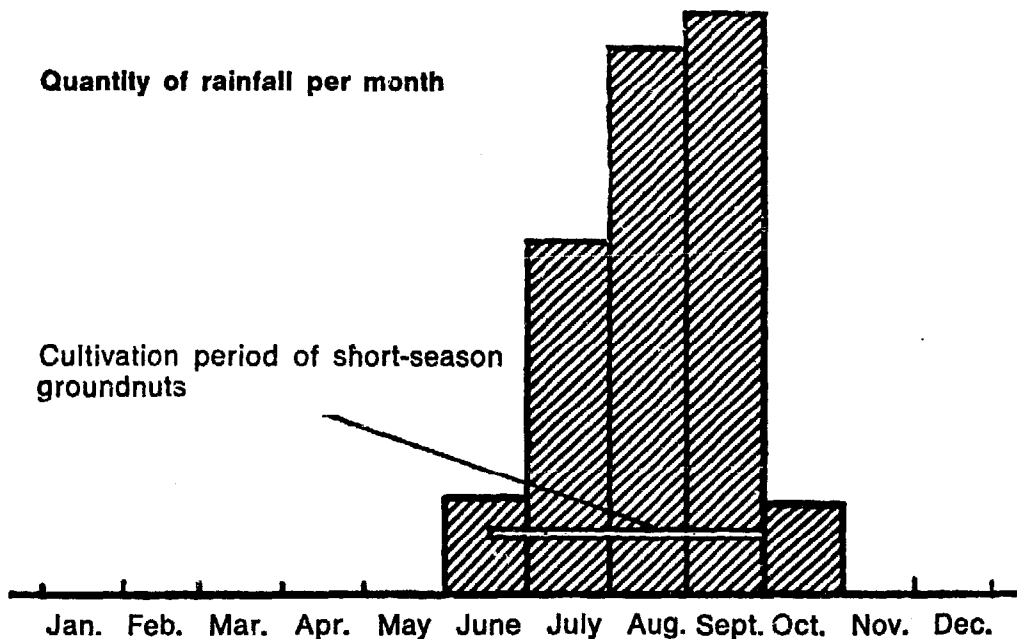
WHEN TO SOW

24. The right time for sowing is when the soil has been well prepared and is fairly damp.
Sow 30 to 40 days before the heaviest rains.
Like that, the heavy rains will come when the plant is flowering and forming its fruits; that is, when the plant most needs water.
When the fruits are ripe, it rains less and so the pods do not rot.
Choose either short-season or long-season varieties of groundnuts according to the length of the rainy season in your area.

Examples:

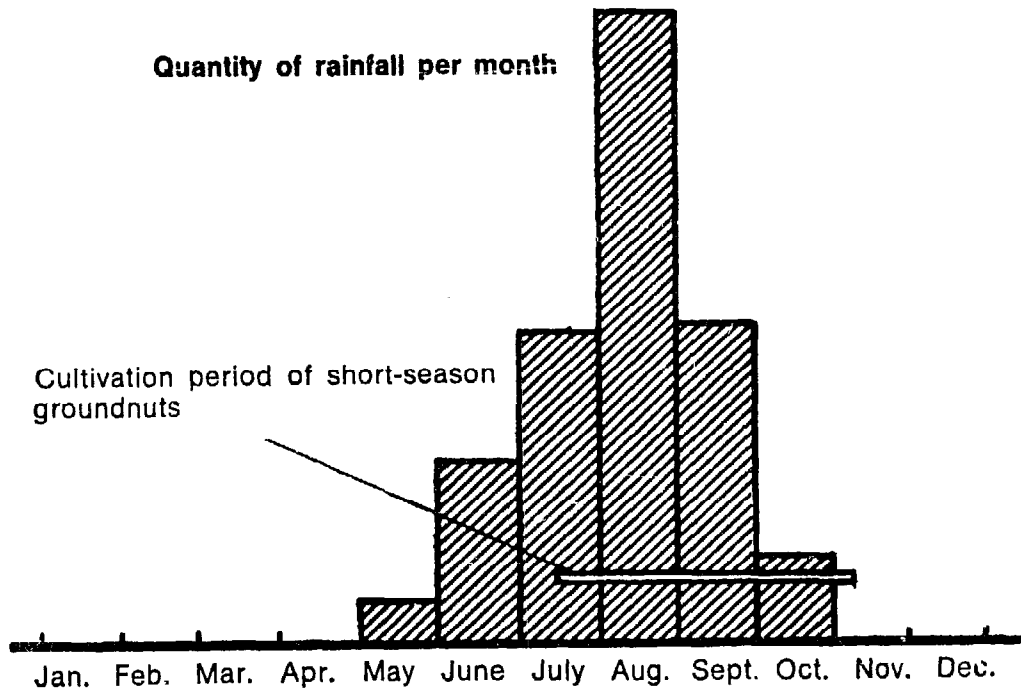
- **Senegal, Tivaouane region**

The rainy season is **short**: it is best to sow **short-season** groundnuts.



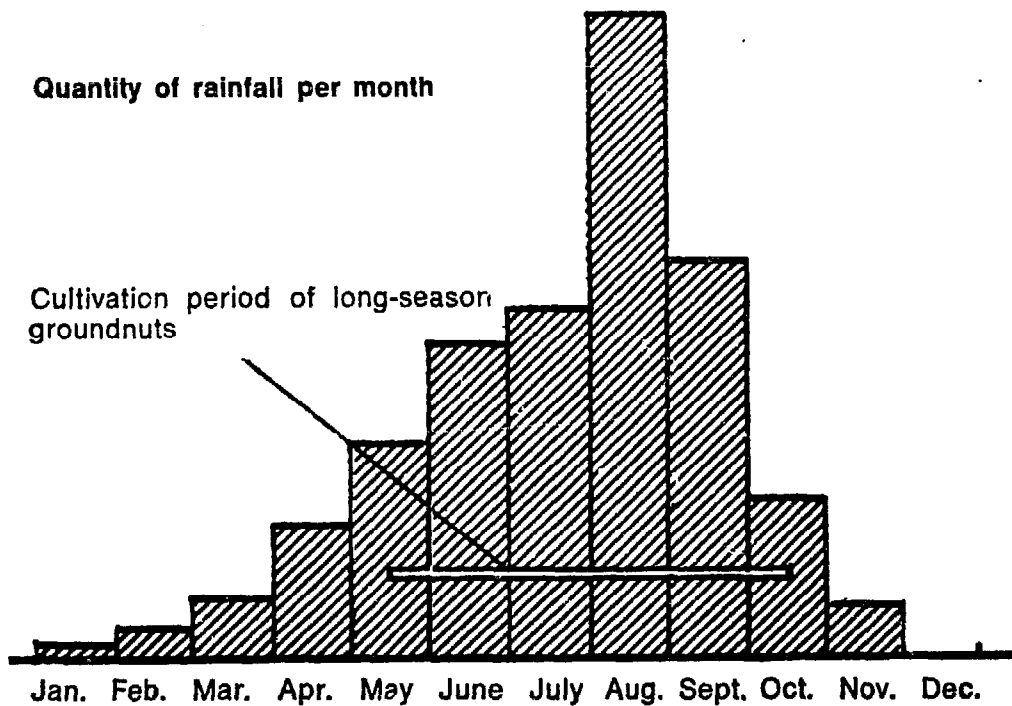
● **Mali, Kayes region**

The rainy season is **short**: it is best to sow **short-season** groundnuts.



● **Upper Volta, Niangoloko region**

The rainy season is **long**: it is best to sow **long-season** groundnuts.



● **Congo (Brazzaville), Loudima region**

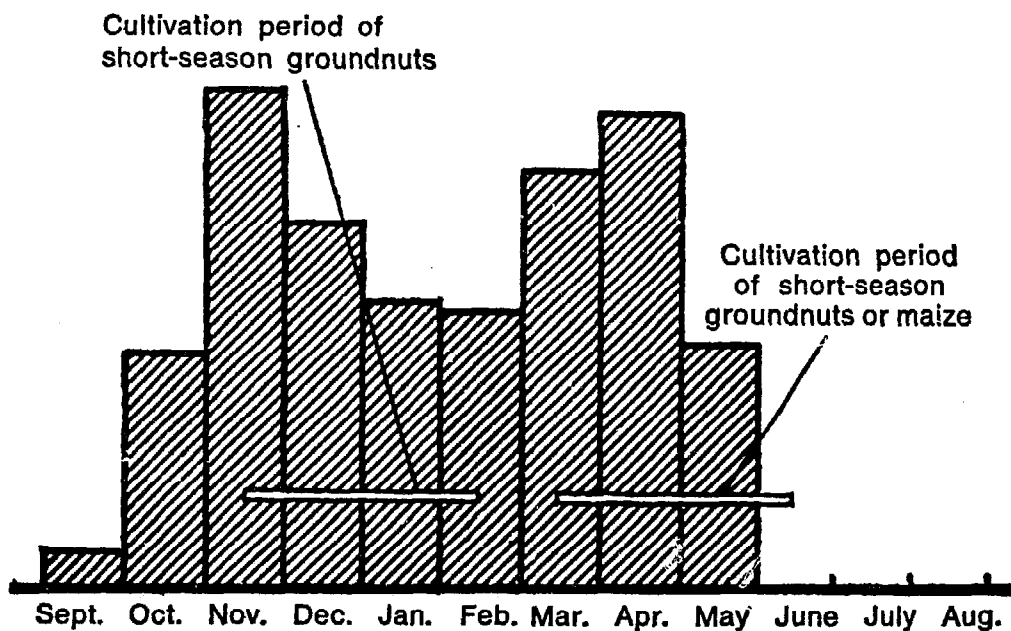
There are **two rainy seasons**.

Two crops can be grown in one year.

During the first rainy season one can grow **short-season groundnuts** (15 November to 15 February).

During the second rainy season one can grow **short-season groundnuts or maize** (15 March to end June).

Quantity of rainfall per month



HOW TO SOW

25. Some farmers have the habit of sowing without planning.

They make a little hole with a stick or the hoe, and in that hole they put a groundnut seed and then cover it up with earth.

But the seeds are sown all over the place.

Sometimes the plants are too close together and get in each other's way when growing.

Sometimes the plants are not close enough. They don't make full use of the soil.

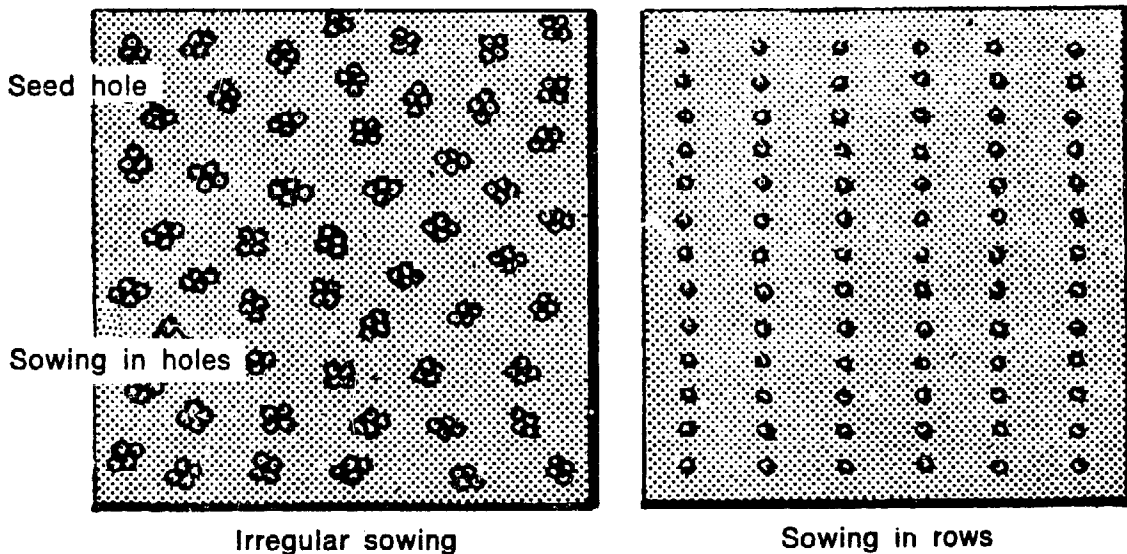
Without a plan you will not get the right density.

When weeding has to be done, the young plants get trodden on and are often damaged.

26. By sowing in rows you can

- place your seeds at the same distance from each other along the rows;
- calculate more easily the amount of seed needed;
- weed more easily, because the animal drawing the hoe can walk between the rows;
- give each plant the same amount of fertilizer.

It is better to sow in rows.



27. Put one seed only in each hole.

Put the groundnut into the earth at a depth of 4 or 5 centimetres.

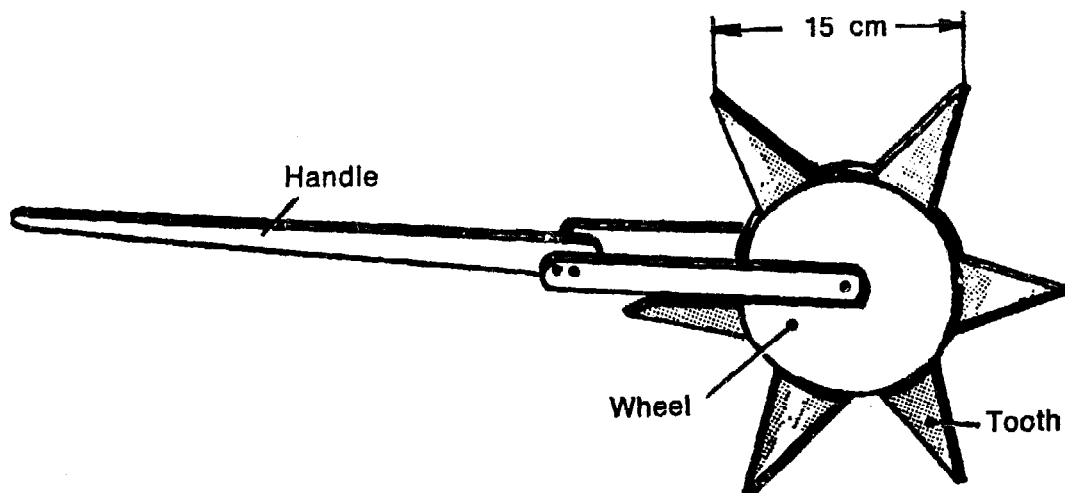
Sow all the seeds at the same depth.

Cover the seeds well with earth. Like that they do not dry out in the sun.

After tracing your rows with a marker, sow either by hand, or with the help of a spacing wheel, or with a seed-planting machine.

28. Spacing wheel.

This can be made of wood or of iron. Each tooth makes a little hole in the soil. Put a seed in each hole, and cover the seed with a little earth, either with the hoe or with your foot.



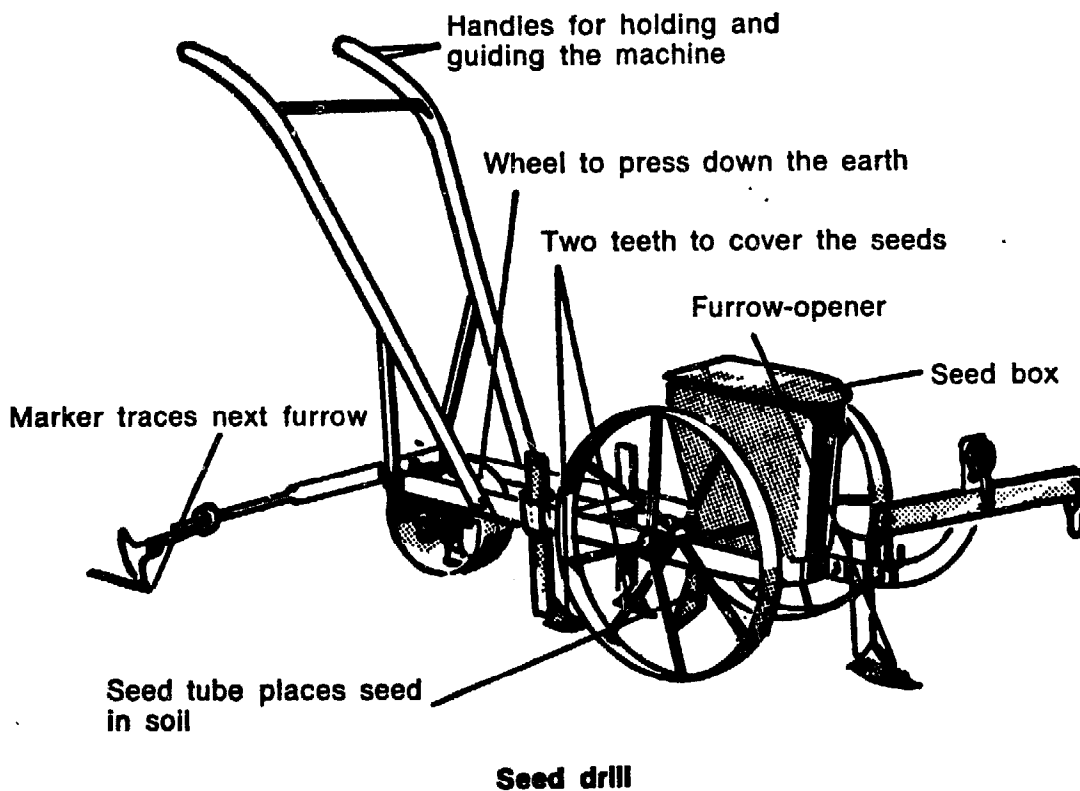
29. Seed drill.

In several countries people are beginning to use seed drills.

These can be drawn by a donkey or by oxen, or pushed by hand.

The seed drill makes a furrow and places the seeds in the soil at the same distance from each other and all at the same depth.

With some seed drills fertilizer can be applied at the same time.



WHAT IS THE CORRECT SPACING?

Very often groundnuts are not sown densely enough.

30. Dense spacing

- makes it easier to deal with the weeds — for if the ground is covered by groundnuts, fewer weeds can grow;
- increases the yield — for if there are more plants, there will also be more pods;
- makes it easier to control rosette disease;
- makes it easier to give each plant the same amount of fertilizer.

31. For long-season varieties, which take 5 months to ripen:

Leave 15 centimetres between seeds in each row, and 60 centimetres between rows.

Like that you will have 110 000 plants per hectare.

You should sow 110 kilogrammes of pods per hectare.

32. For short-season varieties, which take 3 months to ripen:

Leave 15 centimetres between seeds in each row, and 40 centimetres between rows.

Like that you will have 165 000 plants per hectare.

You should sow 160 kilogrammes of pods per hectare.

- On sloping ground, make the rows across the slope so as to prevent erosion.

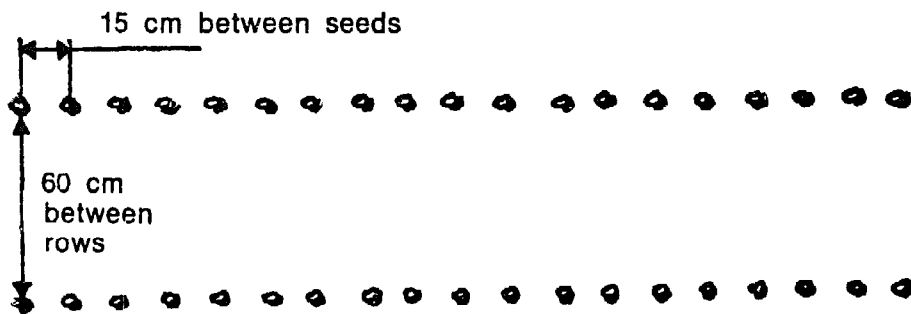
33. If you sow on ridges, in very damp soil:

Leave 15 centimetres between seeds in each ridge and 80 centimetres between ridges.

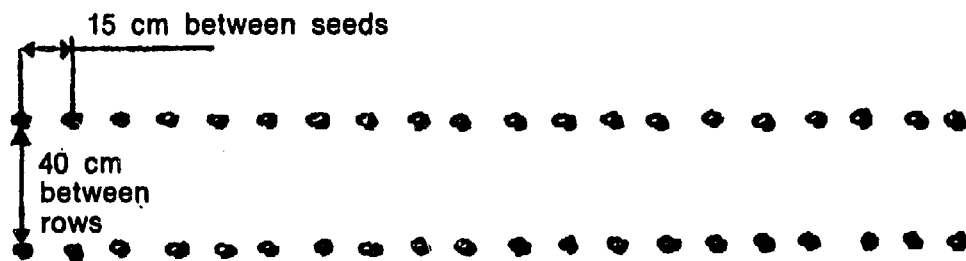
Like that you will have 85 000 plants per hectare.

You should sow 80 kilogrammes of pods per hectare.

One week after sowing, replace any plants that have not grown.



Density of 110 000 plants per hectare



Density of 165 000 plants per hectare

APPLYING FERTILIZERS

- 34. Fertilizers give the plant the mineral salts which feed it.**

But it is useless to apply fertilizers if you have not tilled your field well and if you have not sown densely. Fertilizers help only if the plants are spaced closely. If the field has not been well tilled and the crop is not sown densely enough, it is a waste of time and money to apply fertilizers.

- 35. Apply fertilizers two weeks after sowing**, when you see two leaves quite open on the big stem of the groundnut plant. Then the plant will get its nourishment at flowering time.

You can also apply fertilizers **when you sow**, if your seed drill can sow and apply fertilizer at the same time.

WHAT FERTILIZERS TO USE

- 36. Groundnuts need above all phosphorus, calcium and sulfur.**

The fertilizer called **superphosphate** contains these in the form of mineral salts.

But different amounts of fertilizers have to be used in different areas, because the soils are not the same.

Ask your extension worker what fertilizer to choose and how much of it to apply.

- 37. To apply too much fertilizer is also a waste of money.**

Example:

On an experimental field, an application of 75 kilogrammes of superphosphate per hectare resulted in a crop of 1 300 kilogrammes of unshelled groundnuts. An application of 150 kilogrammes of superphosphate per hectare yielded a crop of only 1 340 kilogrammes. The extra 40 kilogrammes of groundnuts did not pay for the extra 75 kilogrammes of fertilizer used.

Groundnuts can use chemical fertilizers better if you put organic manure on the field before tilling.

HOW TO APPLY FERTILIZERS

38. This is difficult. You must learn how to do it and pay careful attention.

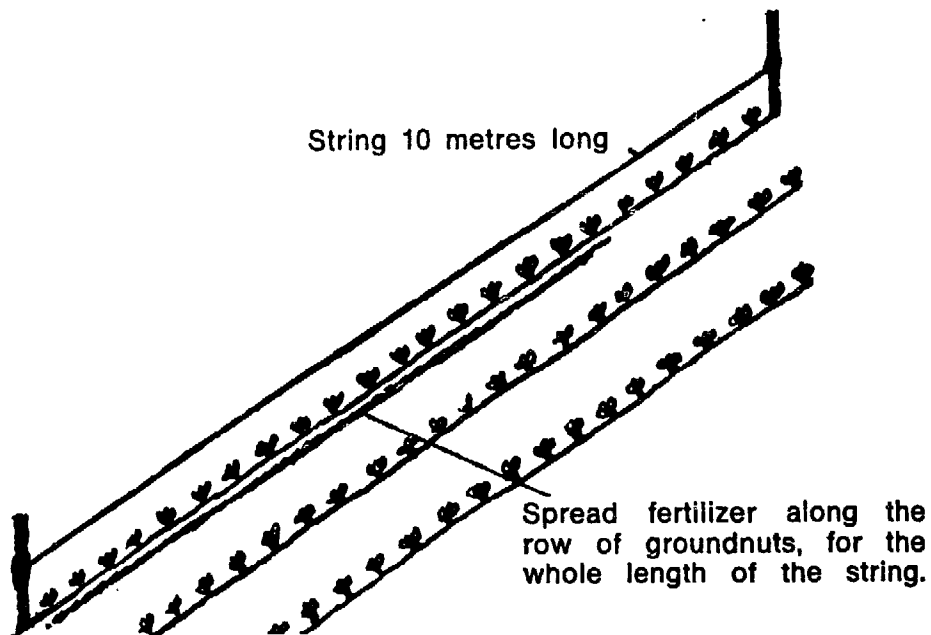
The extension worker will teach you how to apply fertilizers correctly.

If you apply fertilizers with a fertilizer distributor attached to the seed drill or hoe, **you must carefully set the distributor in such a way that the whole field gets fertilizer.** You must watch the distributor to see that fertilizer always comes out, for the distributor may get blocked up by earth or weeds.

If you apply fertilizers by hand or by using a scoop, **you must give fertilizer to each plant, and the same amount to each plant.**

After you have spread your fertilizer, work it into the soil with a hoe.

Always cultivate a few days after applying fertilizers.



CULTIVATING

WHY CULTIVATION IS NEEDED

39. Cultivating means removing weeds.

Weeds would prevent the groundnuts from growing well.

They take water out of the soil.

They take up the mineral salts of the soil or those you have added to the soil with fertilizers.

They cast shade.

Cultivation stirs the soil and lets air into it.

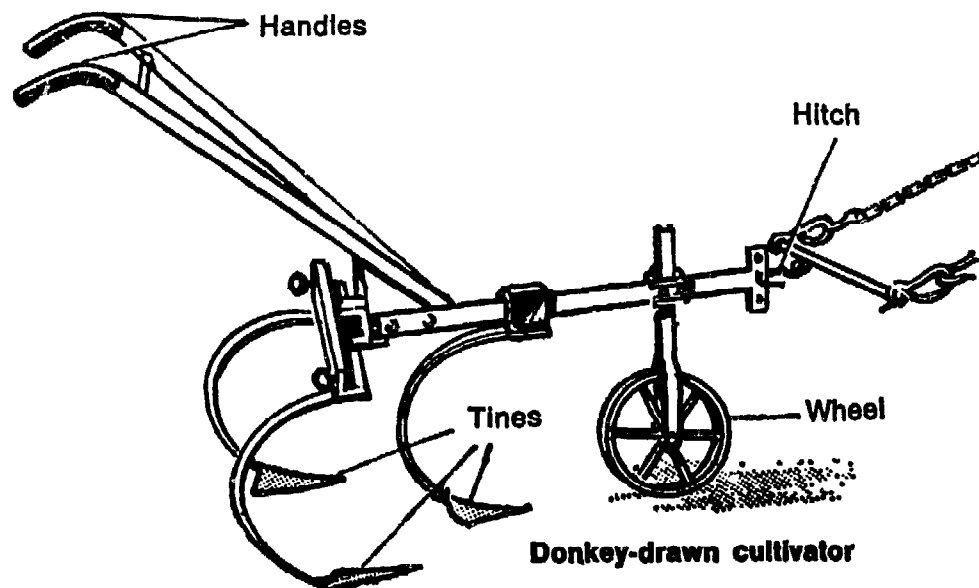
When the soil has been stirred it remains damper.

When there is air in the soil, the pods can grow better underground, because they will find underground the air they need.

HOW TO CULTIVATE

40. You can cultivate either with a hand hoe or with an animal-drawn cultivator.

But with an animal-drawn cultivator, you can cultivate only between rows; between the plants you have to cultivate with a hand hoe.



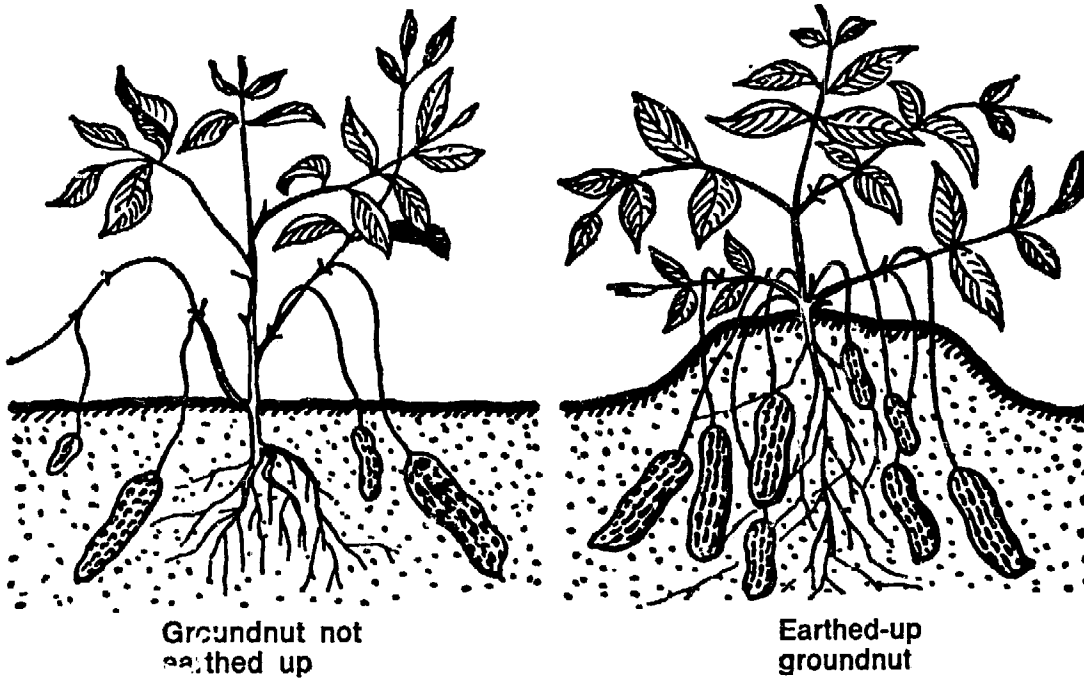
WHEN TO CULTIVATE

41. The first cultivation should be done soon after applying fertilizers, so that weeds do not feed on the fertilizer.

Cultivate again every time you see weeds growing. In any case, you must cultivate when the groundnut plants are in flower; cultivators loosen the soil, and the gynophores can more easily enter the soil.

When you cultivate at flowering time, earth up each plant a little; this will give the pods more earth to develop in.

Three months after sowing, stop cultivating. By this time, the groundnut stems and leaves cover the soil well enough, and cultivation might damage the pods.



PROTECT GROUNDNUTS FROM DISEASE

42. The disease which most often attacks groundnuts is called **rosette**.

This disease is carried by small insects which prick the leaves.

There is a product that kills these insects. But this product costs too much; the expense would not be repaid by the harvest.

43. You can protect your groundnuts in other ways.

- Sow rosette-resistant varieties;
- Sow at the right moment — then, the plants will be strong by the time the disease arrives;
- Cultivate often — like this you let the air into the soil and remove the weeds, so that air can circulate better among the leaves;
- Apply fertilizers — these make the plants strong;
- Never grow groundnuts two years running on the same field.

HARVESTING

WHEN TO HARVEST

44. Groundnuts are ready for harvesting when the stems begin to wilt, and the leaves turn yellow and drop. But if the rains stop too soon, the plants begin to wilt before the groundnuts are ripe. To know whether the groundnuts are ready for harvesting, open a few pods. **The nuts are ripe when the inside of the shell is brown.**

45. Do not harvest too late.

If you harvest too late:

- The plants are too dry, the leaves drop — this makes them less good as food for animals.
- The soil gets very hard — this makes it difficult to lift the pods, and you will leave many pods in the ground.
- The early varieties may germinate — then the nuts are not good to eat.

46. Do not harvest too early.

If you harvest too early:

- **There will be too much water in the groundnuts;**
They may rot;
It is difficult to keep them for a long time;
They will yield less oil;
They are less good as a food;
They are bad as seeds, because they are not ripe.
- **The pods will be full of water too;**
This makes them heavy, and the shelling yield will be low.

What is the shelling yield?

To shell means to separate the nuts from the shell. If you shell 100 kilogrammes of pods, you should get between 68 and 75 kilogrammes of groundnuts. This means that the shelling yield is between 68 and 75 percent.

When the pods are full of water, they are heavy, and so 100 kilogrammes of pods will yield fewer kilogrammes of nuts.

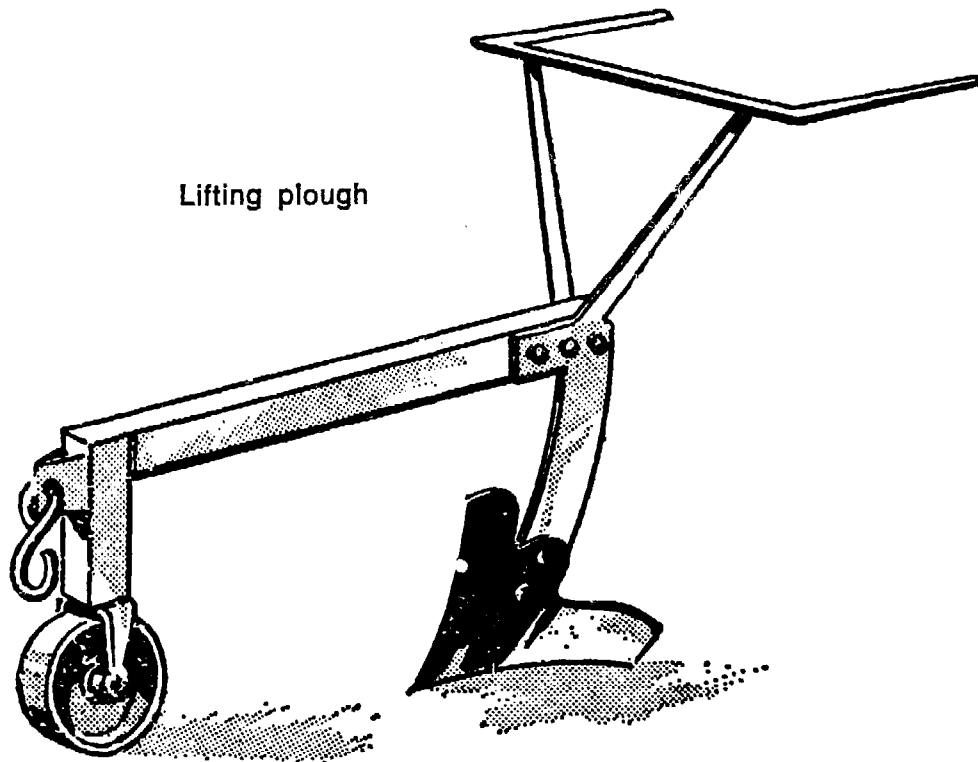
Before harvesting you must wait until there is less water in the pods.

HOW TO HARVEST

47. You can lift the pods by hand. But this takes a long time.

The soil gets hard before you have finished harvesting. It is quicker to use an **animal-drawn lifting plough**.

With a lifting plough you can lift a lot of groundnuts quickly and fewer will be left in the ground.



WHAT TO DO AFTER HARVESTING

48. When the groundnut plants are out of the ground

- Turn them over.

If the sun is strong, leave the plants turned over only for 4 to 6 hours; if the sun is not very strong, you can leave them turned over for a day or two.

In all cases make little heaps afterwards, so that the groundnuts go on drying slowly.

When the groundnuts are quite dry

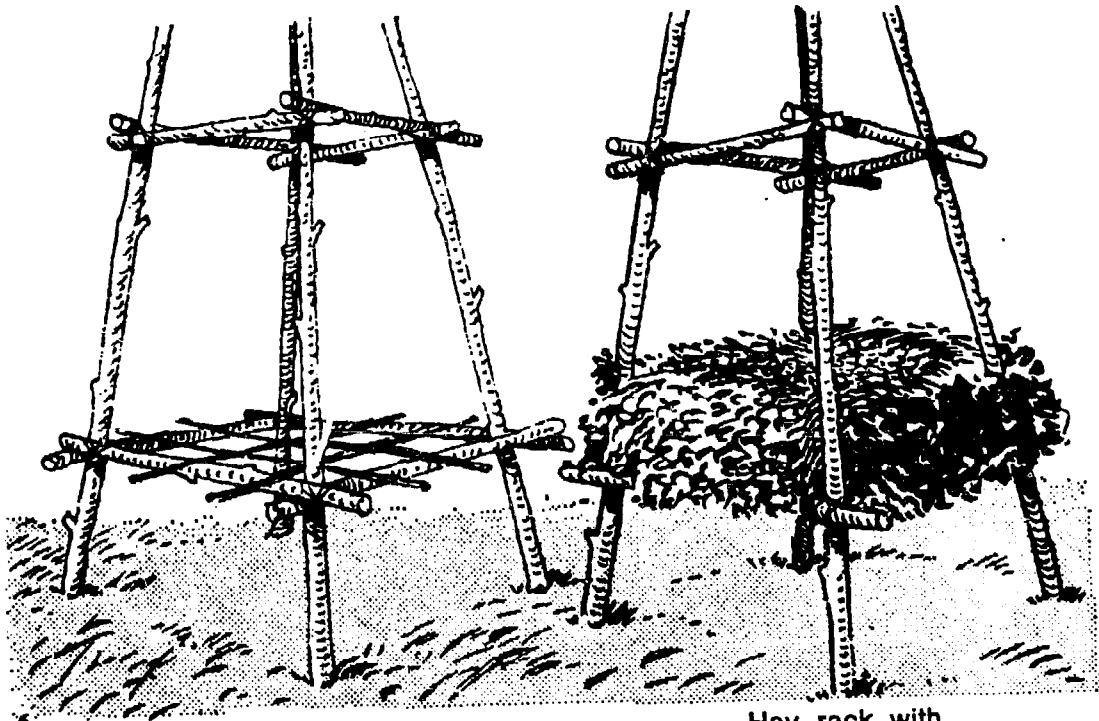
- Put the groundnut plants on a wooden hay rack, so that the plants do not touch the ground.

An important warning

Do not leave the groundnuts on the field in full sun for several days after lifting them. The plants would dry out too quickly and the leaves would drop.

Do not put the groundnuts in a heap if they are still green, or if they are wet from rain.

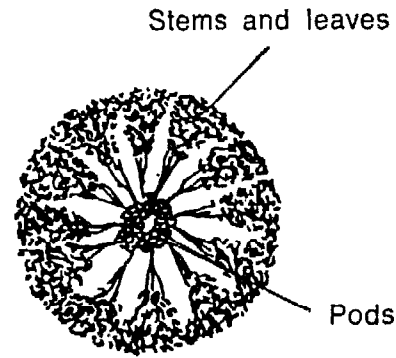
Do not leave the groundnut in heaps after heavy rain — the stems and leaves may rot.



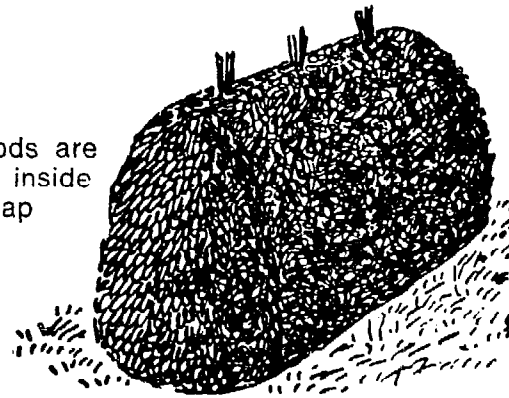
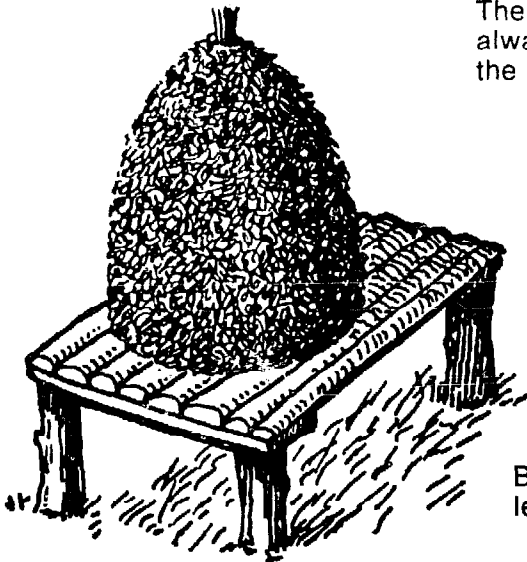
Hay rack

Hay rack with
groundnut plants
set to dry

HOW TO HEAP GROUNDNUTS



The pods are
always inside
the heap



By raising the heap above ground
level you prevent termites from
attacking the groundnuts

STORING

49. You will sell part of your crop.

But you also will keep some of it, to feed your family and to have seeds for the following year.

Before putting the groundnuts into your barn, clean the barn very well.

Like that you will remove any insects, grubs and dirt left over from the last crop. Finally disinfect your barn.

Do not shell the groundnuts.

The shells protect the nuts against insects.

MACHINES AND ANIMAL POWER ARE VERY USEFUL IN GROWING GROUNDNUTS

Groundnuts are a crop that needs a lot of work. Cultivating, sowing, lifting all take a lot of time.

50. With machines and animals, you can work faster and better.

- **With the plough**
you can turn over the soil better, and you will not be late for sowing.
- **With a hoe or a seed drill**
sowing is done more quickly. You can get all your seeds sown while the soil is still damp. You can sow your seeds at the right distance from each other so they will grow at a good density.

If you spend too much time sowing, the last seeds you sow do not have time to ripen.

- **By sowing in rows with the help of a seed drill you can cultivate with an animal-drawn hoe.**
The weeds will not take nourishment away from the groundnuts.
- **With a lifting plough, you can lift your crop better; the soil will not get hard before you finish.**
- **With a tractor all the work is easier.**

If you know how to improve the soil by a good rotation, by looking after the groundnut crop well;
If you can come to an agreement with your neighbours, to put the fields under groundnuts next to each other, to join in cooperatives and make joint credit applications;

If you can learn to keep accounts and to work out how much you spend and how much you earn;
Then you will know whether you and your neighbours together can afford to buy a tractor, and so earn more money after paying for the machines, the petrol, the oil, the necessary repairs and all other expenses.

CROP ROTATION

51. In order to make sure of a good harvest and to keep your soil rich, **never sow groundnuts for two years running on the same field.**

In the second year, there would not be enough nourishment in the soil to feed the groundnuts.

Always grow a different crop every year on the same field.

This is called crop rotation.

If you change crops every year, the plants do not take the same nutrients out of the soil, and they also take their nourishment at different depths of soil.

- **Examples of crop rotation:**

First year : Groundnuts (or cotton)

Second year : Maize (or millet)

Afterwards : Bush fallow (for 3 or 4 years)

First year : Groundnuts

Second year : Millet or sorghum

Third year : Groundnuts

Afterwards : Bush fallow (for 2 or 3 years)

- With rotations like these, groundnuts can use the mineral salts left by the fallow.

In their turn, the grain crops (such as maize and millet) can use the mineral salts left by groundnuts.

Find out from your extension service which is the best kind of crop rotation for your area.

SUGGESTED QUESTION PAPER

FILL IN THE MISSING WORDS

For a field of good density, you must sow seeds which....

When the rainy season is short, sow ... varieties.

Before sowing, make an ... to see whether the seeds are good.

Groundnuts grow better in ... soil.

The nuts are ripe when the inside of the shell is

Seeds from selected varieties resist ... better.

ANSWER THE FOLLOWING QUESTIONS

Why must you choose good seed?

Why is it better to sow groundnuts in rows?

How do you know when your groundnuts are ready for harvesting?

What is the shelling yield?

Why must groundnuts be sown at the right density?

What varieties are sown in your region?

On what date are you advised to sow groundnuts in your region?

How do you store your harvested groundnuts?

Why must fertilizers be given to groundnuts?

What sort of soil is good for groundnuts?

EXERCISES

A farmer has sown groundnuts in a field which is 60 metres wide and 115 metres long. What is the area of the field?

He leaves 15 centimetres between the seeds. How many plants has he sown in a row?

He leaves 40 centimetres between rows. How many rows are there in his field?

How many plants has he sown in this field?

How many kilogrammes of seed does he need?

A farmer makes a germination test. He puts 80 seeds into damp sand.

Six days later he counts the seeds which have germinated: he finds there are 70.

What is the germination rate of the seeds? Is it a good germination rate?

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