

Agriculture

You are here: [Home](#) > [Agriculture](#) > [Horticulture](#) > [Fruit and nuts](#) > [Berries](#) > Raspberries and cultivated blackberries: Pests and diseases

Raspberries and cultivated blackberries: Pests and diseases

Note Number: AG0570

Published: November 1996

Updated: December 2011 and August 2013

This Agriculture note lists the common pests and diseases of *Rubus* crops in Australia. It is not a comprehensive list of all rubus diseases found worldwide, nor a full description of the life cycle of disease organisms. Life cycles of all major and minor rubus diseases can be found in *Compendium of Raspberry and Blackberry Diseases and Insects* edited by Ellis, Converse, Williams and Williamson; 1991, APS Press, St Paul, MI, USA.

Virus diseases

Raspberry Bushy Dwarf Virus (RBDV) - is the most common virus disease reported in rubus crops. It is transmitted by pollen, and therefore spread by bees and other insects which forage in flowers. Symptoms are yellow flecks or splashes on leaves, and poor drupelet set causing crumbly malformed fruit. The yellow leaf colouration, when observed in raspberries, appears as if touched quickly with a paint-brush. It is a distinctive yellow colouration rather than the more common pale cream-yellow caused by sucking insects or senescence. Some raspberry cultivars are immune to infection by RBDV, and in others infection is symptomless. Willamette is the only immune raspberry cultivar grown in Australia. The condition is symptomless in some blackberries and Loganberry, however yields and cane growth of Loganberry are seriously reduced. Virus diseases are incurable in the field. Infected plants should be destroyed, following identification of the disease organism. The only safeguard against virus infection is to begin with clean plants supplied by an approved plant health scheme.

Fungal diseases of fruit

Grey Mould - caused by the fungus *Botrytis cinerea*, is the most serious berry disease found both in Australia, and worldwide. Symptoms are a grey fungal growth, frequently affecting only a few drupelets, and then more commonly at the aperture end of the fruit, at the "collar". Grey mould is distinguished by growth of short grey "fur", which grows rapidly in wrapped punnets. Infection begins during flowering, and remains latent in withered floral parts. Infection occurs via the stigma and style, and stamens. It is exacerbated by cool wet conditions, from flowering onward. It is important for management of the disease to encourage free air movement around fruit and accelerate drying after rain. This can be done by keeping primocanes separate from fruiting canes, by keeping row bases clean and narrow, and by favouring cultivars which

present fruit well Spores are present throughout the year, as the fungus also attacks canes, dead leaves and other decaying vegetation. Alternate year cropping can reduce the background level of inoculum by removing all canes in the winter after harvest. Cultivars vary in their susceptibility to grey mould both on the plant, and post-harvest. None can be regarded as being resistant to grey mould. Correct post-harvest handling of fruit is essential for the suppression of grey mould. Complete eradication from a crop is not an option, and all fruit should be treated as susceptible to rot, given conditions favourable for disease.

Fruit Anthracnose - caused by the fungus *Elsinoë veneta*, causes a hard grey patch on the top of drupelets, around the point where the style meets the fleshy skin of the drupelet. When it occurs, it is frequently found only on one side of fruit, or facing one direction. It is exacerbated by rain during ripening. It is distinguished from the more common grey mould by the absence of hyphae, which give grey mould the appearance of short "fur". Cultivars differ in susceptibility; it is rarely reported from Willamette, Chilcotin and Meeker raspberries, but Skeena is susceptible.

Fungal diseases of canes and foliage

Cane anthracnose - incited by the fungus *Elsinoë veneta*, causes blotchy purple and grey lesions on the primocanes of raspberries, Loganberries, and blackberries. Lesions start as circular purple spots in late spring. As the disease progresses, lesions enlarge to less regular shapes and the middle turns grey, leaving a purple margin. The economic loss caused by this condition is unknown; if wet weather spreads it to fruit, losses can be considerable. Its severity is reduced by alternate year cropping. Copper oxychloride - based sprays are registered for chemical control. Preventative spraying should commence during winter, when canes are dormant.

Raspberry yellow rust - is caused by the fungus *Phragmidium rubi-idaei*. It appears firstly as yellow - orange pustules on the upper side of raspberry leaves, in spring. Later in the season orange-yellow spots appear on the under-side of leaves, and these turn black as the fungus life-cycle progresses. The condition is exacerbated by cold wet weather; warm, dry weather will halt the spread of the disease. Cultivars differ in susceptibility. The spores (teliospores) overwinter in cracks in the bark of dormant canes. Alternate year management will reduce background inoculum. Yellow rust is usually regarded as a cosmetic problem only, however it can defoliate canes if prolonged wet weather in spring encourages rapid development. It is not seen on blackberries. Copper oxychloride - based products are registered for use against leaf rust.

Blackberry rusts - may be caused by several fungi. The biocontrol agent *Phragmidium violaceum* can infect the late season thornless blackberries and wild or weed blackberries; the trailing blackberries, and erect blackberries are less susceptible. Symptoms begin with yellow-red blotches on the upper leaf surface, which darken to red-purple spots with yellow or brown centres. Powdery yellow pustules develop on the under-side of leaves, directly below the spots on the upper surface. The pustules change colour to black over a period of weeks. The fungus requires cool moist conditions and invades young tissue.

Septoria leaf spot - caused by the fungus *Septoria rubi*, causes evenly-shaped lesions on blackberry canes and leaves, usually with a whitish centre and purple-brown margin. It does not attack raspberry plants. Damage is more severe following prolonged wet periods and control begins by encouraging foliage to dry

quickly after rain, such as by avoiding training into bundles or excessively dense patches of foliage.

Cane and leaf rust - caused by the fungus *Kuehneola uredinis* affects blackberries, producing yellow or orange spore bodies on stems and the undersides of leaves. *Kuehneola* can be distinguished from *Phragmidium* rusts by the absence of prominent red-brown spots on the upper surface of affected leaves.

Root diseases

The most severe and common root disorders found in Australia are caused by fungi. In the last fifteen years, *Phytophthora* root rots have become the single most serious soil-borne raspberry pathogen in all raspberry - growing areas of the world.

Phytophthora root rot - caused by *Phytophthora cryptogea* and possibly other species of *Phytophthora*, has been more frequently reported in Australia in the past ten years. Blackberries and hybrids appear to be resistant or immune to *Phytophthora*. Affected raspberries gradually lose their roots, starting with the fine white feeder roots which form in late winter - spring, and progressing to the larger structural roots. Symptoms vary, but all relate to loss of a functional root system. Most commonly, floricanes die after bud burst; this may occur as leaves expand, or as laterals elongate, or as fruit ripen. Leaves show marginal scorch and browning (necrosis), usually a loss of colour (chlorosis) just inside the necrotic region, and sometimes a reddening in patches inside the chlorotic region. Primocanes may not be affected in floricane-fruiting cultivars, or alternatively they wilt, and then die, showing the same necrosis as seen in floricane leaves. The same symptoms can be observed in plants killed by drowning in waterlogged soil. Control begins by avoiding wet soils which allow production and dispersal of infective propagules, by amelioration of soil structure pre-planting, and by ridging or hilling rather than planting on flat beds. Raspberry cultivars vary in their susceptibility to *Phytophthora* and to different species of *Phytophthora*. Cultivars reported resistant in Europe are not always resistant in Australia, and vice versa.

White Root Rot - is caused by a species of *Vararia*, and is characterised by the presence of sheet-like masses of white hyphae on roots and crowns of raspberries and blackberries. Affected plants wilt and die. They may yellow, and initial symptoms can include poor lateral development and small leaves, before the severity of the disease becomes obvious. The disease is most severe in warm dry soils. It may survive on roots and branches of forest trees remaining in the soil following clearing. It is spread by direct root contact and usually spreads only slowly. Control measures include not allowing soil to dry out and speedy removal of afflicted plants. Replant sites should be fumigated.

Armillaria - *Armillaria* species cause death of *Rubus* plants with similar symptoms to other root-rotting fungi. *Armillaria* are associated with dead and rotting wood left in the soil from forest or orchard clearing. The fungal growth is characterised by white or yellowish mycelial sheets on the main roots and crown, under the bark. They are easily confused with *Vararia*, and expert identification should be sought prior to undertaking control measures. They can persist for many years and are very difficult to control. Eradication relies on removal of dead and dying plants plus any other wood which may be a source of disease in the adjacent area. In autumn, some *Armillaria* fungi produce fruiting bodies characterised by a yellowbrown cap, known as honey fungus.

Crown Gall - is a bacterial disease transmitted by *Agrobacterium rubi* and *Agrobacterium tumefaciens*.

A. tumefaciens has a wide host range including many Rosaceous crops, such as pome and stone fruits, and grapevines. The condition causes growth of large lumps of tissue, with either a smooth bark-like exterior or a rough callus-like appearance. Galls form at soil level on blackberries and hybrids, and may be totally buried on raspberries. They may be as large as a grapefruit. The galls are produced by cells of the host plant into which the bacteria has transmitted a piece of its own DNA known as a plasmid, which programs the host cells to produce specific nutrients required by the bacteria. Once a plant is infected the condition cannot be eradicated. Control measures rely primarily on nursery and farm sanitation. Nursery stock should be bought from a high health source and plantations should be prepared using green manure crops to break the linkage between host plants. A modified strain of *A. tumefaciens* known as *A. radiobacter* strain K84 is used by fruit tree nurseries to protect plants from invasion by *A. tumefaciens*, however it is not reported to protect host plants from *A. rubi* infection. The bacteria requires a wound site to enter the host plant and infection is hastened by nematode damage.

Pests

Two-spotted mite (*Tetranychus urticae*) - also known as spider mites, are minute arthropods found in warm weather on the underside of plant leaves. They look like very small spiders, with an oval body marked on the upper side with two prominent spots. They are more commonly found on raspberries than blackberries. Their feeding ultimately causes pale spots to appear on the upper side of leaves, which can become a silver sheen, and can cause leaves to "burn" in hot weather. In low numbers they cause little damage but in large numbers they reduce growth and the quality of buds formed for next season's crop. They have a wide host range and for this reason reliance solely on chemical controls is of little use. They may be controlled under most circumstances by predatory mites which eat the pest mites, plus chemicals registered for control of mites at either the adult or egg stages. Two spotted mites are mainly a problem where large crops of other host plants are present or where extensive insecticide spraying has removed their natural enemies.

Dried fruit beetle (*Carpophilus spp*) - is an occasional pest found in raspberry fruit. Adults are up to 3 mm long, brown or black, with a narrow, fattened oval shape. The thorax is almost flattened cylindrical in outline and the wing cases finish before the end of the abdomen. They are more a pest of drying and rotting fruit, but their feeding habit of climbing inside raspberries makes them hard to control and easy to overlook. No insecticides are registered for use against *Carpophilus* in raspberries. They should not be confused with *Stethorus* beetles, which are also brown or black, but are smaller (up to 2mm long) and almost hemispherical. *Stethorus* beetles are an important predator of thrips and mites, and are related to ladybirds.

Looper caterpillars - are the larvae of the light brown apple moth, *Epiphyas postvittana*. Their prevalence varies considerably from one season to another. The adult moth is buff coloured, with a wingspan up to 18mm, and hides under foliage during the day. The caterpillars start life very small and yellow, changing to green as they enlarge up to 18mm before they pupate. They wriggle quickly when disturbed, or fall or hang suspended from a thread like spider web. They feed on leaves, and roll leaves to hide and pupate. Their main damage to raspberries is cosmetic, when they climb to the top of freshly picked fruit. They occur more

on raspberries than blackberries. Control mainly depends on not killing their natural enemies. Pheromone mating disruption techniques are being developed for use in apples, and may be appropriate where serious outbreaks occur regularly.

Earwigs (*Forficula auricularia*) - are recognised by a prominent pair of forceps on the end of the body. Adults may be up to 12 mm long. Although they have wings they rarely fly, preferring to run and hide when disturbed. They are nocturnal. Damage is mainly seen in raspberries, where they chew into drupelets from the point of styler insertion, leaving the drupelets hollowed out with the seeds half exposed. Control is best affected by not leaving hiding places for them, such as loose straw mulch. They can be trapped by leaving upturned flowerpots under the crop plants. Consult your farm chemical supplier for chemicals registered for use on the ground around the crop.

Green Vegetable beetle (*Nezara viridula*) - attacks raspberry fruit by sucking sap, causing drupelets to shrivel. The adult is green, shield-shaped, about 15 mm long, and releases a stink when disturbed. The nymphal stages look like small adults but with a range of green, yellow, brown and black markings. Control mainly relies on clean farm management to minimise weed populations. No chemicals are registered for use against these pests in rubus crops.

Plague Thrips (*Thrips imaginis*) - cause damage to flowers by sucking all flower parts. They are slender insects, up to 1.2 mm long, and are best detected by shaking flowers upside-down over a sheet of paper or white handkerchief; alternatively, they can be made to run around inside flowers by gently breathing warm air into the flower. They look like bristles cleaned from a shaving razor, except that they move. They may cause total loss of youngberry crops if not controlled. They seldom damage Silvan blackberry flowers, and more commonly damage Silvan blackberry and raspberry fruit by sucking the drupelets adjacent to the calyx, producing a speckled silver appearance. Control starts with weed free plantings, however they migrate on the wind over large distances. Extreme care must be used if they must be sprayed, as they normally occur at the time when bees are doing their work.

Dock sawfly (*Ametastegia glabrata*) - is occasionally seen in raspberries, where it bores holes in primocanes late in the growing season, causing growth above the entry point to die. The adult is a small fly, up to 10 mm long, with a narrow dull black body and the wings held at an angle like a European wasp. Control relies primarily on farm hygiene, specifically by removing dock weeds which act as the primary host for the dock sawfly.

Rutherglen bug (*Nysius vinitor*) - The adult female is about 5 mm long, grey-brown, with a narrow body, and black eyes. The male is smaller and darker. Adults have two pairs of wings, the lower being silvery and the shorter, upper pair are darker silver with dark lines on the trailing edges, which produce an inverted Vee marking on the insect when the wings are folded. They have a wide host range and are strong fliers, and migrate in swarms. They can arrive suddenly in large numbers and suck sap from fruit and leaves. Their numbers are strongly influenced by weather, being most prevalent in dry spring weather following wet winter.

Fruit tree borer (*Maroga melanostigma*) - is a native moth which primarily attacks a range of fruit and shade trees. Raspberries and willows are occasionally attacked. Damage is caused by the larvae boring into mature raspberry primocane stems, causing them to snap during training or fruiting. The larvae tunnel into the stems, and feed nocturnally on the bark surrounding their entrance. They produce frass which is held in a thin tough webbing and which may girdle the stem. Should the problem be extensive or occur over more than one season, control should start with either removing or treating their major hosts in the area, such as plums, or black wattle trees.

Nematodes

Nematodes are microscopic creatures which cause damage to plant roots. They cannot be seen with the naked eye, and expert diagnosis is necessary to confirm their presence. The most common, *Pratylenchus penetrans*, has a wide host range including many pasture species. Nematodes are associated with decline of raspberries through feeding on the roots, with the spread of certain viruses (nepoviruses) and also with damage allowing crown gall to invade plants. Typically, damage is seen as a non-specific decline in vigour, and failure to respond to fertiliser or irrigation. Poor areas gradually extend down-hill as the nematodes migrate in soil water. Small numbers can co-exist with raspberries without causing symptoms; in North America, a count of 500 nematodes per 500 cm² of soil is regarded as the economic damage threshold. Control relies on clean farming practices, as once they are established they are hard to eradicate. Planting nursery stock from highhealth sources, and planting into well-prepared soil that has been prepared by green manuring and fallowing are the best means of control. Plan field drainage to minimise water flow through the soil in winter.

Slugs and snails

Slugs and snails can cause damage to *Rubus* crops, more commonly to raspberries than blackberries. Control begins with rigorous weed control. If they persist, slug and snail killer may be spread on the ground under the crop. Consult your farm chemical supplier for products registered for use in raspberry and blackberry crops.

Birds

Birds can cause total devastation of *Rubus* crops if you are unfortunate enough to grow the only food source available. Blackberries are more commonly affected than raspberries. Bird predation is so specific to each farm and its surrounding ecosystem that general warnings cannot offer much advice. In areas adjacent to cities, the imported nuisance birds such as mynahs and starlings are the dominant pest species, but in more rural areas several native birds, notably parrots and cockatoos, can be a serious threat. If the problem is severe, the only proven remedy is to net entire crops. It is most important to net before birds start feeding; once they have developed a taste for a crop they will try hard to find access through holes in nets, and they seem to have all day to spend looking for a way in.

Physiological disorders

Sunburn and white drupelet disorder are both caused by high levels of sunshine, particularly following cool overcast weather. Heritage raspberry appears most susceptible, but the late-season thornless blackberries also suffer. Affected raspberry drupelets turn white as if bleached, and affected blackberry drupelets appear pink and cooked. The only avoidance measure is to erect shade - cloth.

Effects of plant management on disease

Most of the foregoing notes on Rubus pests and diseases refer to farm hygiene as the area where control begins. In some areas where the plague insects do not occur in large numbers, it is entirely possible to grow rubus crops without recourse to chemical sprays. In others, only copper oxychloride-based winter protectant fungicides are necessary. Control begins with clean farming practices. These include:

- pre-planting land preparation
- bed formation and land drainage
- high health nursery stock
- rigorous weed and sucker control
- primocane management to optimise air-flow through the canopy
- management of areas adjacent to crops
- thorough, regular harvesting to avoid leaving over-ripe fruit
- proper post-harvest cooling and handling of fruit
- proper calibration of spray equipment and adherence to recommended rates of chemical use
- timely and minimal use of pesticides
- observance of natural predators and minimal disruption to their populations

"If you kill the predators, you inherit their work"

Acknowledgements

This Agriculture note was developed by Graeme McGregor, Mark Whattam and Bill Washington of FFSR in July 1996.

It was reviewed by Mark Hincksman and Neville Fernando of Farm Services in December 2011 and August 2013.

For information about DEDJTR, Phone: [136 186](tel:136186)

Deaf, or hearing or speech impaired?

National Relay Service: [133 677](tel:133677)

or www.relayservice.com.au

Victorian Bushfire Information Line: 1800 240 667

Following changes to the Victorian Government structure, the content on this site is in transition. There may be references to previous departments, these are being updated. Please call 136 186 to clarify any specific information.

Page last updated: 29 July 2015

© The State of Victoria, 1996-2015