



# Vegetables — for the family and for cash

Dieter Lippmann

Basic techniques for growing them  
in arid and semi-arid areas





The edges of the plastic sheeting are covered with some soil to conserve humidity and moisture in the seedbed.

### **Irrigating, singling, fertilising, weeding seedlings**

After seeds have successfully germinated and emerged they need nursing like:

- Irrigation
- Singling
- Fertilisation
- Weeding and hoeing.

The emerged seedlings are not so sensitive to excessive moisture and the seedbeds can be flood-irrigated (see pictures page 50 and 51), but over-watering must be avoided. Speed of growth can be regulated by irrigation. The more moisture in the seedbed the better. But before seedlings are moved, they should be hardened off. This can be done by reducing the amount of irrigation water rapidly. The seedlings become harder and overcome the shock of moving better.



Seedlings may be too close and too many.



In this case we have to single the seedlings.

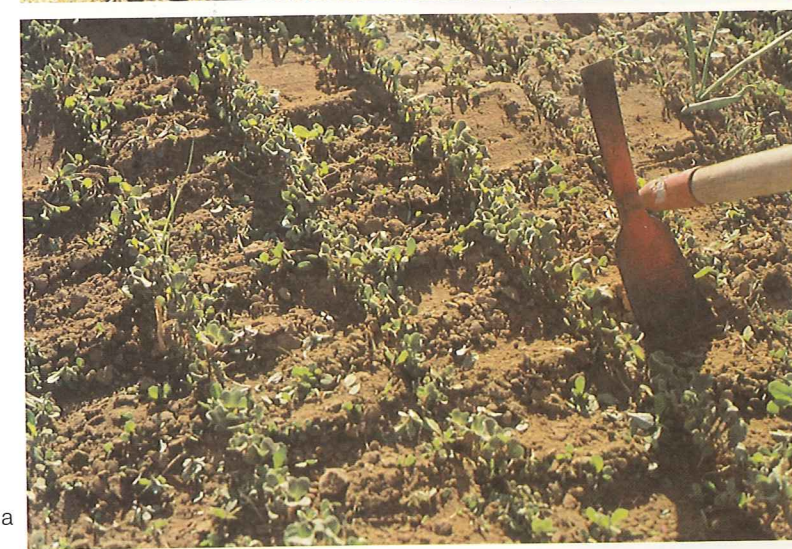


Tomato seedlings after singling.

When seedlings have reached a height of 5 cm we recommend a top dressing with ammonium phosphate (N:P=20:20). We broadcast 60 g of this fertiliser per square metre (about 3 heaped tablespoons). The fertilisation should be done just before hoeing and irrigation.

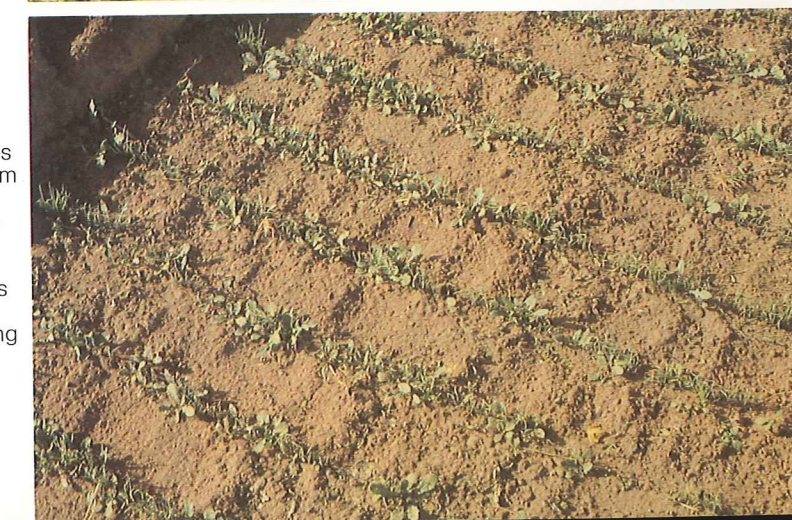


A badly infested onion seedbed. It needs weeding.



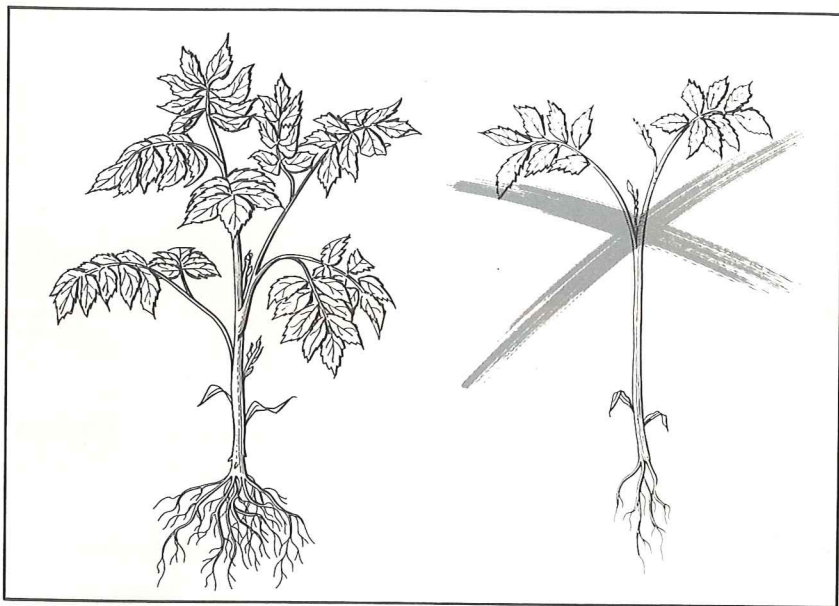
We can remove these weeds with a small hoe.

Now the seedlings have enough room to keep growing. The few weeds in the rows of onion seedlings can be handweeded. This shows one of the reasons for sowing in rows.





Well grown cabbage seedlings ready for transplanting.



On the left an ideal seedling, best for transplanting. On the right a thin etiolated seedling, which should be destroyed.

## Replanting from the seedbed to the field

### General aspects to keep in mind:

Seedlings suffer shock when they are transplanted.

What can we do to make the transplanting easier on the roots and allow the seedlings to grow away quickly?

To avoid the roots drying out we must protect them from the sun and wind.

### How to do it:

- To help prevent the seedlings drying out we half fill a bucket with water.
- Then we add clayey soil to the water and mix it to a thin mud.
- After that the seedlings can be lifted carefully from the seedbed with a digging fork or a hoe. The roots should remain intact and unharmed.
- The seedlings are bunched together and dipped into the muddy water in the bucket. Now the roots are protected from sun and wind.
- If only a few seedlings are required for replanting, they can be left in the bucket for taking to the field.
- If a lot of seedlings are required for replanting, once they have been dipped in the bucket they can be put into moist sacks or plastic sheeting for taking to the field.
- Onions and leeks should have their tops shortened to reduce evaporation loss of the newly replanted seedlings.



Seedlings with intact and unharmed roots after lifting from the seedbed.



A bunch of seedlings dipped in clay mud.



We see a bunch of onion seedlings that have been untreated; the roots are bare and exposed to the sun and wind. On the right we see a treated bunch of onion seedlings – this shows how well they can be kept with the proper treatment.

## Replanting from the seedbed to basins

Crop	Spacing in the row in cm	Spacing between rows in cm
Pepper, sweet	50	60
Pepper, hot	50	60
Cabbage	50	60
Kale	60	60
Brussel sprouts	60	60
Cauliflower	50	60
Endive	30	40
Lettuce	30	40
Onions	10	30
Leek	15	40
Kohlrabi	30	40
Asparagus	40	150
Eggplant	60	60

For intercropping, one lettuce or kohlrabi seedling can always be planted between two plants of cabbage, brussel sprouts, kale, cauliflower and pepper. For asparagus, intercropping is also recommended between rows, using small vegetables like radish, lettuce etc. during the first two years after planting.

### How to do it:

We are going to mark the field using this marker and then the seedlings will be planted into it.



The rows have been marked in one direction.



And now the rows across are made.



Where the rows cross is where a seedling will be planted.

In the surface of the soil is very hard we can use a hoe or a hand trowel to make the planting hole. Because the soil has been loosened, planting will be much easier and quicker.

If the soil is soft, as shown by the deep footprint in the picture on page 43, preparing the planting holes with a hoe is unnecessary. This basin is ready for replanting vegetable seedlings.



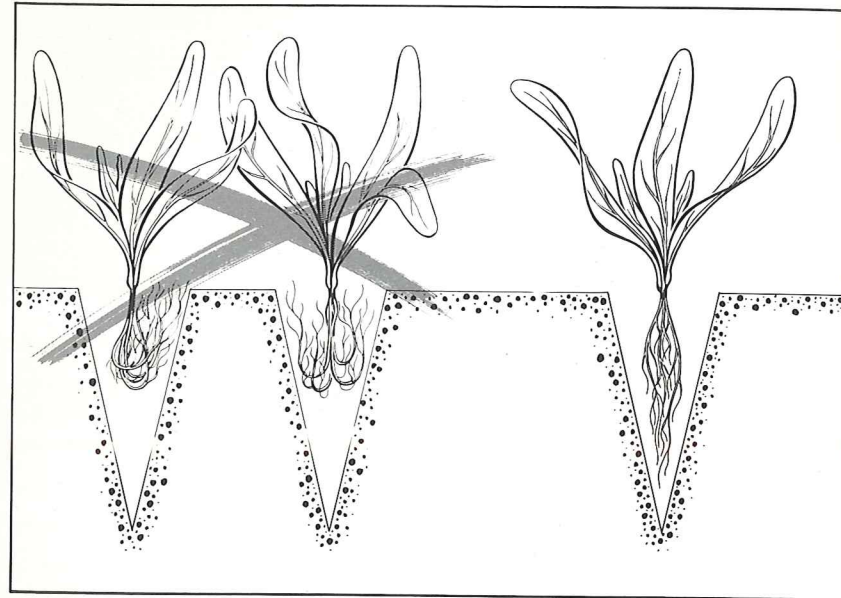
Now we can start replanting the young plants. Make a hole in the prepared soil with the right hand and hold the seedling in the left hand.



Make sure that the seedling is put into the prepared hole with its roots going straight down; do not bend the roots upwards. Gently push the soil back into the roots in the planting hole with the right hand and make sure the roots are well covered. Finally, press the soil slightly around the roots of the seedling.



Immediately after transplanting the plants should be watered. Here syphon pipes are used to lift the water from the irrigation ditch to the basin which is gradually flooded.



The right and wrong ways to plant seedlings. The one on the right is correctly planted with the roots going down, the two on the left are wrongly planted – the roots have been bent upwards. When replanting seedlings we must always keep this in mind.

After the water has drained away the plants will still look rather wilted. But by the following morning the plants will be beginning to stand up again and start growing after a few days.

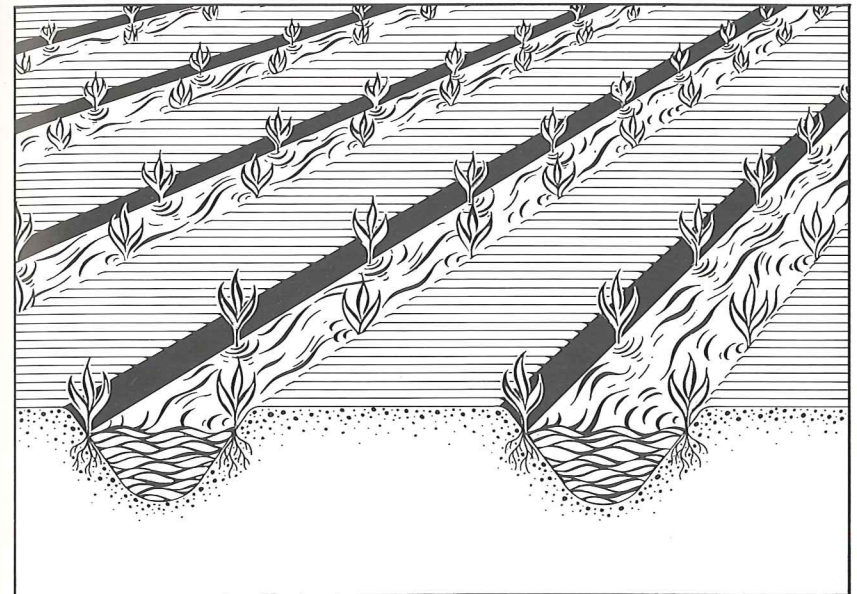
## Replanting from the seedbed to furrows

Crop	Spacing in the furrow in cm	Spacing between furrows in cm
Tomato plants	50	150

For intercropping one lettuce or kohlrabi could always be planted between two tomato plants.

### How to do it:

Before we start planting we must first irrigate. The furrows must be filled two-thirds full of water.



The level of the water and where to plant seedlings.

The water level is the exact mark where we are to plant the seedlings. This guarantees that all the seedlings are planted at the same level. After replanting all the seedlings are in the correct position to receive the irrigation water. The root collar must be placed exactly on the water line.



A planting hole is made in the moist, soft earth with the right hand and the seedling is held in the left hand. The roots of the seedling should be moved quickly into the prepared hole.



The seedlings are planted on both sides of the furrow.

### Replanting from the seedbed to ridges

Crop	Spacing on the ridges in cm	Spacing between ridges in cm
Onions	10	60
Leek	15	60
Lettuce	30	60
Kohlrabi	30	60
Cabbage	50	60
Cauliflower	50	60
Brussel sprouts	60	60
Pepper, sweet	50	60
Pepper, hot	50	60
Eggplants	60	60
Kale	50	60

Onions, leeks, lettuces and kohlrabis should be planted on both sides of the ridges.

For intercropping, one lettuce or kohlrabi seedling can always be planted between two cabbage, cauliflower, brussel sprouts, kale or pepper plants.

If seedlings are planted on only one side of the ridges, it should be done opposite to the side exposed to the wind. The ridges can give the seedlings some protection against cold, dry or hot winds.

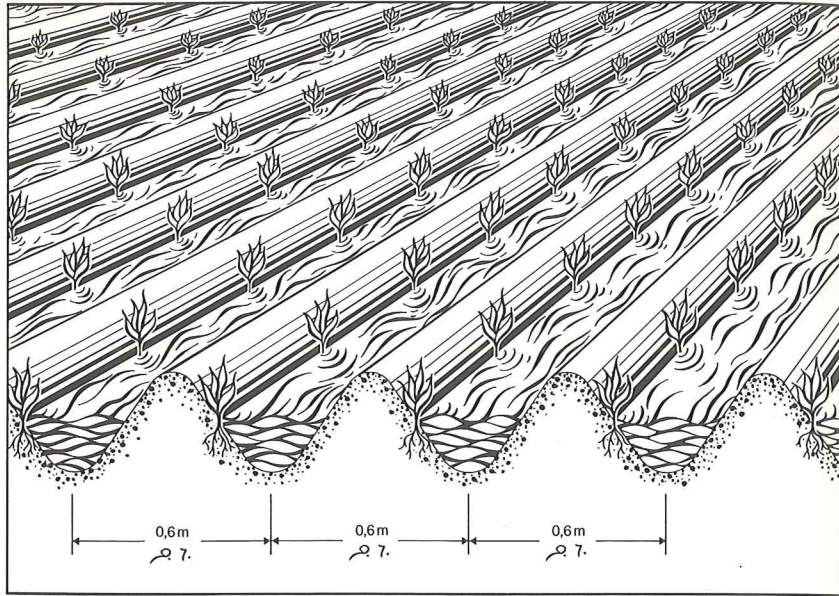
#### How to do it:

Planting along ridges is not quite so easy and we must be careful.



Ridges ready for replanting the seedlings.





Seedlings should be planted on ridges in the same way as in furrows, exactly along the water line.

The syphon pipes for the irrigation are fitted so they carry the irrigation water from the ditch straight between the furrows. To transplant seedlings into ridges exactly the same method can be used as for planting into furrows.

One ridge after the other will be irrigated and then planted. Planting should always be done from the dry land, so the soil texture on the irrigated part is not damaged and compressed by walking on it.



The seedlings are always replanted along the water level of the ridge.



Ridges just after being irrigated and planted with seedlings.