

attacked are rose, delphinium, sweet pea, and anemone. Powdery mildew is recognised by the white powdery appearance on the growing points of plants, on flower buds, and on young leaves. It can be controlled with sulphur sprays or dusts. Downy mildew appears as a fine, down-like growth on leaves and stems and is usually controlled with copper sprays. These are only a few of the more common fungous diseases occurring in most flower gardens.

**Virus**

A number of virus diseases attack many plants and are usually recognised by the way they discolour, dwarf, and distort. Once a virus disease has infected a plant it cannot be controlled or eradicated by spraying, for it inhabits the internal tissues. Care taken to eliminate the ways of spread will reduce the rate of infection. Some virus diseases can be spread by tools such as secateurs and knives, hands when handling infected plants, birds, and insects; others can be spread only by insects. Aphides are probably the greatest single agent assisting the spread of virus diseases. Therefore it is essential that this pest be eradicated whenever it appears in the garden.

Whenever a plant in the garden is known or even suspected of being infected with a virus disease, it should be destroyed by burning as soon as possible. Hands and tools should be washed in disinfectant before other healthy plants are handled.

Spotted wilt (*Lycopersicum virus 3*), whose hosts include anemone, calendula, cineraria, Iceland poppy, and

**CONTROL OF VIRUS**

Control: Remove and destroy infected plants by burning. Control sucking insects, especially aphides and thrips

Spotted wilt ..	Anemone, chrysanthemum, calendula, cineraria, dahlia, Iceland poppy, sweet pea, and zinnia
Cucumber mosaic ..	Aster, daphne, lily, pansy, polyanthus, and violet
Dahlia stunt ..	Dahlia
Daphne mosaic ..	Daphne
Iris mosaic ..	Iris
Narcissus and lily mosaic ..	Lily and narcissus
Tulip break ..	Tulip
Violet mosaic ..	Violet
Turnip mosaic ..	Stock and wallflower

**Precautions with H.E.T.P. and T.E.P.P.**

Particular care should be taken when the organic phosphorus insecticides H.E.T.P. (hexaethyl tetraphosphate) and T.E.P.P. (tetraethyl pyrophosphate) are being used. Gardeners should not eat, drink, or smoke when handling them and they should wash their hands thoroughly after spraying. The chief danger is from the concentrated material and every precaution should be taken to prevent it from coming in contact with the skin. If any is spilt on the hands, it should be washed off immediately. Empty containers should be disposed of by burying.

**FUNGOUS DISEASES AFFECTING THE FLOWER GARDEN, AND METHODS OF CONTROL**

Disease	Hosts	Control
Rust (several species)	Antirrhinum, anemone, cineraria, carnation, chrysanthemum, geranium, hollyhock, and rose .. .. .	Remove and destroy infected parts. Apply lime sulphur sprays
Powdery mildew ..	Anemone, cornflower, delphinium,	Remove and destroy infected parts. Apply lime sulphur plus colloidal sulphur sprays
Downy mildew ..	rose, and sweet pea .. ..	
	Antirrhinum and sweet pea ..	Spray with Bordeaux mixture, copper oxychloride, or thiram
Damping off wilt ..	Seedlings of many plants ..	Sterilise soil for use in boxes. Water infected areas with Cheshunt compound
Black spot .. ..	Rose .. .. .	Spray with Bordeaux mixture or copper oxychloride
Botrytis rot (several species) .. ..	Antirrhinum, lily, rose, and zinnia .. .. .	Remove and destroy infected plants. Spray with Bordeaux mixture, copper oxychloride, or thiram
Sclerotinia .. ..	Many flowering plants .. ..	Remove and destroy infected plants at first sign of infection; also remove soil with roots
Chrysanthemum mildew	Chrysanthemum .. .. .	Spray with lime sulphur plus colloidal sulphur
Smut .. .. .	Calendula and dahlia .. ..	Remove and destroy infected plants
Basal rot .. ..	Bulbs and corms .. .. .	Remove and destroy infected plants
Verticillium wilt ..	Aster, antirrhinum, dahlia, and stock; various shrubs ..	Remove and destroy infected plants
Fusarium wilt ..	Aster and carnation .. ..	Remove and destroy infected plants
Club root .. ..	Stock and wallflower .. ..	Remove and destroy infected plants, making certain of the roots
Silver leaf .. ..	Many trees and shrubs .. ..	Remove and destroy infected part or whole plant
<b>BACTERIAL DISEASES</b>		
Fireblight .. ..	Cotoneaster, hawthorn, japonica, and loquat .. .. .	Remove and destroy infected parts of plant
Crown gall .. ..	Japonica, prunus sp., and rose	Remove and destroy infected plants. Where possible, treat area with soil fumigant
Blast disease .. ..	Dahlia and rose .. .. .	Remove and destroy infected parts of plant. Spray with Bordeaux mixture
Bulb rot (yellow) ..	Hyacinth .. .. .	Destroy all infected bulbs

dahlia, is perhaps the most common virus disease in the flower garden. Its symptoms are small, brown spots appearing on young leaves with subsequent dwarfing and distortion. Another is cucumber mosaic (*Cucumis virus 1* which rarely kills its hosts, but causes a narrowing and distortion of the leaves and a generally unthrifty plant. Some hosts among flowering plants are daphne, aster, polyanthus, lily, and violet, but these are by no means all, as its host range is wide.

There are several virus diseases which are less known but nevertheless important in the flower garden, such as tobacco mosaic (*Nicotiana virus 1*), tulip break (*Tulipa virus 1*), turnip mosaic (*Brassica virus 1*), and dahlia stunt virus (unidentified). Control is by burning irrespective of the value of the plant; otherwise, apart from an unthrifty and sickly plant, a source of infection remains.

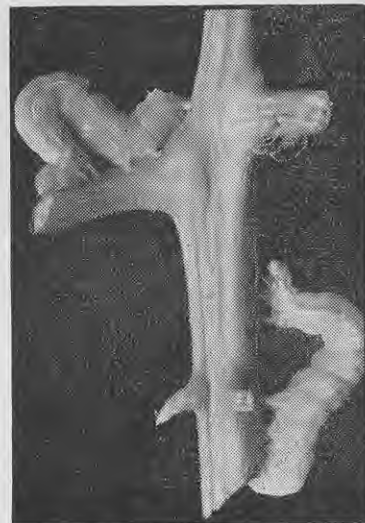
**Bacterial**

Not many bacterial diseases invade the flower garden, but those which do are of no less importance than those in the other two groups. The two most commonly found by the gardener are fireblight (*Erwinia amylovora*) which infests cotoneaster, loquat, and hawthorns, and crown gall (*Agrobacterium tumefaciens*), whose hosts are mainly rose, japonica, flowering cherry, and plum.

The symptoms of fireblight are leaves, flowers, and young shoots dying back and appearing as though scorched by fire. This condition may

appear on one branch or on several, weakening the plant as well as being unsightly.

Crown gall appears as gall-like growths on the roots and occasionally on the stems where the bacteria have invaded the plant tissues and multiplied, causing irregular cell growth. Parts of a plant infected with either of these bacterial diseases should be removed and burnt. Other bacterial



[Green and Hahn  
Looper caterpillars.