

Chapter 5

Vegetable propagation and sowing

77

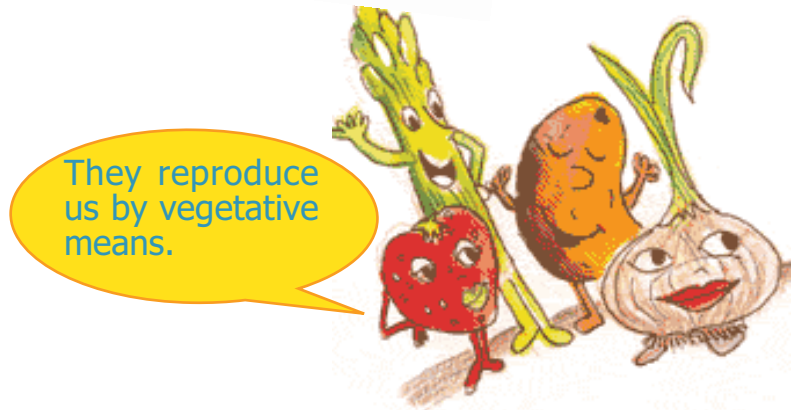


How do you propagate vegetables?

Some vegetables are reproduced by seed and others through vegetative plant parts.

1- Seed: Most vegetables are reproduced by seeds. That is why it is very important to learn to use only good seeds.

2- Vegetable propagation: Although some vegetables can be reproduced by seed, they reproduce more easily through grafts, bulbs, tubers, stems or other parts of the plant.



2-Seed:



A seed is like a small plant that..... → Upon receiving the suitable conditions of moisture and temperature. → Germinates to produce an adult plant like the one from where it came.

If the seeds come from infected or defective plants..... → They will produce infected or defective plants, and you will not get a healthy vegetable.

If the seeds come from healthy and vigorous plants.... → They will produce healthy, vigorous and productive plants.



What are good quality seeds like?

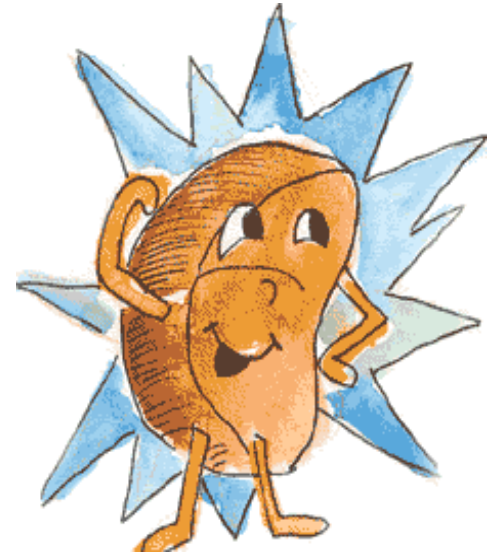
All seeds must be of the same type. → **Pure variety**

They must be clean, without foreign particles, rubbish or weeds. → **Physically pure**

Free of contamination, pests and diseases. → **Health**

Most seeds should germinate when they have suitable temperature and moisture. → **Germination ability**

The seeds must germinate quickly and the plants should be vigorous. → **Vigor**



How do you obtain good seeds for the garden?

You can consult with your area technicians and their institutions; they can usually provide small amounts of vegetable seeds.

It is also possible to interchange seeds with the neighbors.

If there is a vegetable research station in your area visit it! The people who work there will help you obtain the seeds that you need.



Can seeds be produced in the garden?



Yes, but it is necessary to know the plants very well. When they bloom, how and when the seeds are harvested.

It is easier to obtain seeds from some vegetables, for example: pumpkin, zucchini, watermelon, and beans.

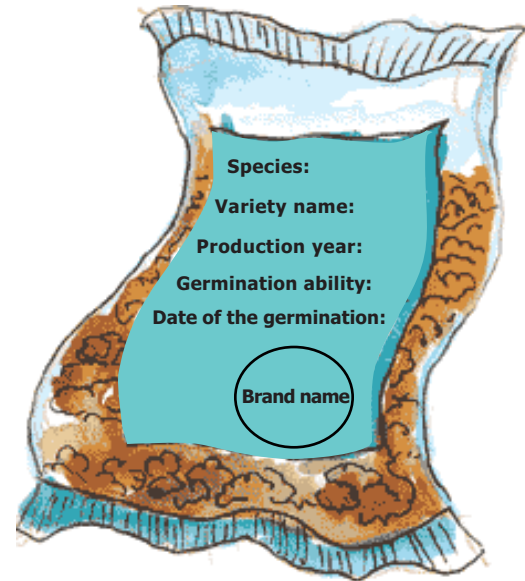
You should always obtain seeds from the best plants! These should be large, vigorous and free of disease.

If you are going to buy seeds, choose those that come in labeled, sealed packages; these are almost always of better quality.

The package label should specify:

- **Species**
- **Variety name**
- **Production year: The seeds should not be more than one year old.**
- **Germination ability: % of germination.**
- **Date of the germination analysis.**
- **Brand name or company**

Warning! If you have any doubts on the quality of the seeds that will be used, you can run some tests.



Next we will see how to perform some germination tests.

Germination tests

Materials:

- 50 seeds
- Cotton
- Paper towels or newspaper

Procedure



Place a tight layer of cotton on a plate and cover it with bathroom tissue. Add water to dampen it and remove any excess water.

Place the seeds in an orderly fashion on the wet paper.

Moisten it every day. Keep the plate inside the house in a warm place.

After 6 or 7 days count all the seeds that are germinating.

Germination test results:

If 40 or more of the 50 seeds that were planted, are germinating, it means that they have very good germinating power (more than 80 %).

If less than half have germinated and the plants are weak and are growing unevenly, the seeds are weak and should not be used.



Test 14

Match the following phrases that go together with lines:

In order to germinate, seeds need....

A seed is.....

A good quality seed.....

Germinates quickly.

Moisture and suitable temperature.

The smallest plant.

How do you sow?

There are two ways to sow vegetables:

Direct sowing: The seeds are placed directly in the soil where they will grow. This method is used for vegetables with large seeds that are resistant to weather changes.

Seedlings and transplants: This method is used when the seed is very small and needs special care to germinate.



Answers for test 14



In order to germinate, seeds need....

A seed is.....

A good quality seed.....

Germinates quickly.

Moisture and suitable temperature.

The smallest plant.

Direct sowing

Direct sowing can be:

- **Broadcast:** the seeds are scattered through out the surface of the bed.
- **In line:** the seeds are placed at regular distances in rows.
- **Drilling:** 2 to 3 seeds are placed in small separate holes.





Now you will learn how to sow directly in line!:

Materials:

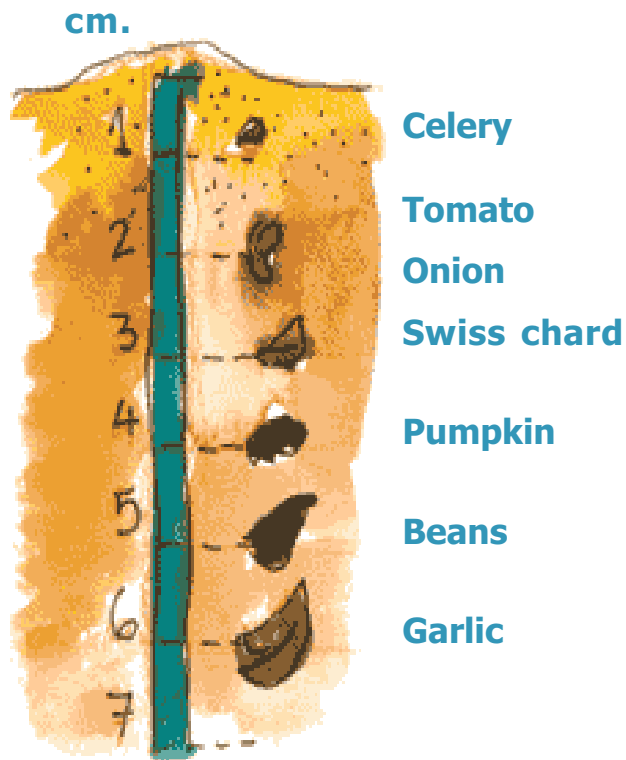
- stakes
- string
- weeding hoe
- labels

Procedure:

- 1- Mark the sowing lines with a string line, attach a stake at each end to stretch it across the bed.
- 2- Trace the furrows using the string line as a guide. The depth of the furrow depends the size of the seeds (see the following chart)
- 3- Find out how many seeds are necessary for each vegetable.
- 4- Neatly distribute the seeds in the furrow by hand.
- 5- Place a stake with the name of the each vegetable sown on the furrow.

How deep do you sow?

Larger seeds are buried deeper, smaller ones are nearer the surface.



You can consult the sowing depth of each vegetable and the amount of seeds in the chart at the end of the manual.



Direct sowing in line is ready.

Now you have to cover the seeds with mulch!



Mulch is made with organic compost, or decomposed manure, and sand or soil in equal parts.

Once the sowed furrow has been covered with mulch you need to tamp it softly with the back of the hoe.

Finally! You have to water it. The soil must always be moist and therefore it is necessary to water it continually but without overdoing it.

How to water after sowing?

At first you can water with a spray hose or watering can to ensure that the water reaches the seeds.

When the plants start to grow, they can be watered by irrigation channel, sprinklers or with a drip system as you will see in chapter 6.



The plants are already growing in 5 to 10 days.

Great! The first plants have already appeared.

You have to pay attention to when the plants have 3 or 4 leaves because then you have to **thin** them.

Thinning means to eliminate surplus plants leaving only those at fixed distances.



To learn how to thin the seedlings see the following page.

Thinning.

- 1- Loosen the soil between the furrows with the hoe.
- 2- With the weeding hoe eliminate plants between the small groups leaving those at the desired distance.
- 3- Manually remove small or weak plants leaving only one.

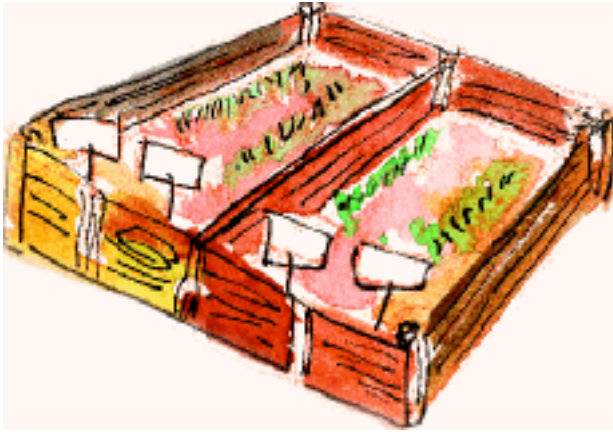


Test 15

Complete each sentence using the following words: **depth, mulch, beans.**

- 1- are direct sowing vegetables.
- 2- Sowing depends on the size of the seed.
- 3- is used to cover just sowed seeds.

2- Seedlings and transplants.



If the seeds that you want to sow are very small, or if they take a long time to germinate and need special care, it is advisable to sow them in seedling beds or seed trays.



Answers
for test 15

- 1- Beans
- 2- Depth
- 3- Mulch

Seedlings have many advantages.

When you plant seedlings: you use the land better, because the plants spend part of their life in a small space. It is easier to take care of small plants. (weeding, fertilizing, watering)

The plants can be protected from the cold, the sun and the rain.



With seedlings there are fewer losses and less seeds are needed than with direct sowing.

Not all vegetables can be started as seedlings.

Check the chart at the end of this manual to see if the vegetable that you are planting is for direct sowing or seedling.



For example, the following are started from seedlings:

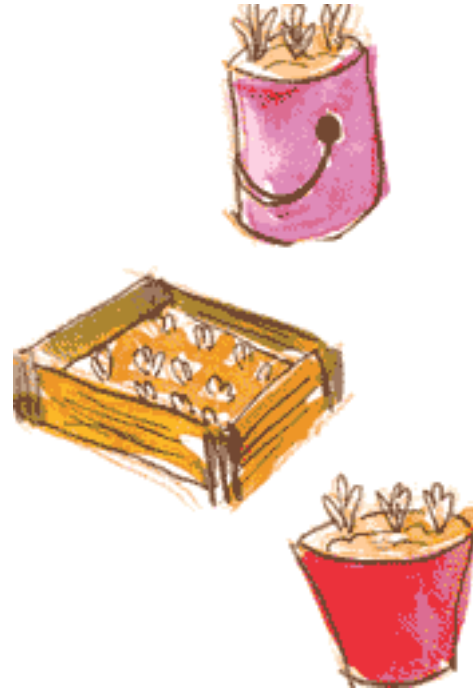
- Cabbage
- Broccoli
- Cauliflower
- Tomato
- Pepper
- Onion
- Celery
- Lettuce

Seedlings can be started in fruit boxes, plastic containers, used tins, flowerpots, etc.

Seedlings can also be started in beds in the soil if you have a lot of land and when you need many plants.

But it is easier to do it in containers or seed trays!

Let us see how to make them!



First you should prepare the soil mixture to fill the containers.

The mixture is made of:

- Soil
- Sand
- Organic compost

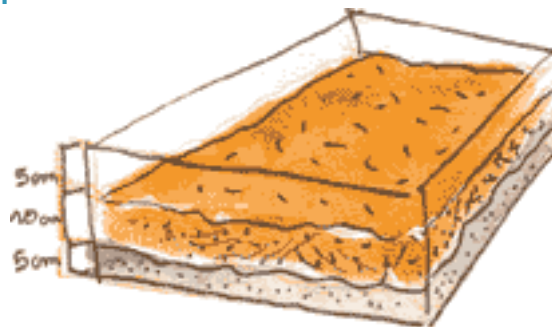
In a clean section of the garden, pour a wheelbarrow full of soil, one of sand and one of organic compost. Turn everything over with a shovel and break up any lumps in the mixture so that it is fine and loose.



Fill the containers with a layer of sand on the bottom and the rest with the prepared mixture.

Do not use containers that were used last year. These can store diseases.

The boxes or cans will end up like this!



Note! The container must have holes at the bottom.



And now to plant and look after the seedlings.

1



Mark small furrows on the surface with a stick.

2



Place the seeds on the furrows.

3



Manually cover the seeds with the soil around the furrows.

4



Tamp down the soil lightly with a piece of board.

5



Finally add a layer of mulch and label it to identify the seeds that you planted.

It is important to water the seedlings well.

Is the planting finished?

You should water immediately. Water with a very fine sprinkle so as to not disturb the seeds or the new shoots. The mixture should always be kept damp.

Water it daily.

It is best to water it in the morning so that the excess moisture evaporates during the day.





Weeding.

After a few days the seeds will start to germinate.

Be careful! Weeds will also start to grow.

These need to be removed because they consume nutrients and water from the seedlings.

Test 16

Complete the sentences with the following words: **label, sown, land, holes.**

- 1- With seedlings you take better advantage of.....
- 2- Not all vegetables can be.....as seedlings.
- 3- It is important to.....the seeds you planted.
- 4- The bottom of the containers must have

Run a weeding tool between the furrows about two centimeters. The soil loosens and then you can remove new weeds.

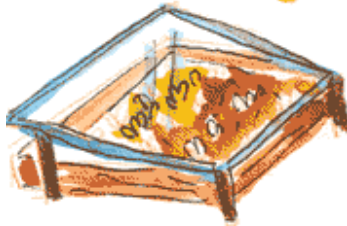
It is better to weed when the surface is dry because the crust breaks more easily.

If the seedlings are too close together you can thin them out.



- 1- Land
- 2- Sown
- 3- Label
- 4- Holes

Protecting the seedlings.



Seedlings must be protected from:

-Heavy rain

-Frost

-Strong sunshine

-Heat

You can protect the seedlings by placing glass or transparent plastic over the containers, taking care that they are not in direct sunlight. You can also protect them by placing them indoors.

Remember that
seedlings need
air!

Transplanting.

If, 30 to 40 days after sowing, the seedlings have 4 to 5 leaves and are firm they are ready to be transplanted.

Transplanting means removing the seedlings from the containers and planting them in the spot where they will continue to grow until harvest.

Before transplanting you need to prepare the seedlings!



When you transplant, the soil should be damp but not too wet.



Do not water 2 to 3 days before transplanting.



Water the day you transplant.

How do you transplant?



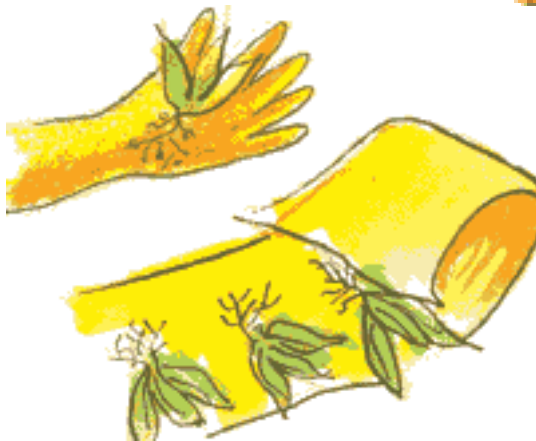
- 1- Remove the seedlings with a small trowel taking up as much soil as possible.
- 2- Carefully separate them one by one on a wet cloth or paper. Now is a good time to remove any small or weak plants.
- 3- Do not take out more seedlings than you plan to plant on that day. Keep the seedlings in the shade and under a wet cloth while you transplant.



You should transplant in the morning or on cloudy days.

If the seedlings are too close together in the seed beds you can take many clusters out at the same time.

Shake them lightly to separate the soil from the roots. **The roots are then bare.**





Remember!

You should prepare the soil before transplanting as shown in Chapter 4.

And now we plant!

If the seedlings come in soil plugs...

1



Make holes in a line on raised beds. The distance between holes depends on the vegetable to be planted. Check the chart at the end of the manual.

2



Place the seedling with the whole plug into the hole.

3



Press the soil with your hands so that the roots make contact with the earth below.

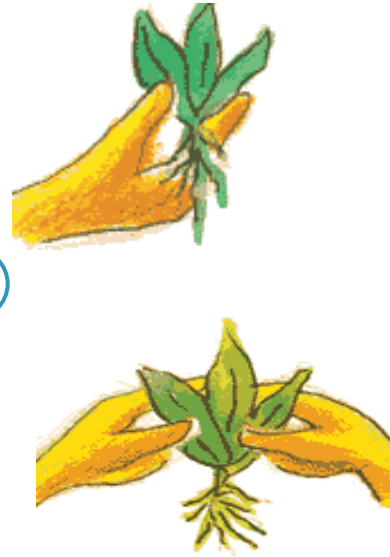
If the roots are bare

1



Make holes along the furrows with a dibber (made with a stick).

2



Holding the outer leaves place the seedling in the hole. The roots should be spread out.

3



The seedling should be planted a little bit deeper than it was in the container.

4



Press the soil around the seedling without damaging the roots.

The seedlings have to be watered immediately after transplanting



You can water by furrows.



You can also use a watering can, but without wetting the leaves. We will see watering in Chapter 6



Check every hole, covering any seedlings that may have come uncovered and after a few days replacing any that may have died with new seedlings.

Vegetative propagation

Some vegetables can be reproduced by planting living parts of the same plant:

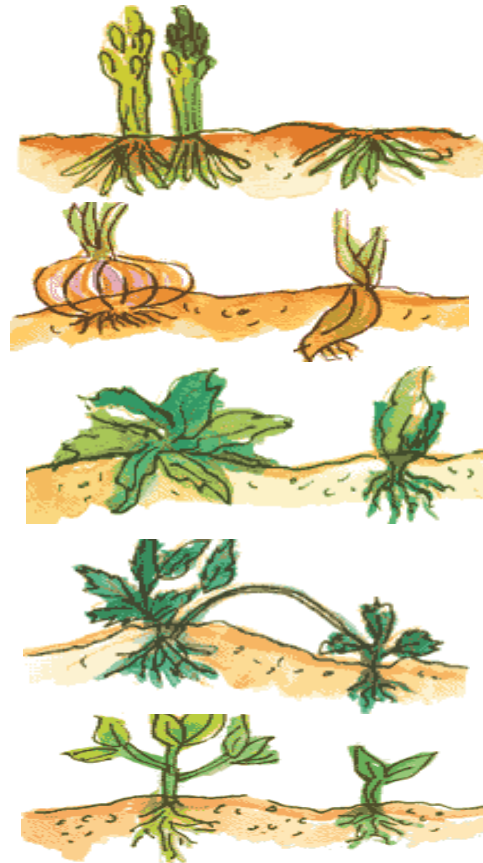
Asparagus: Is reproduced by roots or crowns.

Garlic: Is reproduced by cloves or with bulbs.

Artichoke: Is reproduced by suckers.

Strawberry: By runners.

Sweet potato: By stem cuttings and tuber pieces.





When you have the vegetables in the garden, check them and pick the best plants.

The mother plants will be the largest and strongest plants. From these you will obtain propagation material.

If you notice that the plants are weak or yellow it is better to renew your vegetables. Get the top quality material.

In this chapter we have seen:
Propagation and vegetable
planting.

1-Seed:

Seed quality
Direct sowing
Seedlings
Transplanting

2-Vegetative propagation



Test 17

Place a "T" if the sentence is true and an "F" if it is false.

- 1- For healthy plants you should use good quality seeds.
- 2- Direct sowing is used for plants that do not tolerate transplanting.
- 3- Soil moisture is not important at planting time.
- 4- If the seed is slow to germinate, you should start it as a seedling.
- 5- It is important to air the seedlings to avoid diseases.
- 6- To start seedlings you use more seeds than in direct sowing.
- 7- You should water seedlings 2 days before transplanting.
- 8- For vegetative propagation you choose the healthiest and strongest mother plants.

If all your answers were correct you can go up another step. Congratulations!



Answers
for test 17

- 1- T
- 2- T
- 3- F
- 4- T
- 5- T
- 6- F
- 7- F
- 8- T

If two or more answers were incorrect you should review the material in Chapter 5.

Expert horticulturists

Chapter 7

Chapter 6

Chapter 5

Chapter 4

Chapter 3

Chapter 2

Chapter 1

