Agro-Facts

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CROPS

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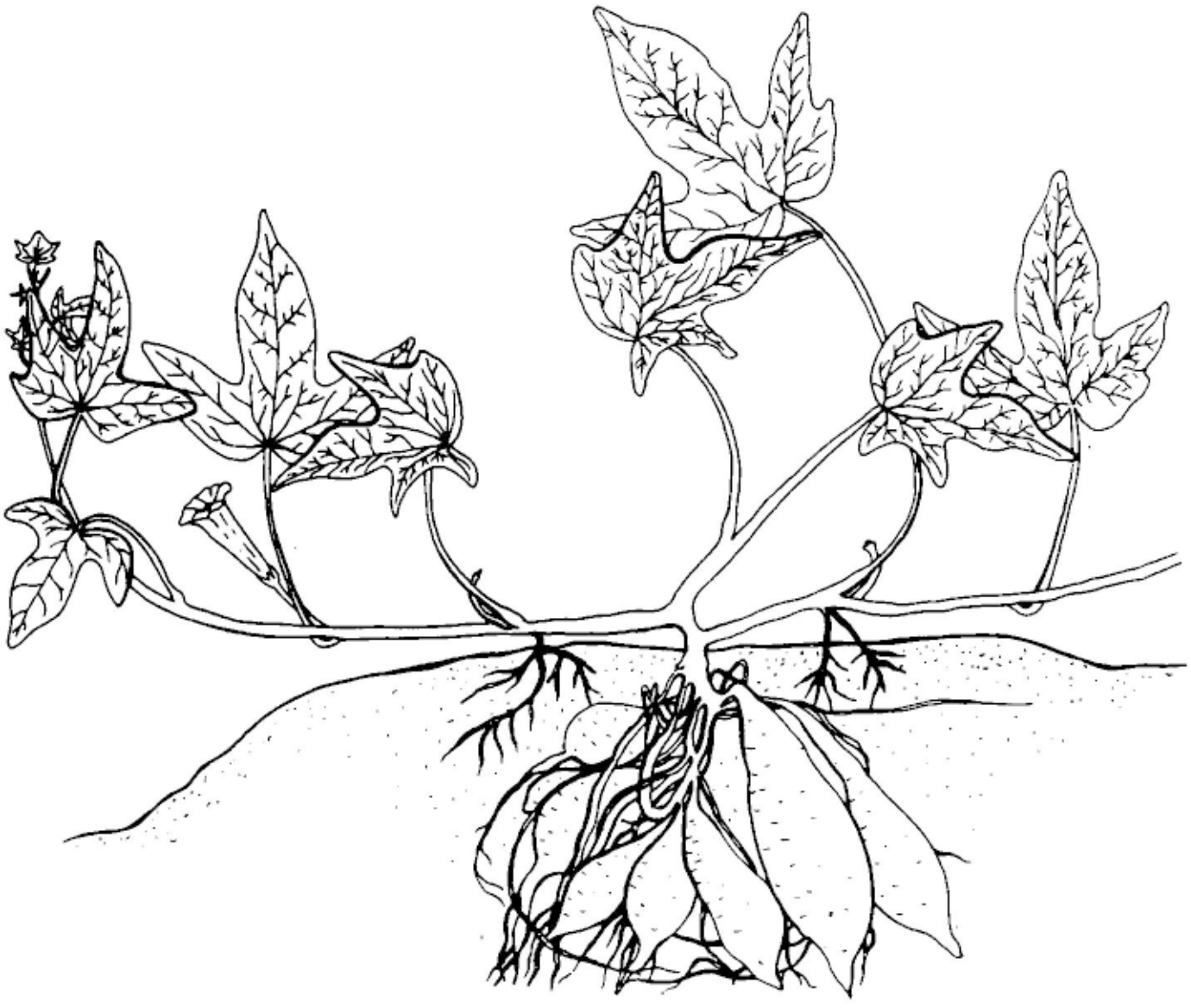
Sweet Potato (*Ipomoea batatas)* Planting Material



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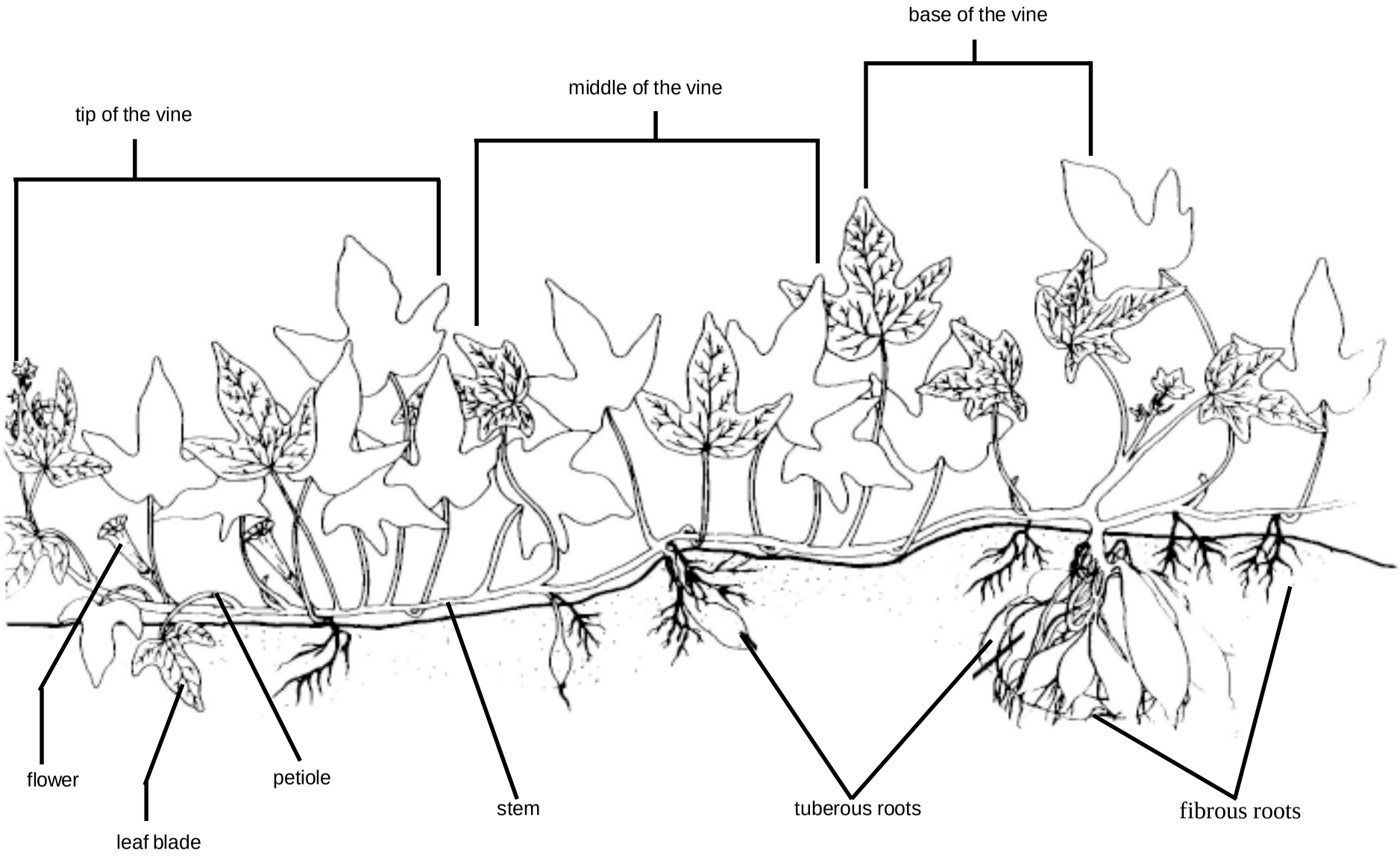


Parts of the sweet potato plant

SWEET POTATO
PLANTING MATERIAL

A high-yielding crop of sweet potato (*Ipomoea batatas*) begins with good planting material.

To select good planting material, the grower must consider:

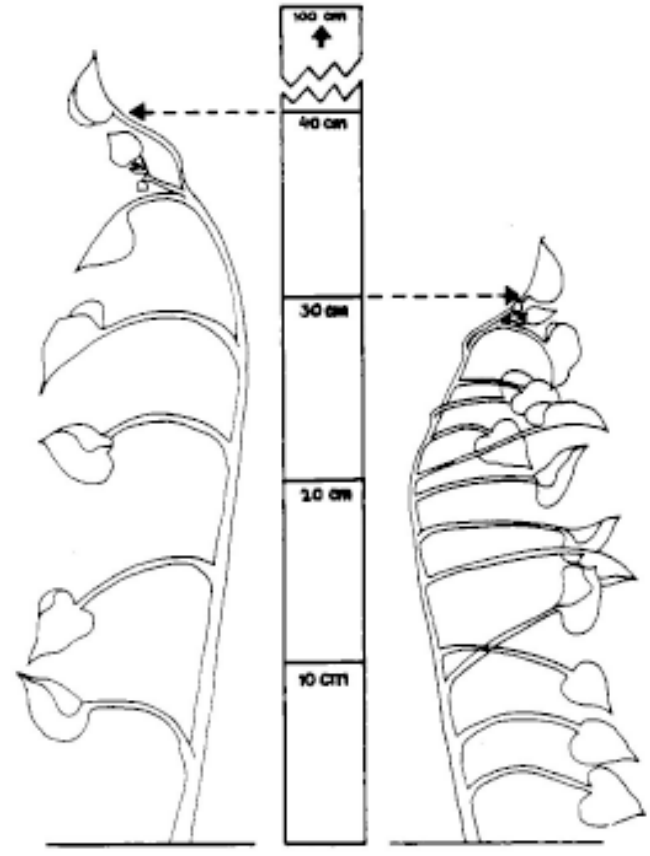
- TYPE of planting material,
- LENGTH of planting material,
- AGE of planting material, and
- HEALTH of planting material.

Type of Planting Material

Farmers propagate sweet potato vegetatively, using vine cuttings. Cuttings from the TIPS of the vine are the best planting material. Cuttings from the MIDDLES and the BASES of the vine can be used, but they usually produce lower yields. Also, cuttings from the BASES of the vine more often carry weevils.

Plant healthy vine tip cuttings.

Length of Planting Material



long internodes short internodes

Long vine cuttings tend to produce higher yields than short ones, but generally cuttings 30 to 40 cm (12 to 16 inches) long are recommended.

If the internodes (distances between leaves) are SHORT or AVERAGE, use cuttings that are 30 cm long. If the internodes are LONG, cuttings should be about 40 cm long.

Plant vine tip cuttings which are 30 to 40 cm (12 to 16 inches) long.

Age of Planting Material

Generally, vine cuttings taken from YOUNG plants produce higher yields than cuttings taken from OLD plants. YOUNG plants are 2 to 3 months of age; OLD plants are 4 to 5 months of age or older.

Table 1 shows you the results of one trial comparing vine cuttings taken from plants of different ages. In most cases, cuttings taken from 4-month-old plants yielded less than cuttings taken from 2- and 3-month-old plants. This happens because OLD plants are putting most of their energy into tuber production, and therefore their vine tips are weak and growing slowly. In contrast, vine tips of YOUNG plants are vigourous and growing rapidly. Also, they are usually healthier, with less disease and fewer weevils.

Many farmers worry that they will reduce the yields of the plants from which they take cuttings, and therefore they wait to take their vine cuttings from old plants just before harvest. It is true that if you take MANY cuttings from a young plant, you will reduce its yield. But you will not reduce yields if you take only one or two cuttings from each young plant.

Table 1. Effect of the age of vine cuttings used as planting material on the total yield of 4 sweet potato cultivars (adapted from F.W. Martin's "Effect of age of planting material on-yields of sweet potato from cuttings", Tropical Root and Tuber Crops Newsletter 15:22-25, 1984).

Age of cutting (months)	Cultivars (Varieties)				Means for ages
	Gem	Miguela	Chipper	Bonara	
	Tuber Weight Per Plant (kg)				
2	1.67 a1	0.51 ab	1.08 a	1.38 a	1.16 a
3	1.65 a	0.62 a	1.10 a	1. 38 a	1.19 a
4	1.62 a	0.43 b	0.66 b	1.05 b	0.94 b

[1]Means in columns followed by the same letter are not significantly different (p=0.05).

Health of Planting Material

To produce higher yields and reduce the spread of diseases and weevils from old fields to new fields:

- Take planting material from healthy plants.

- Treat planting material with chemicals.

Planting material should be taken ONLY from HEALTHY plants. This means you should not take vine cuttings from plants that show symptoms of Leaf Scab and LITTLE LEAF DISEASE or from plants with VIRUS symptoms.

Also, to avoid carrying sweet potato WEEVILS to your new field, you must be careful that your vine cuttings do not contain weevil eggs, larvae, and pupae. Cuttings from vine TIPS are less likely to carry weevils than cuttings from the middle and base.

If farmers cannot find planting material that is free from Leaf Scab disease and weevils, they can treat with chemicals.

NOTE: about treating planting material with chemicals:

Treating planting material with chemical pesticides can help to control some diseases and pests. But before you recommend chemicals to farmers, consider the following:

1. Is it economical to treat with chemicals? Is the cost of the chemicals less than the value of the increased yield that the farmer will gain by using them?

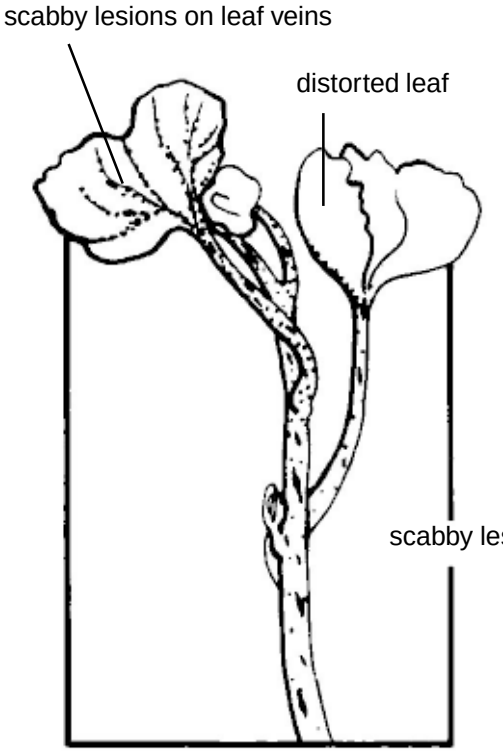
2. Generally, only commercial growers have the cash to purchase chemicals. Therefore, it is usually not appropriate to recommend chemicals to subsistence farmers.

3. Remember that farmers must handle these chemicals carefully. They must wear waterproof gloves and other protective equipment when mixing the chemicals, when dipping or soaking planting material, and when handling and planting the cuttings after they have been treated. Farmers should mix only enough chemical to do the job, and should throw away the extra chemical in a safe place, not near water, houses or animals.

Leaf Scab Disease

Do not plant cuttings infected with Leaf Scab disease.

When a plant is infected with Leaf Scab (*Elsinoe batatas)*, there are small, brown, scabby lesions or spots on the leaves. These lesions are on the midrib and veins on the underside of the leaf blade, and on the petioles. Leaves become distorted and twisted, and they often look silver-colored from a distance. The scabby lesions are also found on the stems. If Leaf Scab is severe, the vines are shorter than usual and the vine tips may be killed. There are no symptoms on the tubers, but yields may be severely reduced.



Avoid planting vine tip cuttings infected with Leaf Scab disease (*Elsinoe batatas*).

If farmers cannot find planting material which is free from LEAF SCAB disease, they

- treat infected cuttings with fungicide, or
- grow tuber sprouts.

Treating Infected Cuttings

Soaking planting material in a fungicide before planting can help to control Leaf Scab. In the Pacific, benomyl (Benlate) or mancozeb (Manzate 200, Mancozeb) are usually recommended, if legal. For instance, in one country the following is recommended: just before planting, soak cuttings for 15 minutes in a solution of mancozeb 80% WP (3 gm/litre of water). Ask your Extension Division for the recommendation in your country.

Growing Tuber Sprouts

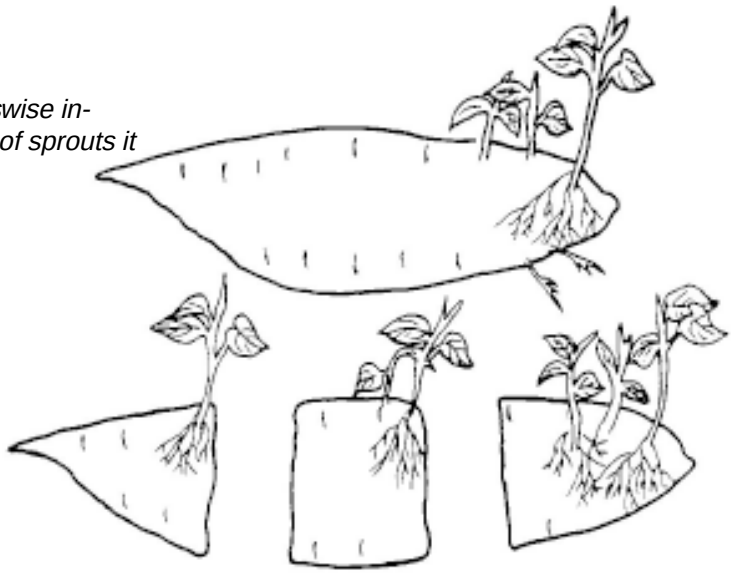
You can grow Leaf Scab free tuber sprouts to use as planting material instead of vine cuttings. Tuber sprouts can be grown by planting tubers in a nursery bed. For the nursery bed, choose a location with well-drained soil, where sweet potatoes have never been grown before. The nursery bed should also be far away from other sweet potato fields and from the drainage water off sweet potato fields, so that Leaf Scab will not spread to it.
At harvest, select tubers from plants that show no symptoms of Little Leaf disease or viruses. Before planting these tubers in the nursery bed, carefully wash them or disinfect them by soaking for 5 to 20 minutes in a solution containing 20% Clorox (or other household bleach containing SODIUM HYPOCHLORITE). This soak will destroy any Leaf Scab spores carried on the OUTSIDE of the tuber. Leaf Scab disease is not carried INSIDE the tuber.

Plant the tubers in the nursery bed, close together but not touching. Cover them with about 5 cm of soil and a layer of mulch to retain moisture, but do not use sweet potato vines for mulch. Water as necessary to keep the soil moist but NOT wet.

When the tuber sprouts have grown 40 to 50 cm long (1 to 3 months after bedding), cut them off just above the soil surface and use for planting.

NOTE: You can increase the number of sprouts produced by each tuber by cutting the tubers crosswise into 2 or 3 sections as in the sketch below. This increases the number of sprouts produced by one tuber. To avoid spreading virus diseases, disinfect cutting knives by washing frequently in soapy water, milk or a 3% solution of trisodium orthophosphate. Cutting should be done BEFORE tubers are dipped into the bleach

Cutting a tuber crosswise increases the number of sprouts it will produce.



NOTE: Tuber sprouts are difficult to grow if the tubers are infected with Little Leaf disease or viruses. Unlike Leaf Scab, Little Leaf disease and viruses can be carried INSIDE the tuber.

Little Leaf Disease

Carefully select planting material which does not show symptoms of Little Leaf disease.

The symptoms of Little Leaf disease are as follows: Leaves become much smaller than normal, and in some cultivars, leaves are more round than normal. Leaves may be yellowish. Stems are short and they grow erect instead of creeping on the ground. The infected vine looks "bushy" because the internodes are very short and there are many branches. Infected plants produce a mass of roots which are short, thin, and branched. Infected plants produce very few or no tubers. Sometimes only one or two branches on a plant show symptoms of Little Leaf disease, and the rest of the branches on the same plant look healthy. But these healthy looking branches may also carry the disease, and you should NOT use them for planting material.

There are NO chemicals that will clean up planting material infected with Little Leaf disease.

Virus Disease

In the Pacific there are several virus diseases which are difficult to identify. Avoid harvesting planting material from weak plants or from plants with mottled leaves or leaves with other color changes that are not typical of the cultivar.

plant infected with Little Leaf disease

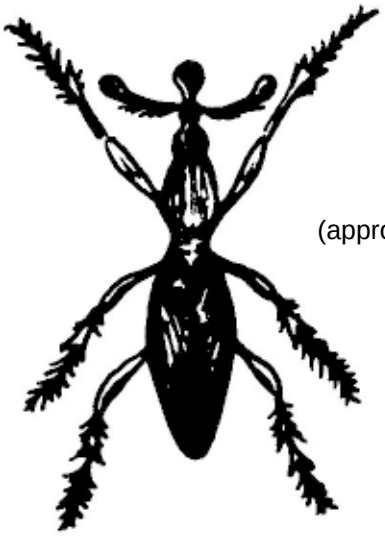
healthy plant

Do not harvest planting material from plants with Little Leaf disease.

Two types of sweet potato weevil attack sweet potatoes in the Pacific.

Weevil eggs, larvae and pupae can be carried in vine cuttings.

Eucepes postfasciatus
(approximately 10x larger than actual size)



Cylas formicarius
(approximately 10x larger than actual size)

It is best to take vine tip cuttings from fields with few weevils. If this is not possible and you can see that your cuttings are carrying weevil eggs and larvae, you can soak them in an insecticide solution just after cutting.

For example, in one Pacific country the following is recommended: immediately after harvesting, soak cuttings for 20 minutes in a solution of diazinon 20% EC (3.5 ml/litre of water). Soak the cuttings for at least 20 minutes so that the insecticide can move inside the vine. Ask your Extension Division which insecticide, if any is recommended in your country.

Soaking Cuttings

NOTE: When you are soaking planting material in fungicide or insecticide, the entire cutting should be under the solution. Because sweet potato cuttings float, you must put a heavy object on top of the cuttings so all of them will stay under the solution.

REMINDER: Soaking cuttings in fungicide or insecticide will prevent carrying Leaf Scab disease and weevils to a new field, but it will NOT prevent later attack in the field. To prevent later attack, farmers must carry out additional control measures during the growing season such as rotation, planting resistant cultivars, and destroying infected vines soon after the harvest.

Wear waterproof gloves, respirator and protective clothing when soaking cuttings.

Hardening Cuttings

Vine cuttings can be planted immediately after cutting, or they can be HARDENED by keeping them damp in a SHADY place for 1 to 3 days. During this hardening time, roots will begin to grow on the cuttings, and the cuttings will become tougher and more resistant to the “shock” of planting.