

PESTS AND DISEASES OF ROSES

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Many pests and diseases can affect roses but relatively few have serious consequences for the commercial grower.

INSECT PESTS OF ROSES

The two most important insect pests on roses are aphids and two-spotted spider mites. The rose grain aphid (*Metopolophium dirhodum*) is the aphid normally found on roses. It is very variable in colour, from pale green to pink. Large colonies of aphids can build up very quickly and if not controlled can seriously weaken the bushes. Infestations can start very early following mild winters and aphids were found on many crops in February this year (1990). The specific short term aphicide, pirimicarb, will give control and is a good choice environmentally. However, many growers still prefer to use the broader spectrum and more persistent organophosphates or pyrethroid insecticides.

In most seasons the two-spotted spider mite (*Tetranychus urticae*) is not a serious problem on field-grown roses. However, in hot summers and on container-grown and glasshouse roses it can cause serious damage. Growers need to be aware of the characteristic signs of damage such as speckling and leaf bronzing and to use acaricides if necessary. Acaricides that are available are all contact-acting materials that require high volume penetrating sprays on both the upper and lower leaf surfaces. All too frequently poor control may be blamed on resistance when the real cause is poor spray application.

Of the other pests that affect roses, leaf webbing caterpillars (*Tortrix* spp.) can often be found but rarely justify spraying. Free-living soil eelworms (*Pratylenchus*, *Longidorus*, and *Xiphinema* spp.) can cause damage on glasshouse roses but are not significant as field pests under normal circumstances in Britain. However, when crops are grown on very close rotations, especially on light soils, numbers can build up to damaging levels. *Xiphinema* can also spread the virus diseases, strawberry latent ringspot, and Arabis mosaic.

DISEASES OF ROSES

The three most important diseases of roses affecting the commercial grower and the general gardening public alike are

rose rust, powdery mildew, and black spot. Routine fungicide programmes are applied to rootstocks mainly to control rose rust and mildew and to the maiden bushes to control all three diseases. The problems these diseases cause in gardens has been one of the factors involved in the decline in popularity of roses in Britain.

Rose Rust is caused by species of the fungus, *Phragmidium*. The most common species found in the UK are *P. mucronatum* and *P. tuberculatum*. Rust infection can have a number of different effects.

i) Infection in the rootstocks can cause early defoliation which may affect bud “take”, reduce growth of the rootstock, and can affect grade-out of the maiden bushes in the following season.

ii) Infection in the maiden bushes seriously reduces grade-out.

iii) Some susceptible rose cultivars such as ‘Blue Moon’, ‘Pink Peace’, ‘Queen Elizabeth’, and ‘Picadilly’ develop stem cankers that can even kill the bushes.

Rust spores are spread by wind and infect leaves through stomata. Optimum temperatures are 18 to 21 ° C and continuous moisture for two to four hours is required for establishment of infection. The pustules are orange in colour in spring and summer but in autumn the black overwintering pustules develop.

Routine fungicide spraying for rust normally starts in early June and continues at 10 to 14 day intervals until autumn. The fungicides oxycarboxin, benodanil, or myclobutanil can all give good control.

Powdery Mildew is caused by the fungus, *Spaerotheca pannosa* var. *rosae*. The disease is a worldwide problem but is present in many different races. The fungus attacks young leaves, flowers, and stems, giving disfigured growth and reduced vigour of the bushes. In commercial production it can also attack rootstocks but is normally a much more serious problem on the maiden bushes.

The disease can overwinter on infected buds and stems and on fallen leaf debris. The spores of the disease are spread by wind. Optimum conditions for infection are warm nights with 90% R.H. or more, and day temperatures of 20 to 25 ° C with 40 to 70% R.H. The normal life cycle is usually completed in seven days but, exceptionally, can be as short as three days.

Routine spraying at 10 day intervals with fungicides such as bupirimate, triforine, or myclobutanil will normally give an acceptable degree of control for the grower.

Black spot. The characteristic feathery edged spots all too commonly found on roses are caused by the fungus, *Diplocarpon rosae*. The disease also causes severe leaf yellowing and defoliation. Although black spotting on leaves is the most obvious effect it can also attack young stems. The disease overwinters in infected stems and buds and on fallen leaves. The spores are spread by watersplash on the expanding young leaves. The spores must be continuously

wet for at least seven hours for infection to occur. Development takes place most rapidly at 19 to 24° C and the life cycle can be completed in as little as 10 days. Warm, wet weather in August can trigger an epidemic.

As the disease is spread by water rather than wind the introduction of infected plants into rose beds is a significant factor in disease spread.

The fungicides, triforine or myclobutanil applied at 10-day intervals will give reasonable control of black spot.

Other Rose Diseases. There are many other diseases that can affect roses and some of these can cause significant losses on individual nurseries given circumstances which favour the disease. These include downy mildew, stem canker on *R. rugosa*, black mould, and virus diseases.

A) *Downy Mildew (Peronospora sparsa)* has become a much more serious problem on roses because of the increase in rose production in containers and in the use of micropropagated roses. It is very much a nursery disease and does not normally cause problems in the garden. Close plant spacing on container nurseries with localised high humidities and overhead irrigation provide ideal conditions for the disease. The symptoms on many cultivars are of dark purple leaf spots with leaflets sometimes turning yellow. The disease can cause rapid defoliation and, because of its symptoms, may be confused with black spot. The spores of the disease are only formed on lower leaf surfaces and can develop and spread rapidly under humid cool conditions.

Fungicides give only partial control of this disease and unless nurseries modify their growing conditions this disease is likely to become even more serious.

B) *Stem Canker on R. rugosa.* Since the early 1980's batches of *R. rugosa* stems imported from Holland have suffered from purple/black stem lesions resulting in losses of up to 50%. Two fungi, *Gnomonia rubi* and, in 1990, *Phomopsis mali*, have been found causing the lesions. These diseases, and a general dissatisfaction with the quality and cost of imported stems, have stimulated interest in the home production of stems by budding onto *R. laxa* rootstocks.

C) *Black Mould (Chalaropsis thielavioides)* is a wound-infecting disease which, on rare occasions, can cause almost total losses through budding failure. The heavy black growth of the fungus prevents union of the stock and bud. In cases investigated in Britain it appeared that the disease had built up on rootstocks that had been poorly stored, so that the disease was widespread when budding took place.

D) *Virus diseases* do not appear to be widespread on bushes budded onto seed-raised *Rosa corymbifera* 'Laxa' rootstocks. However viruses can sometimes cause trouble on bushes grown on vegetatively propagated rootstocks. Some cultivars from the USA and New Zealand budded onto vegetatively propagated rootstocks have been infected with *Prunus* necrotic ringspot virus. In Britain cultivars such as 'Pascali', 'Fragrant Cloud', and 'Peace' have been severely stunted when budded onto *R. rugosa* stems infected with strawberry latent ringspot virus.

DISEASE RESISTANCE AND ROSE BREEDING

Rose cultivars vary widely in their susceptibility to rust, powdery mildew, and black spot. The factors involved in resistance are largely unexplained, although anti-fungal substances on leaves, cuticle thickness, and chemical substances within leaves have all been suggested as being involved in black spot resistance.

Most rose breeders do not specifically breed for resistance, but they do screen their seedlings for susceptibility and weed out those that are obviously susceptible. Unfortunately, even if a cultivar begins its life being resistant to disease, new races can develop that can overcome the resistance.

Some breeders have deliberately sought to introduce resistance from wild species such as *Rosa wichuraiana* and *Rosa roxburghii*, which are highly resistant to black spot, with good results.

Unfortunately, scientific research into identifying the genes responsible for disease resistance would be extremely expensive and difficult to justify.