# Major diseases of vegetables

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## Introduction

The cultivation of vegetables is subjected to the ravages of various plant pathogens such as fungi, bacteria and viruses. These plant pathogens are agents that cause diseases.

Our warm and humid environments are conducive for development of a large numbers of diseases. Continuous cropping and poor agronomic practices also contribute to disease development.

Diseased vegetables are frequently expressed by development and production of symptoms. Some common symptoms on specific parts of plants include wilting, discoloration, spotting, distortion, swelling, stunting, elongation or rotting of either leaves, stems, fruits or roots.

## Disease symptoms

### Crucifers (Leafy vegetables)

**Black rot** is one of the most serious disease of crucifers. It is caused by the bacteria, *Xanthomonas campestris* pv. c*ampestris*. The initial symptom is yellow V-shaped lesions with a blackening of veins; usually develop around the leaf margin. As lesions enlarge, leaf tissues turn brown and dry out.

Leaf symptoms of black rot

**Leaf blight** inflicted by the fungus, *Rhizoctonia solani* often occurs after a sudden change of weather, eg. sudden shower in the afternoon during a hot day. Infected leaves have patches of dull green or brown lesions which eventually dry out.

Symptoms of leaf blight

**Leaf rot** is caused by the fungus, *Choanephora cucurbitarium*. Infected tissues turn brown and lesions are covered with minute, hair-like greyish fungal fruiting bodies with pin-size black heads.

Symptoms of leaf rot

**Downy mildew** is caused by the fungus, *Peronospora brassicae*. The symptoms are irregular yellowish spots on the upper leaf surface with corresponding brown spots on the under surface. Under humid conditions, the under surface of leaf lesions are covered with white or grey mycelia and spores. Infected leaves eventually dry up.

Leaf symptoms of downy mildew

**Beans (Long bean and French bean)**

**Rust** is one of the most commonly found diseases. It is caused by *Uromyces appendiculatus*. The disease can affects leaves, stems and pods. The characteristic symptom is orange, rust-coloured spots with yellow halo of various sizes on infected plant parts. Affected leaves turn yellow and drop.

Leaf symptoms of rust

**Anthranose** is an important disease affecting aerial plant parts. It is caused by the fungus, *Colletotrichum lindemuthianum.* The most prominent symptom is on the pod; initially as rust-coloured spots but spreading to become elongated, deeply sunken, black lesions with reddish margin.

Symptoms of anthranose

**Fusarium wilt** caused by the soil-borne fungus *Fusarium oxysporum* is a devastating disease of many crops. Infected plants are stunted. Leaves gradually turn yellow and dry up, giving a wilting appearance. At the basal stem and roots, brown discolouration of vascular tissues can be observed.

Fusarium wilt affecting long bean plants

**Powdery mildew** is caused by the fungal pathogen from the *Erysiphacceae* family which include *Erysiphe and Oidium* species. The distinctive symptom is presence of white, powdery colonies on both leaf surfaces which extend to petioles and stems. Severely Infected leaves dry up, turn yellow and drop.

Leaf symptoms of powdery mildew

**Fruit vegetables (Tomato and Chilli)**

**Bacterial wilt** is a serious soil-borne disease of tomato and chilli. It is caused by the bacteria, *Ralstonia solanacearum. T*he initial symptoms is rapid wilting of leaves during the warmest part of the day followed by temporary recovery, in the evening or early morning. As disease progresses, a sudden, permanent wilt of the entire plant occurs. The lower stem and roots show a dark brown discoloration.

Bacterial wilt affecting tomato plant

**Cercospora leaf mould of tomato** is inflicted by the fungus, *Cercospora fuligena.* The symptoms are brown patches of fungal growth on the underside of leaves with the corresponding upper surface turning yellowish-brown. At later stage, lesions have a discoloured halo on both leaf surfaces. A similar velvety growth may occur on petioles and young succulent stems.

Symptoms of leaf mould

**Anthranose of chilli** is caused by *Collectotrichum* species. The initial symptom on fruit appears as small, water-soaked, sunken lesions that rapidly expand. Lesions turn brown to black and are covered with buff-coloured spore masses.

Anthranose affecting chilli fruit

## Disease management

Integrated management strategies should be adopted to control diseases. These are based upon prevention and containment of disease spread.

The best approach to disease prevention is by using disease-free seeds or planting disease-resistant varieties, if available. For example, varietal trials conducted at ARC have shown that certain chilli varieties such as New Comer, Madam and Long chilli were relatively tolerant to anthranose disease.

The practice of sanitation is one of the most important way to prevent diseases. Many infected plants are sources of disease infection as they harbour disease propogules that survive between growing seasons. The removal of infected plants and crop residues as soon as they are detected may reduce disease inoculum and slowing disease spread.

An old but practical control measure is crop rotation. Crop rotation is a practice where a crop planted in an area is replanted with an unrelated crop in the following season. Many diseases especially soil-borne diseases become a major problem when the same or related crops are grown in the same area each season. The avoidance of planting these crops in the same site successivelly reduce the chance of disease infection due to the absence of suitable hosts of same family having similar diseases.

Adequate fertilizer and water should be provided to promote good plant growth and to avoid plant stress. Healthy plant can better withstand certain disease infection. Good drainage and aeration are also vital as certain plant pathogens thrive well in water-logged soil or damp and humid environments.

Apart from the use of resistant varieties and cultural practices, the use of chemicals is another control method. To ensure efficient and safe use of chemicals, proper recommendations including the type of chemicals, rate of applications and preharvest intervals should be observed.