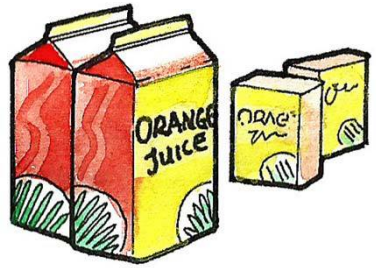
Requirements for successful organic citrus production

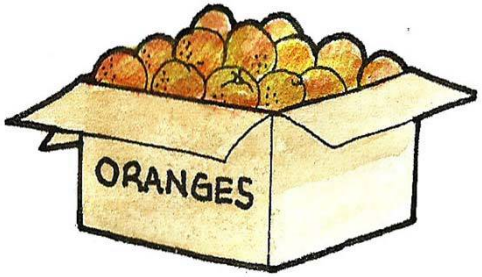
- Suitable site conditions
- Suitable varieties
- Proper orchard establishment



- Proper harvesting
- Proper storage
- Market access

- Motivation
- Know-how
- Labour

- Improving soil fertility
- Pest and disease management
- Water management
- Pruning and shade management



Integrating citrus production into the farming system

The citrus crop must be combined well with other enterprises so that they complement each other.

Raising citrus rootstocks

1. Select seeds

- Choose seeds from healthy and vigorously growing mother trees.
- Squeeze out the seeds and soak them in warm water at 55 ºC for 10 minutes.

2. Sow seeds

- Sow the seeds immediately in seed-beds, mixed with well-prepared compost.

3. Transplant seedlings

- Prick the seedlings into polybags when they have 2 pairs of leaves and a bud.

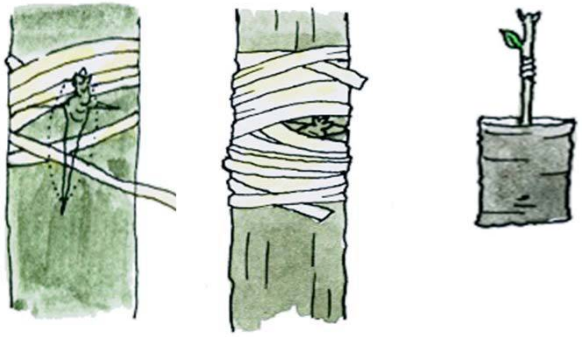
Budding

1. Select healthy trees from which to obtain bud graft branches

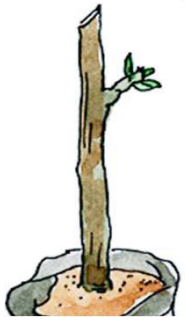
2. Gently slice the bud together with the bark form the bud stick

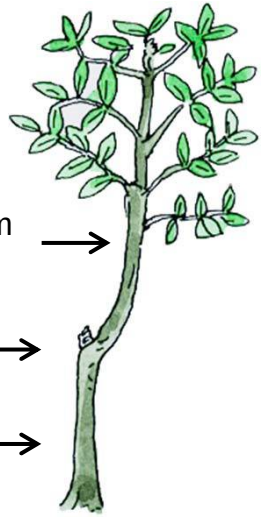
3. Make a 1½-inch cut in the shape of a "T" into the bark

4. Insert the bud under the "T" slice and wrap with a budding tape

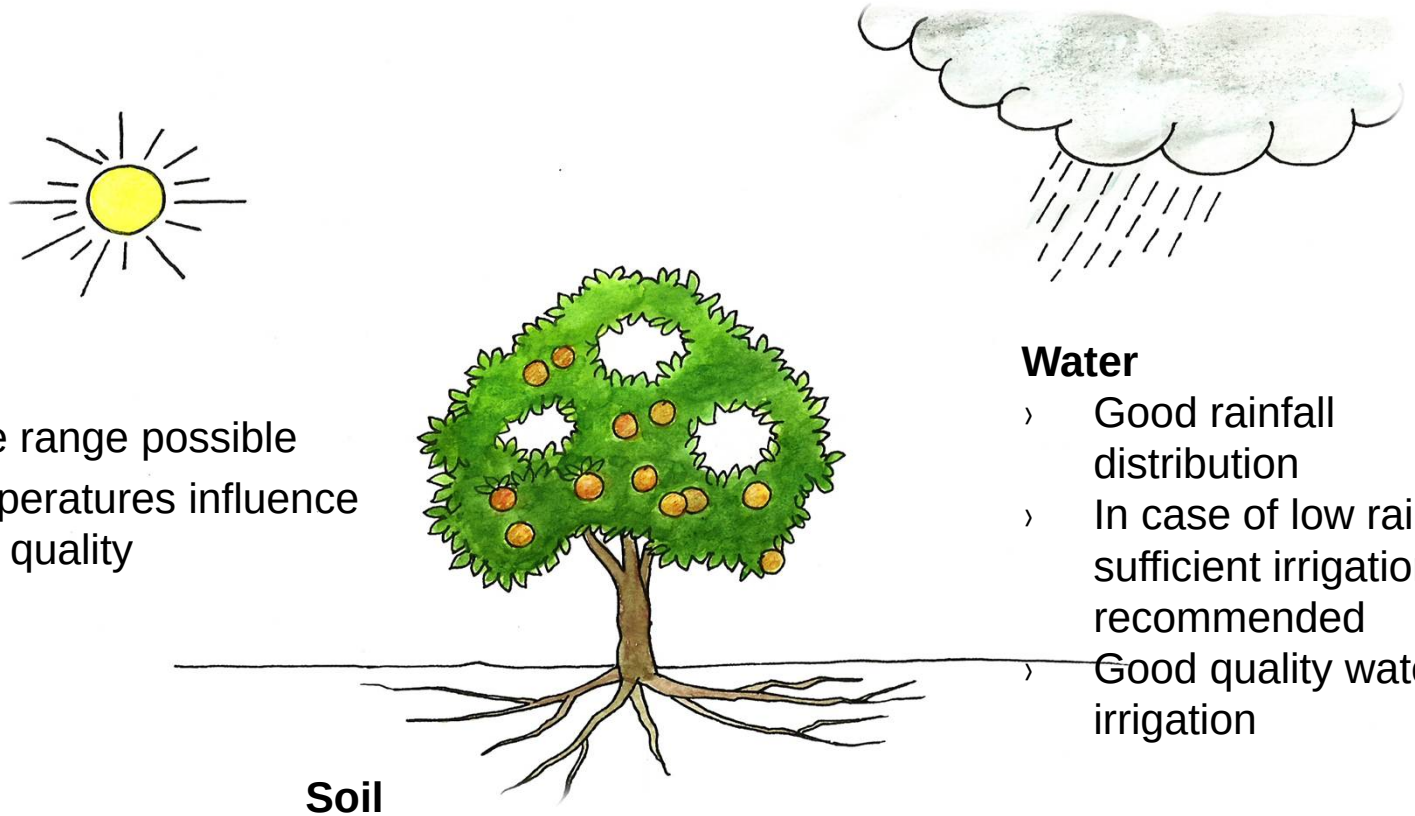


5. Remove the budding tape when the buds start sprouting





Agroecological requirements of citrus



Climate

- Wide range possible
- Temperatures influence juice quality

Water

- Good rainfall distribution
- In case of low rainfall, sufficient irrigation is recommended
- Good quality water for irrigation

Soil

- Wide spectrum possible
- Good drainage required
- Deep rooting zone
- Good biological activity

Planting of citrus seedlings

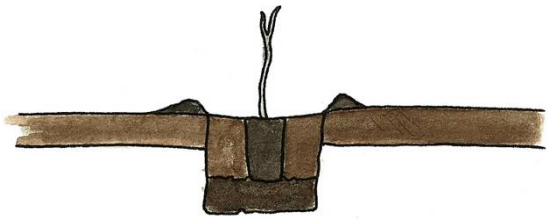
1. Dig a hole

2. Add topsoil and compost to the bottom

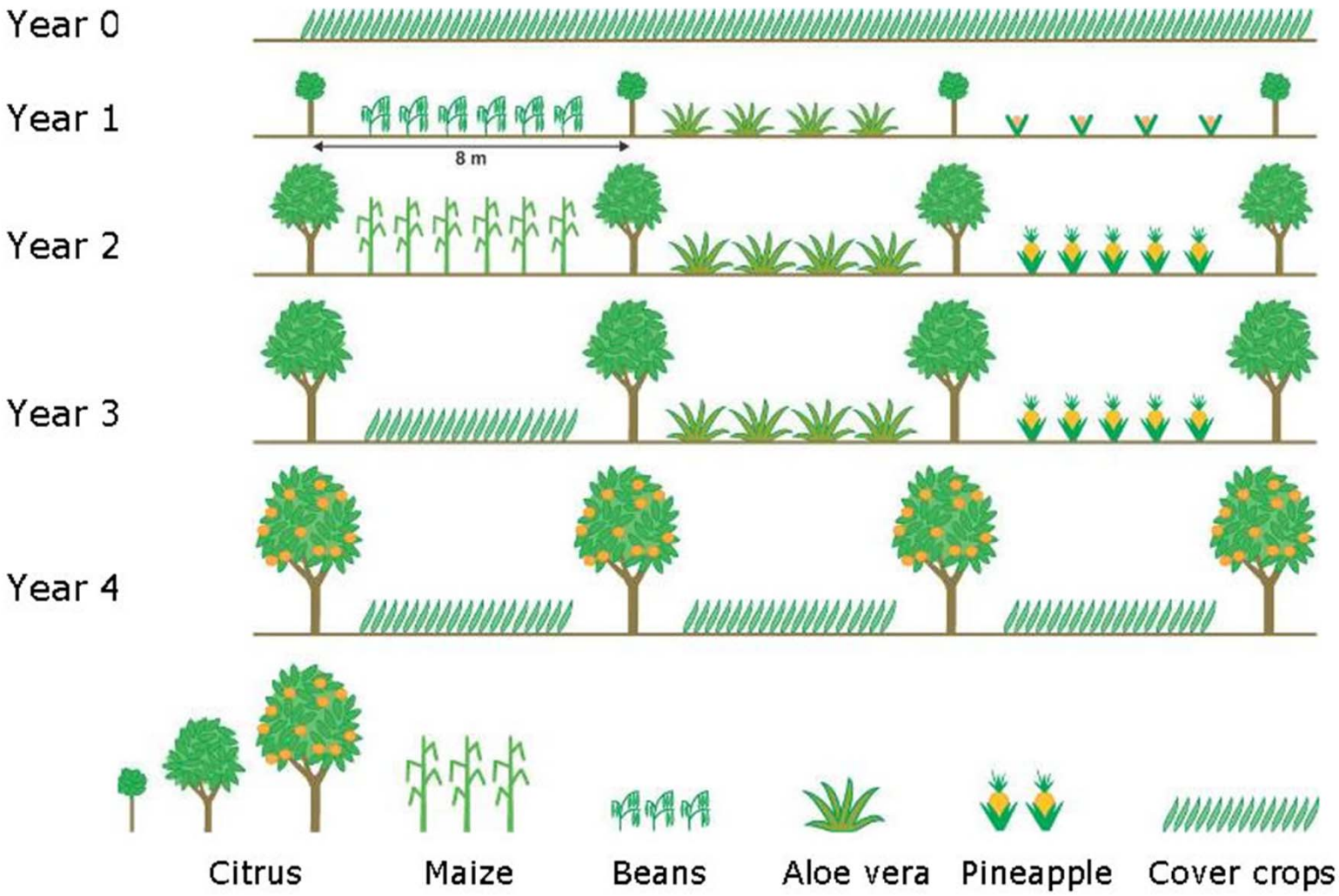
3. Place the tree into the hole and fill the hole with a mixture of topsoil and compost

4. Water the plant well

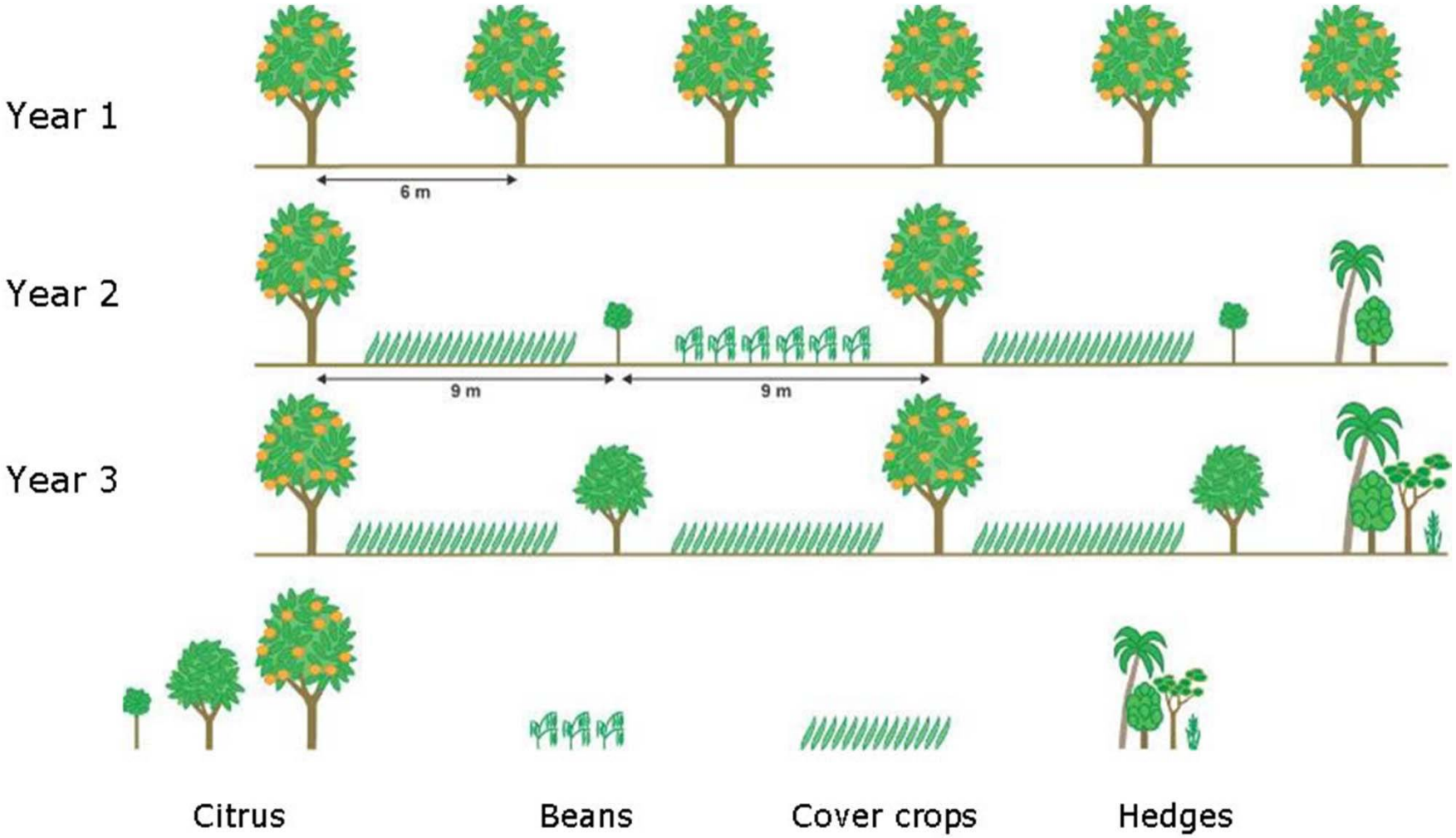
5. Build an earth wall around the seedling



Establishing a new organic citrus orchard

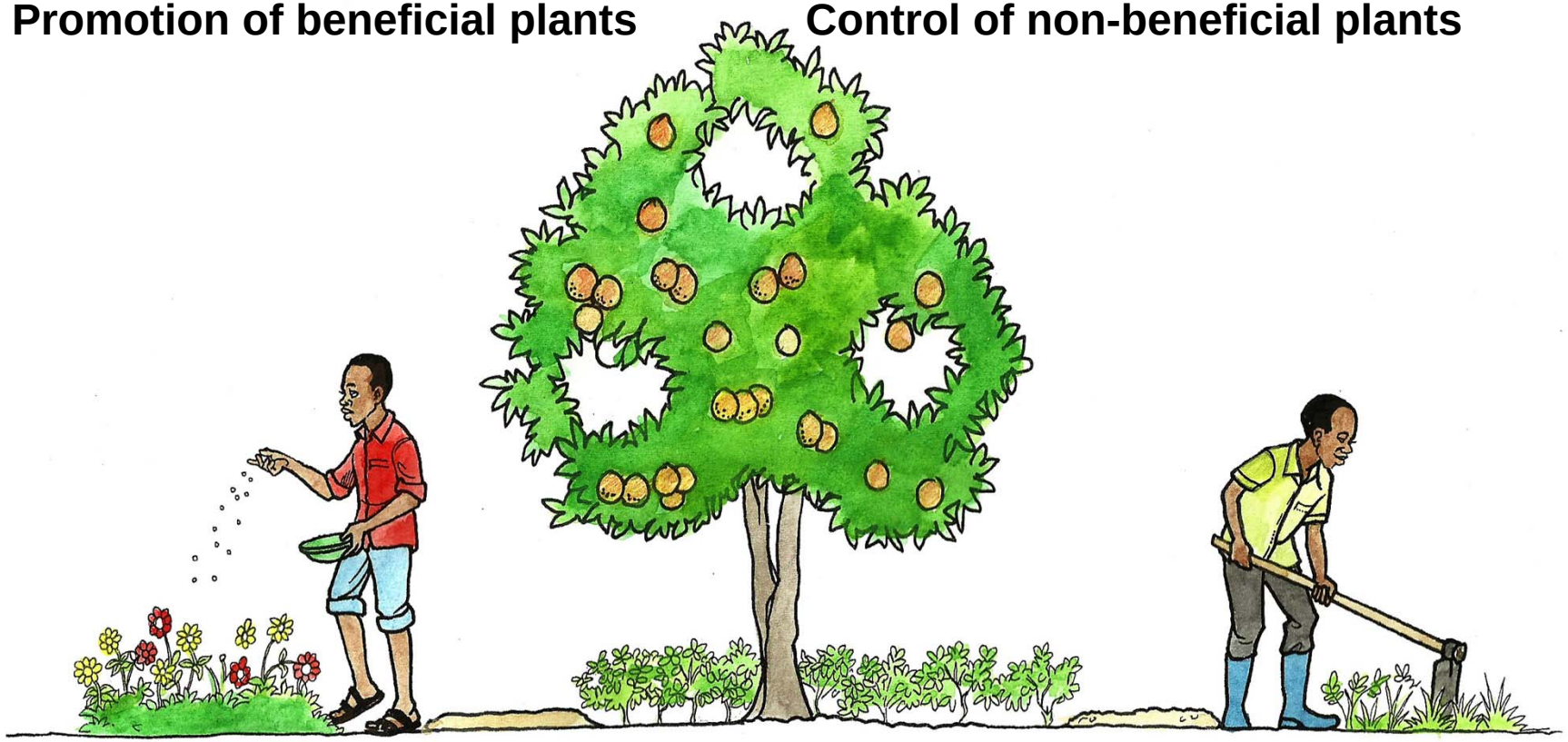


Improving an existing citrus orchard



Increasing biodiversity in citrus orchard

Promotion of beneficial plants **Control of non-beneficial plants**

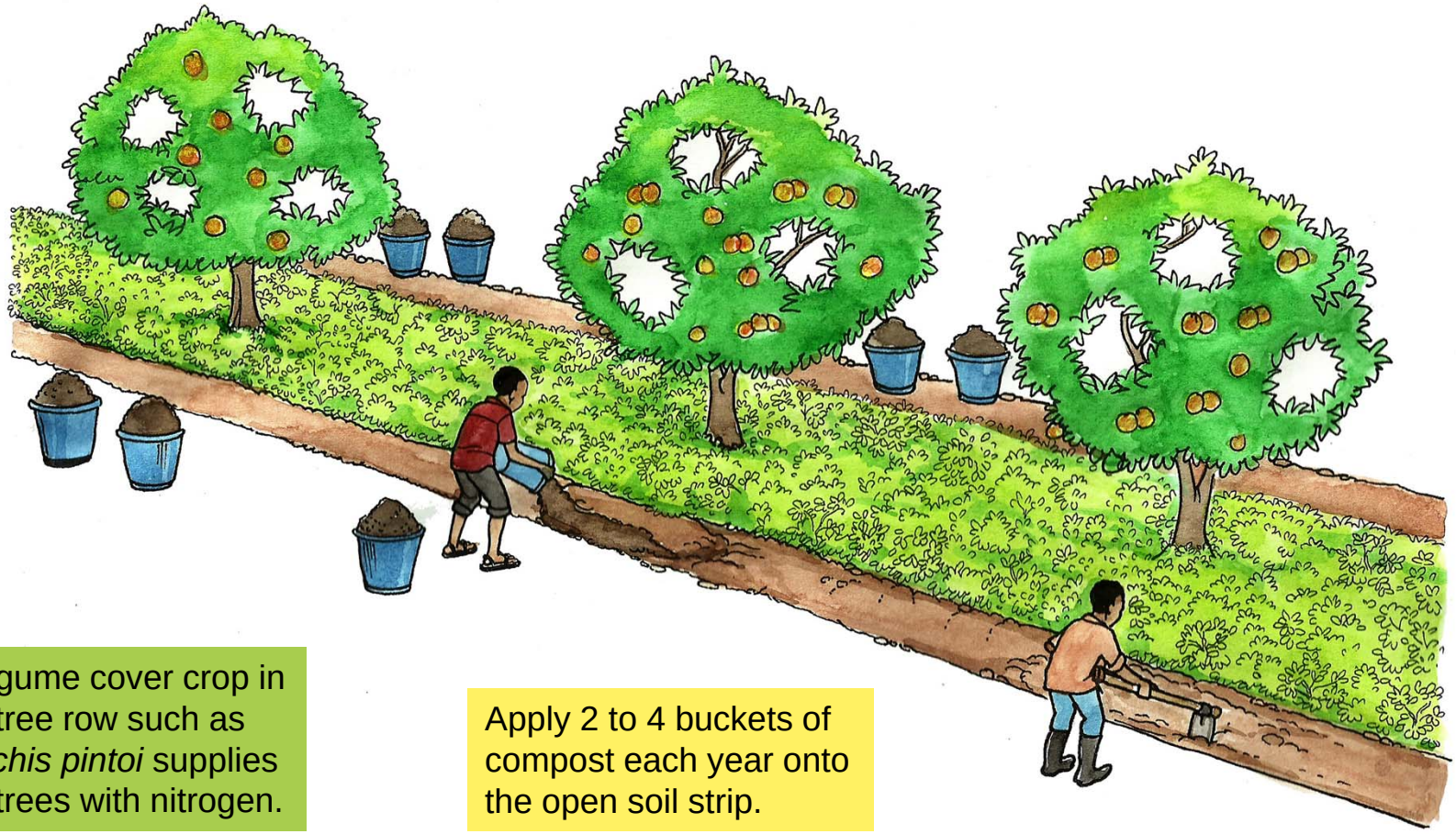


Promote beneficial plants such as leguminous crops and beneficial herbs.

Control non-beneficial plants such as aggressive grasses and twinning plants.

Improving soil fertility in citrus orchards

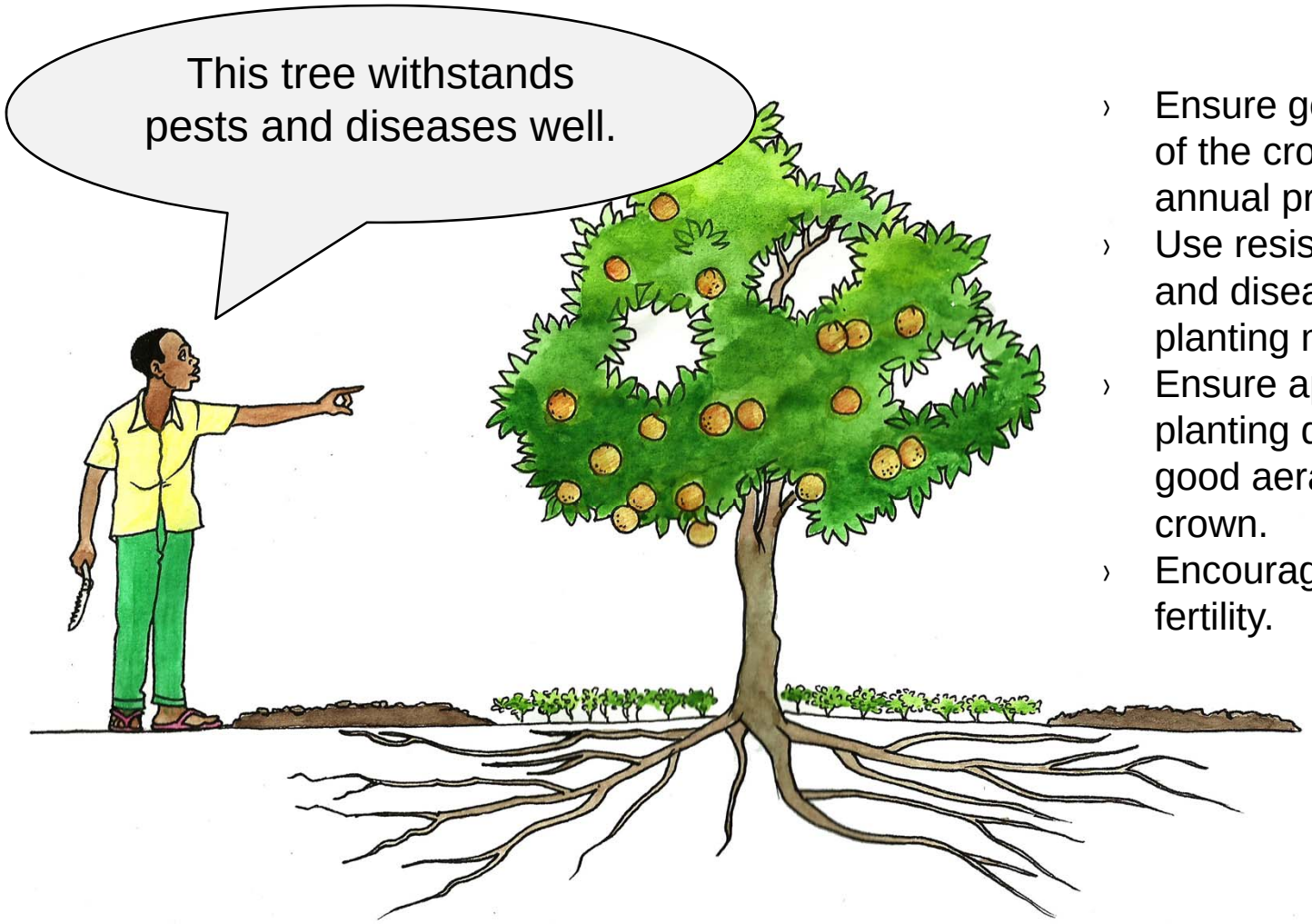
A biologically active soil is the foundation for successful citrus production.



A legume cover crop in the tree row such as *Arachis pintoi* supplies the trees with nitrogen.

Apply 2 to 4 buckets of compost each year onto the open soil strip.

How to promote healthy citrus trees



- Ensure good aeration of the crown through annual pruning.
- Use resistant varieties and disease-free planting material.
- Ensure appropriate planting distance for good aeration of the crown.
- Encourage good soil fertility.

Major citrus pests

Pest	Preventive measures	Direct control
Leaf miner *(Phyllocnistis citrella)* Attacks young leaves and shoots.	› Promote diversity to encourage natural enemies around and within the orchard.	› Apply neem sprays around young leaves and shoots.
Aphids (*Toxoptera citricidus* and *T. aurantii*) Important vector of the *Citrus tristeza* virus	› Encourage natural enemies such as ladybird beetles, lacewings, hoverflies and parasitic wasps.	› Apply neem sprays around the aphid populations, especially around new shoots and under the leaves.
Scales Excrete honeydew causing growth of sooty mould, usually associated with ants.	› Encourage natural enemies as scales are attacked by a wide range of parasitic wasps and predators.	› Apply botanical sprays to target young stages of the scales. › Remove heavily affected branches and leaves.

Major citrus diseases

Disease	Preventive measures	Direct control
Damping off caused by the fungi *Rhizoctonia solani*, *Phytophthora* spp. or *Pythium* spp.	› Avoid planting in infected fields. › Treat seeds with hot water before planting. › Avoid over-watering of seedbeds. › Use a mixture of manure and sand as planting media.	› None possible
Greening disease transmitted by vector insects (*Diaphorina citri*) or infected plant material	› Control the vector using *Tamarixia radiata* or other natural enemies and predators such as *Cycloneda sanguinea*.	› Control the vector using neem, tephrosia or pyrethrum botanical mixtures. › Remove heavily infected trees.
Phaeoramularia fruit and leaf spot caused by the fungus *Phaeoramularia angolensis*	› Apply field hygiene by restricting movement of infected material and removal of all infected materials.	› Apply copper based products (Bordeaux mixture or copper oxychloride).
Citrus tristeza virus (CTV) transmitted by the aphid *Toxoptera citricidus*	› Avoid sour orange rootstock. › Use CTV-free budwood. › Control vectors like *T. itricidus.*	› Remove infected trees.

How to manage water efficiently

- Increase water retention capacity of the soil by ensuring a high level of organic matter and permanent soil cover. This will reduce the need for irrigation.
- Use water-saving drip irrigation. This will result in economical use of water.
- Use good quality irrigation water only.

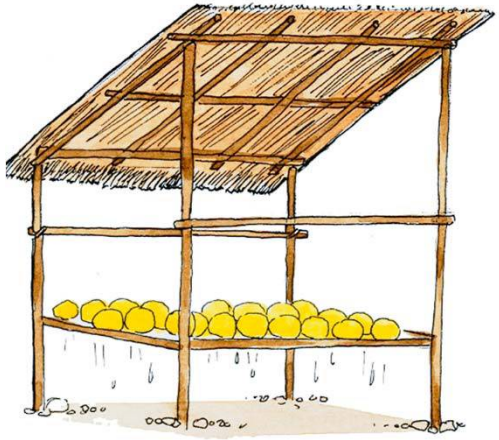
Postharvest handling of citrus

1. Ensure timely harvesting

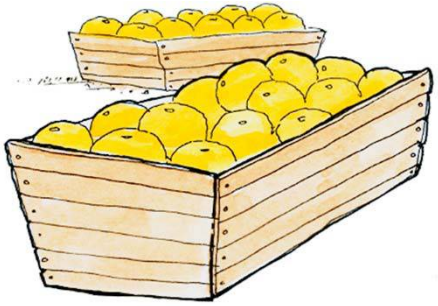
Citrus should be picked ripe because it does not continue to ripen after harvest.

2. Wash fruits with a mild detergent and clean water

3. Drip to dry under shade



4. Pack and store well



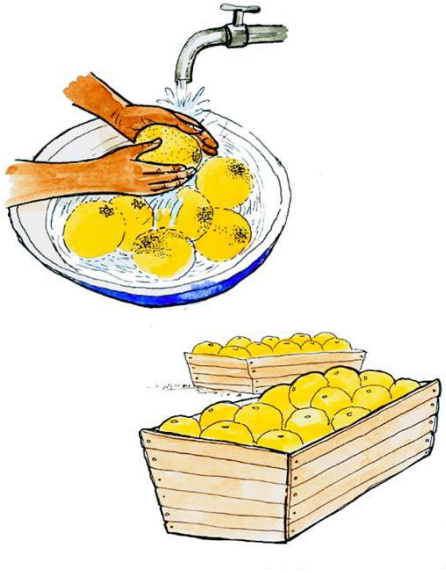
Avoid high humidity conditions in order to control blue and green mould.

Marketing and certification of citrus production

1. Apply organic production methods

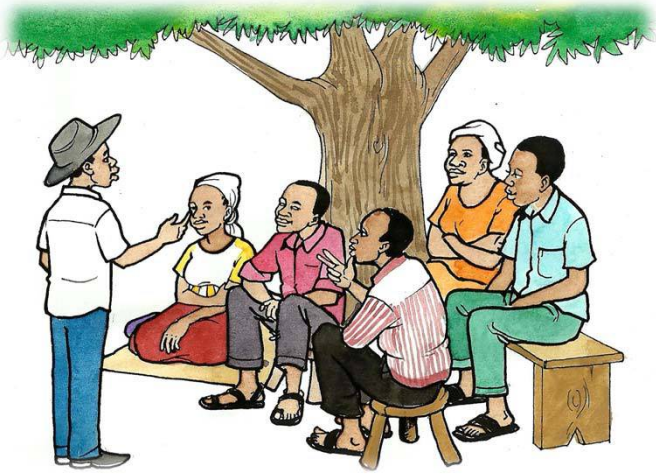
- Use organic fertilizers only.

2. Proper post harvest handling



- Do not use synthetic substances to preserve citrus fruits.

3. Certification



- Only as a market requirement
- Find markets for citrus and other farm products too.
- Cooperate with other farmers to ensure volumes and continuity.