

Cockchafers and African Beetles - Chris Alenson Mar '15

Pasture Pests- Which ones do you have?

There are a range of pests that can limit production in our pastures. The table below has recommended minimum threshold levels of pests per spade

	J	F	M	A	M	J	J	A	S	O	N	D	Threshold levels
Red headed Cock chafer													4 per spade
African Black Beetle													3 per spade
Black Headed Cock Chafer													6 per spade

Redheaded pasture cockchafer (RPC) - Australian native

Member of the beetle family. All stages except the beetle live their lives below the soil surface. The damaging stage of the life cycle is the **larvae stage**, feeds underground on the roots of pasture species. The damaged pasture can then be further degraded by grazing stock and birds. Two year life cycle.

The four main life stages are:

1. eggs
2. larvae
3. pupa
4. adult beetle

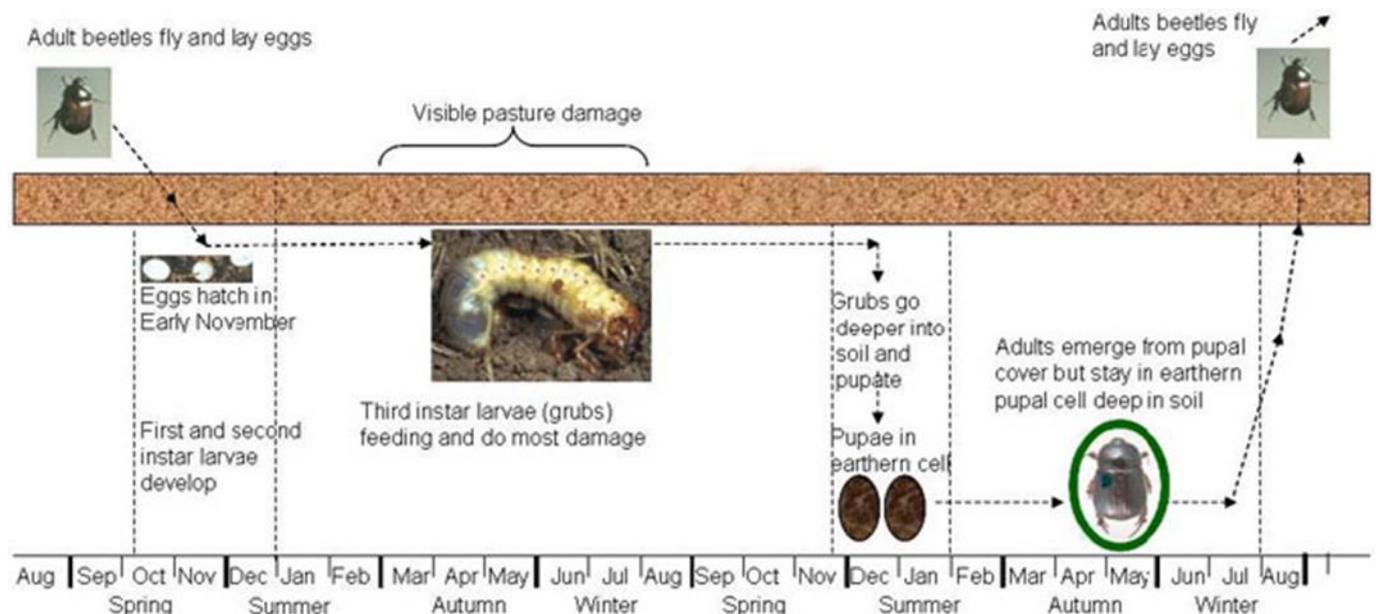


Instar is the name given to the developmental stage of an arthropod between moults. For example, after hatching from the egg and insect is said to be in its first instar. When the insect moults it is then a second instar and so on

The adults are stout, shiny, and black to dark reddish-brown beetles from 10 to 15 mm long. The larvae grow to about 30mm long and are a creamy colour as they mature.

The larvae are soft, whitish grubs. Their body is slightly transparent in appearance with the posterior quarter being a little swollen and more greyish in colour. The larvae have three pairs of yellowish legs just behind the head which has a hard, **reddish brown** appearance.

Adult beetles emerge from the soil at dusk from later winter to early spring (the end of August until mid-October), fly for a brief period, mate and lay their eggs singly in the soil under pastures. **Most damage to pastures is done by the third instar larvae.** They prune or completely cut off the roots of pasture plants; Damage appears in March & may be severe by May.



Birds such as ravens or ibis feed on the larvae and uproot it in the process. Damaged pastures are then open to weed infestation

Factors influencing the impact - In Victoria outbreaks have been noted as occurring on acidic sand and sandy-loam soils over clay and were most severe where the top soil was deeper than 6 inches and where there is more than 500mm annual rainfall.

Species damaged - Rye grass can be severely damaged. Analysis of gut content of the larvae has shown that they feed preferentially on organic matter in soil under perennial rye grass. Pasture species such as phalaris, lucerne and cocksfoot have been noted as being less damaged.

Dynamics of their outbreaks - Its emergence as a pest is thought to be associated with increased levels of soil organic matter in improved pastures and the use of shallow-rooting species. Good pasture cover during spring and summer favours egg laying and survival of the young cockchafer larvae.

Control options - No synthetic insecticides have given effective economical control of redheaded cockchafers. This contrasts to **black headed** cockchafers where the larvae come to the surface to feed and are accessible to synthetic insecticides.

Biological insecticides - Specific nematodes will parasitize soil insects and kill them with a symbiotic bacteria which the nematode carries in its gut. A single infested cockchafer larva can result in many thousands of nematodes then leaving the host and seeking new larvae.

The product 'Weevilnem™' produced by Ecogrow Australia Pty Ltd (see website www.ecogrow.com.au) is listed as being useful for the control of redheaded pasture cockchafers in nursery situations (the product is also used in turf for the control of a number of similar soil borne pests).

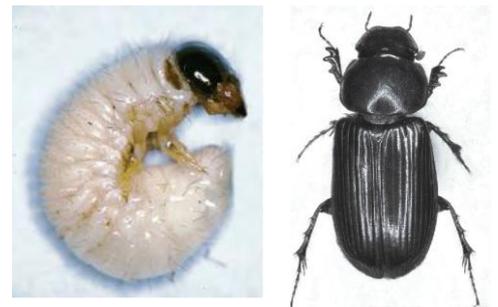
Management strategies

- Pasture species such as phalaris, lucerne and cocksfoot which are less susceptible to damage than ryegrass may be alternatives in some situations. In Victoria close grazing in spring to remove rank dry herbage has been proposed as a means of reducing the attractiveness of pastures for egg-laying by the adult female beetles
- Removing dry pasture residue by grazing before the beginning of autumn may effectively reduce larval densities during that autumn and the next winter.
- Damage may also be reduced by sowing perennial grasses that are more tolerant to damage than annual pasture plants.

Blackheaded pasture cockchafer (BPC)

It is a native insect of South-Eastern Australia. They appear to be pests in areas where the annual rainfall exceeds about 480mm. The adult cockchafer beetles are dark brown to black in colour, have long fine legs and are approximately 10 to 11 mm long. The cockchafer larvae ("curl" grubs) are white or greyish-white in colour, from and have soft bodies (Figure 2). The black headed pasture cockchafer has a one year life cycle.

They may also be noticeable when large numbers of them burrow into animal manure, often pulverising and burying it, possibly being confused with dung beetles.



The young grubs feed on the humus underground until the autumn break. They then tunnel to the surface and emerge at night to feed on the pasture, throwing up **small mounds of soil** around their outlets. The grubs grow through three stages or instars, digging deeper burrows and consuming more pasture throughout autumn and winter.

The blackheaded cockchafer grubs feed on clovers, ryegrass and animal dung.

May-June is the period of maximum grazing, when the rate of pasture growth is slowing down due to the cold weather. Bare patches become noticeable at this time.

Control and recovery techniques

Unlike the redheaded cockchafer, the black headed cockchafer can be controlled by insecticides as they are surface feeders.

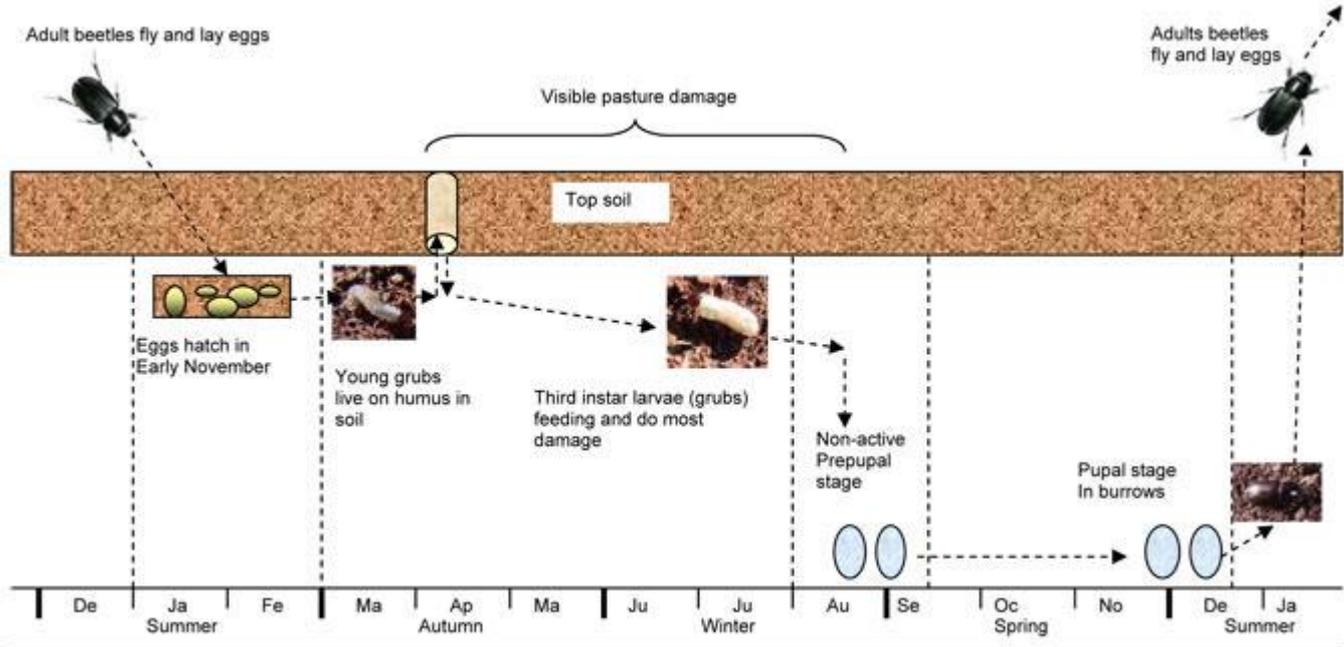


Figure 3. Life cycle of blackheaded pasture

Differentiating between black and redheaded cockchafers

Blackheaded Cockchafer	Redheaded Cockchafer
Head capsule is shiny brown to black within hours of hatching	Head capsule is red to reddish brown
Tunnel visible with dirt mounds around the entrance	No tunnels visible
Grubs move off quickly if handled or disturbed (approx. within a minute)	Tend to stay in "C" shape for longer period if handled (for several minutes)
Ryegrass and clover plants physically "disappear" from pasture	Ryegrass clumps appear dead but may be intermingled with green clumps
Pastures become denuded (except for weed) in ever increasing areas	Clumps may be turned over by flock of birds or "pulling" by grazing animals
Ground surface is covered with cockchafer castings, similar to worm castings around tunnel entrances	Ground may appear like talcum powder in dry weather with severe infestations



Demonstrating Sustainable Farm Practices

African Black Beetle (ABB)

African black beetle can cause significant economic damage to horticultural crops in particular potatoes, vines, olives and various vegetables. It can be a significant pest in newly-sown pasture and lawns. It can also affect some ornamental tree and shrub species. It has many host plants but pasture or amenity grasses are the preferred hosts and potato is the most important crop host. One generation of black beetle each year.

The larval stage is present from mid spring to late summer, they then change into pupae.



Identification of larvae or grubs

The **adults** are usually found on or under the soil surface, to a depth of about 150 mm. Fully grown larvae or grubs are approximately 25mm long. Brown/tan head capsule.

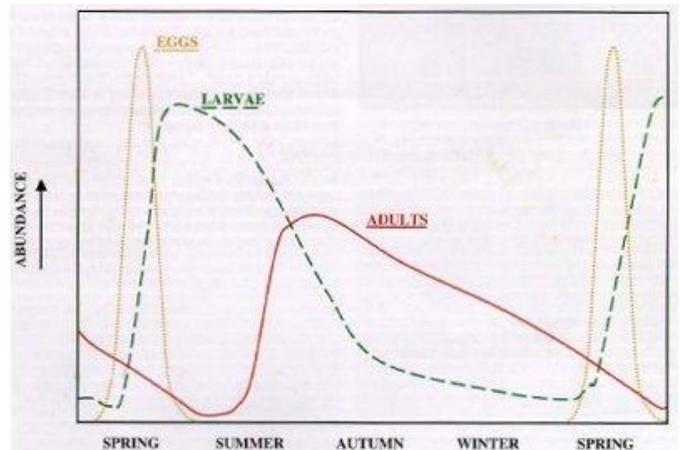
Identification of adults

Brown/black beetles, approx 14 by 7 mm

Similar in appearance to cockchafer

Body shape relatively parallel Weak ridges (striae) on wing covers

Fly in late summer and autumn.



Seasonal abundance of the life cycle stages of African black beetle

References

<http://www.depi.vic.gov.au/agriculture-and-food/pests-diseases-and-weeds/pest-insects-and-mites/the-redheaded-pasture-cockchafer>

http://archive.agric.wa.gov.au/PC_92703.html?s=0

ID Guide <http://www.gippsdairy.com.au/LinkClick.aspx?fileticket=PniOANU7Mig%3D&tabid=39>

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