

There are many different viral diseases that are often characterised by the type of symptoms that they cause. They include streak, mosaic, ringspot and leaf curl viruses. All crops can be affected by viruses.

Symptoms

Viruses can be difficult to identify. The leaves and stems of plants may become discoloured with spots or streaks. Some viruses produce cankers on the plants. The leaves may become crinkled, reduced in size or blistered, which can affect the plant's ability to absorb light. Some viruses affect the way plants take up nutrients and the growth of the whole plant may be stunted. Fruits and seeds may ripen unevenly or be deformed or blemished and this can affect the yield of a plant.

Description of disease

Viruses live and reproduce in the cells of the host plants. They can be present in live and dead plant material. Viruses are too small to be seen with the naked eye or even an ordinary microscope. They multiply within the cells of the plant and sometimes cause the above symptoms.

Viruses are often spread between plants by sucking insects such as aphids, leafminers, scale, white flies and thrips. Nematodes, fungi and soil dwelling insects can spread some viruses within the soil. The virus is spread when these pests feed on an infected plant then pass infected material in their mouths on to other plants when feeding on them.

If cuttings from infected plants are used for propagation, the new plants arising from them will also be infected. Some viruses may be carried in seeds from infected plants.

Viruses may also be transmitted through infected plant residue on hands or tools that have been in contact with diseased plants and then with healthy plants.

Prevention and control

Viruses can be very difficult to control once they are present. Observing some of the following measures will reduce the chances of crops being infected.

Healthy plants: Only take seeds and cuttings from healthy plants. Always plant new crops from healthy seeds or cuttings. Where possible plant crops using seed that is certified as being virus free. Dip cuttings in a mixture of wood ash and water to help prevent diseases.

Some plant varieties are resistant or immune to viruses. Although some modern varieties may be resistant to specific diseases, they may not be

suited to local conditions. Recommended local varieties can be resistant to disease and suited to local conditions.

Hygiene: Wash hands and tools thoroughly in clean water after they have had contact with diseased plant material.

Pest control: Control of the insects, nematodes and fungi that spread the viruses will help to prevent crops becoming infected. Contact HDRA for more information on the control of specific pests.

Weeding: Weeds are a good cover when the soil is not being cropped, but some weeds carry viruses that can be spread to crops. Regular weeding during cropping can help prevent the spread of viruses.

Healthy soil: Keep the soil healthy by adding compost and mulch and minimise soil disturbance. This will encourage the natural predators of nematodes and fungi that can carry viruses within the soil.

Removal of infected plants: Check your crops regularly for signs of virus infections. If any plants do become infected with a virus remove the plants and destroy them. Hot composting infected plants will destroy the virus. Contact HDRA for more information about composting.

Treatments

These treatments may help to prevent virus attack if used before plants have become infected by a virus.

Compost: Mix one shovelful of well rotted compost with 20 litres of water. Leave to stand for at least three days. Spray onto young plants once a week. Crops must be washed well with clean water before being eaten.

Urine: Spray healthy plants with a mixture of one part urine (human or animal) and one part water. Crops must be washed well with clean water before being eaten.

Milk: To help prevent tomato, tobacco and sugar cane mosaic virus mix one litre of milk with 10 – 15 litres of water. Spray the crops every 10 days.

Red pepper (*Capsicum annuum*, *C. frutescens*): Chop 100 grams of ripe, uninfected peppers and place in one litre of water for 24 hours. Filter out the peppers and add 5 litres of soapy water. Spray this onto plants to prevent tomato mosaic virus and tobacco spot virus.

Asthma weed (*Euphorbia hirta*): Crush the leaves and mix with water. Spray onto the plants.

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Snow berry (*Securinega virosa*): Crush the leaves and mix with water.
Spray onto the plants.

Produced by the Tropical Advisory Service, October 2002

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