

Redheaded Pasture Cockchafer

Adoryphorus couloni

Background

Almost wherever you dig in pasture or turf in south-eastern Australia, you find slow moving, creamy-coloured, C-shaped grubs from 10 to 30 mm long. These are the larvae of native cockchafer beetles of the scarab family. Most do not cause any problems, but two species in particular are significant pests, at the grub stage, in pasture (especially rye grass) and in lawns - the red-headed pasture cockchafer (*Adoryphorus couloni*) and the black-headed pasture cockchafer (*Acrossidius* spp.).

It is important to distinguish between the two because the control measures are different – what controls the black-headed cockchafer will not control the red-headed cockchafer. A brief description, including pictures, of the black-headed pasture cockchafer is included at the end of this fact sheet to help you distinguish between the two.

Other cockchafers that can be encountered often have yellow heads and are root feeders, but usually cause less damage than red-headed and black-headed pasture cockchafers.

Please Note : Both red-headed and black-headed cockchafers can look similar to , and therefore be confused with, African black beetle – a serious pest on the mainland but

not known to be here in Tasmania. If you think you have seen cockchafers, please also check against our [African black beetle fact sheet](#) , which has comparison pictures to help you distinguish. It is a notifiable pest, so please report it to us if you think it may be African black beetle.

How to spot a cockchafer problem

The first sign of a red-headed cockchafer problem is often a pasture that has become weedy. This is typically followed by more obvious damage to the pasture



This is a heavy cockchafer infestation and the damage is made worse by birds seeking the grubs. You should investigate well before it gets this bad. If you see uprooted plants, especially ryegrass, in a paddock that is being grazed, you should dig a spade square and check for cockchafer grubs.

Red-headed pasture cockchafer grubs grow larger, are more sluggish and have reddish brown heads on a white body. The head appears rough or matte in contrast to the shiny head of black-headed pasture cockchafer. Red-headed pasture cockchafer grubs remain in the soil to feed on the roots of pasture and ***hence cannot be controlled with insecticides.***

Red-headed cockchafers may be less familiar to residents of southern Tasmania because they were restricted to the north prior to 1987, but are becoming more prevalent in the south, including Hobart.

Description of the red-headed cockchafer

The adult is a broad, shiny black beetle about 15 mm long. At this adult stage, it looks more superficially similar to [African black beetle](#) than black-headed cockchafer, which is a similar length but much narrower.



Red-headed cockchafer at the adult (ie beetle) stage

The grubs are soft-bodied and white with three pairs of legs, a hard, reddish brown head capsule and the posterior quarter of the body is a little swollen. The body wall is transparent. The white derives from fatty tissue under the skin and the grey of the rear end results from soil in the gut. The posterior end of the grub is more opaque than in black-headed pasture cockchafer. They are up to 30 mm in length when mature. They are less active when exposed than black-headed pasture cockchafer grubs, which retreat rapidly if placed on a spade.



Red-headed cockchafer at the grub stage. Note that the head is reddish-brown rather than bright red.

Damage

The adult beetle does not cause damage but the grub feeds on roots and humus in the root zone, usually within 50 mm of the soil surface. Damage is most serious in late autumn and is caused by two factors - severing of the roots during feeding and physical disruption of the roots during underground movement of the grubs. This promotes uprooting by stock and birds

which, during a dry spell, leads to plant death from moisture stress. Underground movements of grubs also makes pasture feel spongy underfoot. In older pastures, 250 – 500 grubs per square metre (more than 15 per spade square) can sever most roots.

Grasses with weak, fibrous roots such as ryegrass are especially vulnerable to damage. In a mixed sward, the ryegrass component is often uprooted completely by stock activity. The resulting gaps in the pasture allow fast-growing annuals such as barley grass, storksbill and capeweed to establish. This trend to weediness is often the only symptom that is clearly visible unless the soil is turned over. Subterranean clover usually re-establishes itself satisfactorily after attack by this pest, provided sufficient soil seed reserves exist.

Damage first appears in late March and may be severe by May or early June when aggravated by bird activity. The forest raven is the main culprit in most regions.

Low soil temperatures in winter reduce the activity of grubs before more active feeding resumes in late August. Damage to pastures in spring is usually less severe than in autumn. There are several reasons for this. Grub numbers will have declined through natural mortality, pathogens accelerate grub death when the soil temperatures are warmer and the plants compensate much better because the spring growth flush enables them to re-establish a satisfactory root system, providing sufficient moisture is present.

Although the red-headed pasture cockchafer takes two years to complete its life cycle, the existence of overlapping generations means

that grubs are present every year. Usually, one generation is more abundant than the alternate generation so that, in any particular district, damage is worse every second year. The years of severe infestation are not necessarily the same in different parts of the state.

Life cycle

Adult beetles emerge from the soil at dusk in late winter and early spring (from the end of August until mid-October). Swarming flights which occur at this time help to disperse the beetles. At night the female beetles lay eggs at a depth of up to 80 mm in the soil. Each female may lay up to 25 eggs in her lifetime.

The eggs hatch in late spring, 6–8 weeks after being laid. The young grub then passes through three stages. The first two of these are passed rapidly so that by late summer–early autumn the final (third) stage is reached. This stage is the most damaging and feeds for almost 10 months. Feeding is intense during the autumn but is interrupted by the onset of cold weather in June.

At this time the grubs may dig to warmer depths in the soil and stop gaining weight. Nevertheless, the grubs do feed during spells of mild weather in winter. Active feeding and weight gain resume in early spring and continue until early summer when grubs reach full maturity and finish feeding. They then leave the root zone and dig as deep as 200 mm where they form a small cell and their body takes on a J-shape. This is the prepupal stage. After two weeks the grub's skin is split off to reveal the pupa which does not feed. The pupal stage lasts 6–8 weeks before the beetle emerges in February–

March. However, the beetle remains in the pupal cell as a sexually immature adult for about six months until it digs its way to the surface to engage in locally synchronised flights in late winter–early spring. The beetles do not feed and rely on energy reserves laid down during the larval stage.

Control

Spraying will not control this pest in pasture.

This contrasts to black-headed pasture cockchafers, which feed above ground and are therefore susceptible to foliar insecticides.

In existing pastures, management practices must be integrated and aimed at limiting damage as much as possible. When damage is noticed in mid–autumn, stock should be removed, particularly from ryegrass dominant pastures, and the paddock spelled until late winter. This will help prevent all the ryegrass being uprooted by grazing animals and maintain maximum leaf area needed to re–establish root growth. Although supplementary feed may have to be bought to carry displaced stock over winter, the expense will usually be repaid in superior spring production and the maintenance of desired botanical composition in the infested paddock.

Diversify feed sources on the farm away from total dependence on ryegrass pastures. This might entail sowing some autumn forage crops, storing extra hay in anticipation of a winter feed shortage aggravated by pests, or sowing down some areas of cockchafer tolerant pastures. Such pastures could include phalaris, cocksfoot or tall fescue with a small percentage of ryegrass mixed in.

Dairy farmers are not advised to mix grasses in one paddock. Lucerne and oats are also relatively tolerant of cockchafer attack.

It is not yet known if the novel endophytes MaxP and AR1, plus other new novel endophytes yet to be released, will protect some new fescues and ryegrass from root–feeding cockchafers.

If conditions are not too boggy, rolling of the infested pasture can be beneficial since this helps the sward or seed to re–establish contact with the soil and may kill grubs close to the soil surface.

Large numbers of cockchafers can be destroyed by the trampling effect of block grazing stock. This should be done before the end of May while grubs are still close to the surface. This strategy should be employed when large numbers of grubs are first noticed because the benefits in the longer term will be substantial. However, such a rotation would not be advised if the grazing animals were milking cows.

Black-headed cockchafer grubs are fairly mobile, and have a black head on a white body. They emerge from the soil at night to feed on stems and foliage of pasture and can be controlled with insecticides applied to the foliage. They will be familiar to residents of southern Tasmania.



Black-headed cockchafer at the grub stage.



Black-headed cockchafer at the adult (ie beetle) stage

At the adult (ie beetle) stage, the black-headed pasture cockchafer has a narrower body than the red-headed pasture cockchafer. Also, it flies in summer, whereas the red-headed pasture cockchafer beetle flies in spring.

A further distinction is that the head of black-headed pasture cockchafer is almost as wide as the segment behind, whereas it is much narrower in the red-headed pasture cockchafer.

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