MOST SERIOUS DISEASES IN SWEET POTATO

Viruses

Viruses are the most damaging group of disease organisms affecting sweet potato in Africa. Viruses are amongst the smallest organisms known and can only be seen using a very powerful electron microscope. They are very simple organisms and can only survive and multiply inside their hosts/victims. Most also need to be carried from plant to plant, usually by an insect which feeds on plant sap, such as aphids or whiteflies. Once a virus enters a cell in the body of its host, it will take over part of the management of the cell's processes, and force the cell to produce more viruses identical to itself – rather than the crop yield we want. These new virus particles then spread through the plant to infect more cells.

Common symptoms of virus infection in plants including sweet potato are:

- Diminished growth so the plants and leaves remain small (stunted)
- Chlorosis (paleness, even whitening; aidosoikit) of the leaf tissue. This chlorosis may be general or in a pattern, often either between the leaf veins in a mosaic or less well defined mottle, or along the veins to form a chlorotic network.
- Misshapen leaves with an uneven or curled appearance
- Pigmented leaves, often purple or yellow generally or in spots or rings
- Reduced production of sweet potato storage roots.

Viruses affecting sweet potato can be spread by the use of foliar cuttings taken from infected plants. They are also transmitted from plant to plant by sap-sucking aphid and whitefly insects.

Sweet potato feathery mottle virus (SPFMV) and Sweet potato chlorotic stunt virus (SPCSV) are together the most important viruses affecting sweet potato in Africa. By themselves, sweet potato viruses may cause only mild or no obvious symptoms. However, plants can be infected by more than
one type of virus and, when this happens, the viruses may help each other to multiply with the result that the disease is more severe than expected. The combination of SPCSV+SPFMV is known as sweet potato virus disease (SPVD) and is the most important disease of sweet potato in Africa. SPFMV is transmitted by a wide range if aphid species (*eiliana*) and is spread mainly by winged adults, even of species that do not colonise sweet potato, flying from plant to plant. SPCSV is transmitted by the mobile adult form of white flies (*ekwanga*), especially Bemisia tabaci, as they fly from plant to plant. Since it is the spread of SPCSV by white flies that synergises SPFMV, whiteflies are also usually the driving force behind the spread of SPVD. Neither disease is spread by insects over very long distances.

Because viruses spread quickly through the vascular system of a plant to infect the whole plant, any portions of an infected plant that are used as planting materials (vines or roots), are almost always diseased themselves. This then carries the disease to the next generation of plants.

So:

- **Make sure cuttings are collected for planting new sweet potato crops from healthy plants and if possible from healthy plants in crops in which few other plants have the disease.** Then there is also less chance of taking cuttings from plants that have just been infected. It may be better to avoid collecting cuttings from very old crops both because SPVD may have built up in these crops and because SPVD is less easy to see in old plants that in vigorously growing crops.

- **Remove and burn or feed to livestock any diseased plants as soon as they appear in young crops** (plants infected when young wouldn’t have yielded much anyway, the neighbouring plants will soon fill up the space and you can replant cuttings if you wish in young crops).

- **Avoid planting new crops where you grew sweet potato last season** because roots and cuttings from old diseased plants surviving in the soil will produce diseased plants from which infection will easily spread to your new crop.

- **Plant your new crop away from old crops** so it is difficult for whiteflies and aphids to reach your new crop. Other forms of crop hygiene such as ensuring that the vines and leaves from harvested crops are completely destroyed (they can be fed to livestock) and that all the roots (especially the small ones which may come from diseased plants), are destroyed.

However, often the best and certainly the most convenient means of controlling SPVD is to plant varieties of sweet potato which have resistance to virus diseases.

All these management practices work better if they are done on areas as large as possible, so if communities can work together to manage SPVD they will all benefit. The crop hygiene you do to control sweet potato viruses probably also helps control other pests and diseases.
Fungal Pathogens causing diseases of the leaves and vines

**Alternaria**

The fungus survives in the soil and in plant remains. The airborne spores are spread through: infected planting material; wind; splashing rain and water. During the rains the increased humidity often leads to high levels of infection. The disease incidence and lesion (iboconoreta) size increase in wetter, high altitude areas.

The disease is first observed as small, brown/grey/black oval lesions with a typical bulls’ eye appearance of concentric rings, on leaves, stems and petioles. On the lower side of the leaf, blackened veins are observed. As the disease progresses, the lesions become necrotic usually surrounded by a wide yellow halo; soon after the whole blade turns chlorotic and drops. Vine bases and middle sections are more affected than tips. Death of vines can occur. The ground under affected vines is often covered with blackened leaf debris.

Good sanitation practices are the main management strategies for this disease: infected crop material should be destroyed and burnt, clean planting materials used and new crops of sweet potato should not be planted in fields which have recently had a sweet potato crop grown in them. Some varieties of sweet potato are more susceptible to Alternaria disease than others; you could try planting different varieties to see which are more resistant. In other crops fungicides are used against Alternaria diseases; however there is no information about using fungicides to control the disease in sweet potato.

**Root rots**

Several fungi and bacteria cause root rots. Once rotting starts it cannot be stopped. Infected plants must be destroyed to prevent further spread of the disease. Planting material should not be obtained from fields where there are many rotten roots. Since the fungi and bacteria that cause root rots cab survive in the soil for along time, sweet potato should be planted in rotation with other crops in order to avoid a build-up of disease. Cuttings should be taken from vine sections that have not been in contact with the soil.
Black rot (Ceratocystis fimbriata) is a dry root caused by a fungus. Sunken grayish-black lesions/areas form on the surface of the storage root. A smell of alcohol like that of fermenting fruit is often present. In severe infections, yellowing, wilting, stunting and death of affected plants can occur. The disease can also be serious on young vines and adult plants. Infected vines develop black sunken necrotic lesions or cankers at the point of attachment to the mother root. Bacteria also cause root rots, disease transmission routes and management strategies are similar to those of black rot.

On storage roots, small brown lesions with black margins can be observed on the surface, but more frequently the rotting is internal with no signs of it outside. Affected tissue becomes watery. There is often a strange smell produced in infected tissues.

Reference