

Identifying and Managing Cockchafers and Corbies

Handouts

**Information prepared in conjunction with 8x5 field days in June 2005
at “Apsley Park” (near Bothwell) and “Forton” (Epping Forest)**

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Blackheaded pasture cockchafer

Acrossidius tasmaniae & *Acrossidius pseudotasmaniae*

Description

The adult stage is a shiny dark brown or black beetle 10-12 mm in length. The eggs hatch into C-shaped, white or greyish-white larvae with a characteristic shiny brown or black head capsule and three pairs of legs at the front end. When fully grown in winter they are about 15 mm long.

Distribution

They are widespread and serious pests of pasture in Tasmania especially in coastal areas and on well-drained, light soils.

Damage

At night they emerge to feed on the foliage of clovers, grasses and some weeds. It is common for infestations to be confined to well-drained crests in paddocks although continuous infestations over many hectares are prevalent in bad years. Bare patches appear in the pasture from mid-autumn to late winter. Sown perennial species seem to disappear first. Closer examination of the soil surface will reveal tunnel entrances which are usually next to a low mound of thrown-up soil. Unlike corbie burrows there is no silken lining associated with the holes of the pasture cockchafer. Heavy grazing in autumn or winter can aggravate damage because the new regrowth is within easier reach of the larvae.

Life cycle

The adult beetles emerge from the soil in mid to late summer. Swarming flights are common at dusk on calm, warm evenings. Eggs are laid at this time and hatch after 3-4 weeks. Feeding finishes in early to mid-spring.

Monitoring

Monitor pastures in May to late June. Look out for bare and overgrazed patches. Pay close attention to sandy or loamy paddocks that had bare patches in January or February, or a history of pasture cockchafer attack. A spade-square sample to a depth of 20 cm is a useful unit to measure with and a series of these should be taken diagonally across a paddock (5 to 20 times) at 20 pace intervals. If average numbers exceed **six larvae per spade-square** then action should be considered.

Control for blackheaded cockchafer

- For best results **sprays should be applied before the end of June**. Timing is important because larvae do not come to the surface and feed every night. During periods of warm, dry weather (or during a cold, frosty period) they may not feed for several days. Feeding seems to be most intensive on moist nights after rain. Therefore the **best time to spray is at the end of a dry spell, a few hours before rain is anticipated**. Leave at least four hours for the spray to dry and stick on the pasture.
- **Chlorpyrifos, Alpha Cypermethrin and Fenitrothion** are the three main registered chemicals. Check with your local dealer and follow the label and MSDS.
- **Maintain pasture cover at 400-600 kg DM/ha**. Short, open pasture is more attractive to the egg-laying beetles than rank pasture (whereas the reverse occurs for corbies). A high clover component also favours pasture cockchafer.
- **Tolerant pasture species include phalaris and cocksfoot**. Cocksfoot has good tolerance to surface and root-feeding cockchafers. Phalaris is resistant to all cockchafers and corbies.
- Burying surface organic matter through **ploughing** kills newly hatched larvae. This must be done before May.
- In some areas in some years pasture cockchafers are attacked by a pathogenic fungus which often cause population numbers to drop below damaging levels. This fungus, *Cordyceps gunnii*, is widespread in the State but cannot be relied upon as a control measure at the present time.

Redheaded pasture cockchafer

Adoryphorus couloni

Description

Adults are stout, shiny black beetles about 15 mm long. Larvae are soft, whitish grubs with three pairs of yellowish legs and a hard, reddish brown head capsule. The posterior quarter of the body is a little swollen and greyish in colour. The body wall is transparent. When at rest the body is curved in the shape of a letter C. Newly hatched larvae are only 5 mm long but mature larvae are robust grubs up to 30 mm in length.

Distribution

Southern Midlands, Derwent Valley, Hobart, South Arm and Flinders Island. It has not been recorded at altitudes above 200 meters.

Damage

Damage first appears in late March and may be severe by May or early June. Low soil temperatures in winter cause larval activity to diminish before more active feeding resumes in late August and continues until early summer when larvae reach full maturity and finish feeding. 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.

Life cycle

Adult beetles emerge from the soil at dusk from later winter to early spring (the end of August until mid-October) and lay their eggs, which hatch in the late spring 6-8 weeks after being laid. Larvae reach the pupal stage in January and dig deeper into the soil to pupate. The pupal stage lasts 6-8 weeks before the beetle emerges from the pupal skin 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.

Monitoring

Monitor pastures in late March to June. Look out for dead clumps of grass and increased weedy areas. A spade-square sample to a depth of 20 cm is a useful unit to measure with and a series of these should be taken diagonally across a paddock (5 to 20 times) at 20 pace intervals. If average numbers exceed **six larvae per spade-square** then consider developing a management strategy, outlined below.

Management for redheaded cockchafer

- There are **no synthetic insecticides** that give effective economical control of redheaded cockchafers since their subterranean feeding habits create difficulties relating to the penetration and stability of chemicals. This contrasts to blackheaded cockchafers which feed above ground and are susceptible to synthetic insecticides.
- A biological insecticide (**BioGreen™** Granules) is available for red-headed cockchafer. It is a potent strain of a native soil fungus, *Metarhizium anisopliae*, formulated as a granule that is mixed with seed, but not fertiliser, when sowing pasture. It is best used as a preventative strategy over several years. It is not a quick remedial strategy for one season.
- **Remove dry pasture residue** before autumn (through grazing or cutting hay) to reduce the habitat value for redheaded cockchafer moths.
- **When damage is noticed in mid-autumn, stock should be removed and the paddock spelled until late winter.** This will help prevent all the ryegrass being uprooted by sheep 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 from the infested paddock.
- **Diversify feed sources** away from total dependence on ryegrass pastures. Eg. 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. **Tolerant pasture species include phalaris, cocksfoot, tall fescue, lucerne and oats.**
- If conditions are not too boggy, **rolling** of the infested pasture can be beneficial since this helps the sward re-establish contact with the soil.
- Burying surface organic matter through **ploughing** kills newly hatched larvae. This must be done before May.

Corbie and Winter Corbie

Oncopera intricata & *Oncopera rufobrunnea*

Description

The brownish-grey moths are about 3 cm long. The front pair of wings bear an intricate pale pattern and the span across the outstretched wings is about 4 cm. Compared to corbie, the winter corbie has a more reddish-brown tinge to the wings. Newly-hatched larvae are about 3 mm long, growing to 6 cm in length by late spring. The body is smooth-skinned and dark greyish or bluish-grey in colour. The smooth shiny head is dark brown. Three pairs of legs are situated behind the head while four pairs of sucker-like prolegs are present on the underside of the middle third of the body.

Distribution

Corbie ranges widely over all the pastoral areas of the State, particularly the lower Midlands and Derwent Valley. Winter corbie is less commonly a problem in Tasmania than corbie, being most prevalent in the higher rainfall pastures of the north-east and north-west.

Damage

The two closely related species differ mainly in their life cycles and, therefore, the time of year when they cause damage. Both pests feed on ryegrass, clovers and seed-heads, but generally they avoid flat weeds. Pasture thinning occurs when the larvae reaches about 3 cm in length and is first apparent in May-June for winter corbie and August-September for corbie. Because the larvae chew off pasture at ground level severe damage can result in a short time. The small bare patches that first appear rapidly increase in area of denuded pasture by August (winter corbie), or October-November (corbie).

Monitoring

Larval numbers can be assessed by digging a spade square sample to a depth of 20 cm in **May-July for winter corbie and August-September for corbie**. At these times the larvae will be 3-4 cm long and in shallow tunnels. A square should be dug every 20 paces in a line across the paddock (5 to 20 times) at 20 pace intervals. **An average of more than two larvae per spade square will warrant treatment**. To check egg numbers, monitor pastures – at dusk - from late November (Winter Corbie) and January to March (Corbie).

Life cycle

Adults: Moths emerge from the pupae in late spring (winter corbie), or late summer (corbie). The moths fly at dusk between late November and late December (winter corbie) and mid January and mid-March (corbie). After mating the female seeks suitable areas of sward into which to lay. Rank cover is favoured since this offers some protection to the eggs.

Larvae: Hatching of the eggs occurs in mid-summer (winter corbie), or mid-autumn (corbie), after a 5-8 week incubation period. The young larvae band together on the surface and spin a communal webbing over themselves below which they feed in relative security. These webbings often stand out in infested pastures on frosty autumn mornings. At this stage the larvae probably feed on fungus growing on litter at the base of plants but eventually they start to consume grass at ground level. As the larvae grow they disperse away from these congregations and in early winter establish individual silk-lined burrows in the soil from which they emerge at night to feed on the adjacent pasture. The larvae increase in size steadily through the winter and spring to become fully grown in early spring (winter corbie), or late spring (corbie).

Pupa: When fully grown the larva finishes feeding and securely seals its burrow with a silken cap. The moth stage then forms within the almost rigid skin of the pupa. The moth emerges four to eight weeks later.

Control for winter corbie and corbie

- **Pasture should be grazed short prior to spraying.** This will promote better coverage and penetration of the chemical.
- Early treatment is better than late treatment but **spraying as late as July-August for winter corbie or October for corbie** can still give worthwhile savings of pasture. **When pasture cockchafer is also present, the optimum time for spraying is mid to late May when both pests can be controlled with the same insecticide.**
- **Chlorpyrifos and Fenitrothion** are the main registered chemicals for corbies. Check with your local dealer and follow the label and MSDS.
- **Spray only onto dry pasture**, preferably late in the afternoon of a fine day, otherwise the mixture will run off wet grass and be lost in the soil. Once dried on the sward (after several hours), the mixture is not readily washed off by rain. Late afternoon spraying means the spray is at its most toxic that evening when the corbies emerge to feed.
- If areas have been laid bare consideration could be given to closing up beyond the withholding period in order to encourage the desirable pasture species to re-colonise these patches.
- Rank pasture is more attractive to the egg-laying moths than short, open pasture whereas the reverse occurs for pasture cockchafer. **Phalaris** is resistant to all cockchafers and corbies.
- Burying surface organic matter through **ploughing** kills newly hatched larvae. This must be done before May.

Monitoring Calender

	RHC	BHC	Corbies
Jan		Beetles	Moths
Feb			
Mar	RH Cockchafer		
Apr			
May		BH Cockchafer	Winter Corbie
June			
July			Corbie
Aug	Beetles		
Sept			
Oct			
Nov			Moths
Dec		Beetles	

Management Calender

	RHC	BHC	Corbies	RHC / BHC & Corbies	
Jan				Remove dry residues & maintain pasture cover	
Feb					
Mar	Apply 'Biogreen' at sowing or by direct drilling on to established pasture			Sown in new resistant cultivars (preferably autumn sown)	Plough in young larvae
Apr		Spray BHC			
May					
June					
July			Spray Winter Corbie		
Aug					
Sept			Spray Corbie		
Oct					
Nov					
Dec					

RHC = Redheaded cockchafer
BHC = Blackheaded cockchafer

To spray or not to spray?

The decision to spray (or to not spray) a paddock can be based on a number of factors, including pasture species, the value of the pasture and the amount of feed available.

Pasture Species:

- If the pasture species has a high tolerance to corbies / cockchafer, then spraying is less likely to be necessary. Remember to always monitor all of your paddocks – corbies / cockchafer can still cause significant damage in a bad year regardless of tolerance.
- If the pasture species has a low tolerance to corbies / cockchafer, then consider spraying only if it is a productive paddock.

Key strategy: establish pasture species that have a high tolerance to corbies / cockchafer so that the reliance on sprays can be reduced.

Pasture Value:

- Protect pastures that have the highest value – ie. pastures with good perennial grass/legume composition.
- Only spray annual grass dominant pastures if feed is required from these annuals. ie, during times of drought.

Key strategy: Aim to reduce annual grass weeds in general and promote more tolerant pastures.

Feed Available:

- If there is plenty of feed, spray your most productive paddocks if populations warrant further action.
- If there is a shortage of feed, then perhaps spraying is warranted to protect what little feed is available to stock.

Another factor to consider before spraying is whether or not the pasture is to be renovated. Spraying isn't worthwhile if you intend to rip it up the following year.

Pest control when renewing damaged pasture

The success of sowing into an existing pasture can greatly depend on managing insect pests. If cockchafer or winter corbie are present, spray the old existing pasture with the appropriate insecticide in order to achieve a reliable kill, then apply herbicide a few days later. If spraying of herbicide and pesticide occurs at the same time, the grubs may not eat the poisoned pasture and thereby will not ingest the pesticide.

If sowing in early autumn is necessary, vigilance is needed from late autumn to early spring. If damaging levels of cockchafer or corbie/winter corbie are found, immediate treatment is required.

Ploughing of the soil in early spring can kill many larvae of cockchafer and corbies while they are still in the upper part of the soil profile. A fallow paddock should be unattractive for egg-laying by corbies and cockchafer in summer. Therefore, the autumn sown new pasture should be assured of a pest-free start. Attention needs to be paid to good seedbed preparation, timing, mixtures and sowing procedure to ensure that a good, vigorous pasture results.

List of Registered Chemicals currently sold in Tasmania

NB: These are the main brands sold and available – there are others products available, but are too numerous to list here. For further advice on products and prices, consult your advisory service.

Corbies

Active	Available Chemicals (Trade Name)	Label Rates	Estimated Cost (per litre)	Estimated Cost (per hectare)
Chlorpyrifos	Nufarm Chlorpyrifos 500EC	900ml/ha	\$13.35/L (20L)	\$12/ha
Fenitrothion	Nufarm Fenitrothion 1000 Farmoz Fenitrothion 1000 Sumithion 1000EC Kendon Fenitrothion 1000	800 – 1000ml/ha (Corbies) 1.3L/ha (Winter Corbie)	\$23.00 - \$30.75/L (20L)	\$30/ha \$40/ha (WC)

Blackheaded Cockchafer

Active	Available Chemicals (Trade Name)	Label Rates	Estimated Costs (per litre)	Estimated Cost (per hectare)
Chlorpyrifos	Nufarm Chlorpyrifos 500EC Farmoz Strike-out 500EC Lorsban 500EC	900ml/ha	\$13.35/L (20L)	\$12/ha
Fenitrothion	Nufarm Fenitrothion 1000 Farmoz Fenitrothion 1000	700ml/ha	\$23.00 - \$30.75/L (20L)	\$21.50/ha
Methidathion	Supracide 400EC	1l/ha	\$47/L (5L)	\$47/ha
Lambda-Cyhalothrin	Karate with zeon technology	20-40ml/ha	\$183/L (5L)	\$7.32/ha
Alpha Cypermethrin (Synthetic Pyrethroid)	Dominex 100EC Nufram Astound Duo	100ml/ha	\$26.65/L (20L)	\$2.65/ha

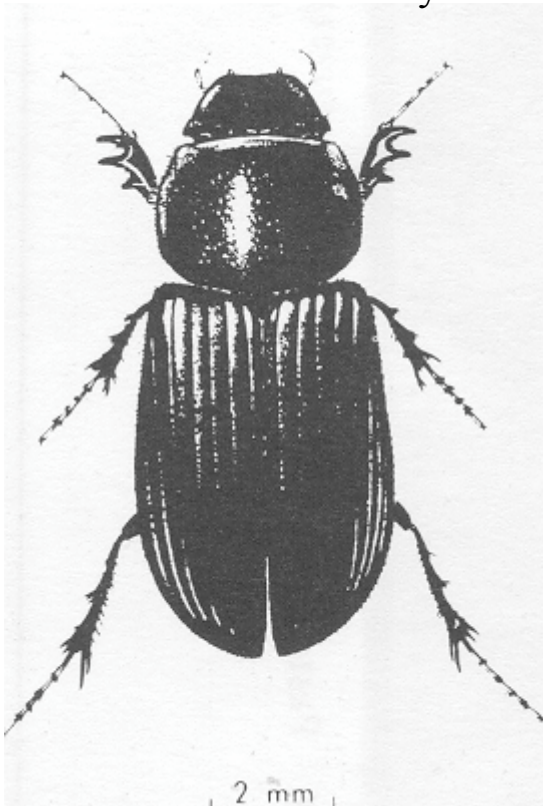
*Loss of income per annum due to loss of pasture productivity is estimated at \$170 for corbies, \$500 for red-headed cockchafer, \$550 for winter corbie & \$950 for black-heads. (Miller, C.S., (1989), *Cost of pasture depredation by corbies & cockchafers*, DPIWE).

- Next 5 pages are a summary of presentation slides from Lionel Hill regarding the lifecycle of cockchafers.
- The remainder of the document is a summary of the presentation slides from Cathy Young regarding the lifecycle of corbies.

COCKCHAFERS

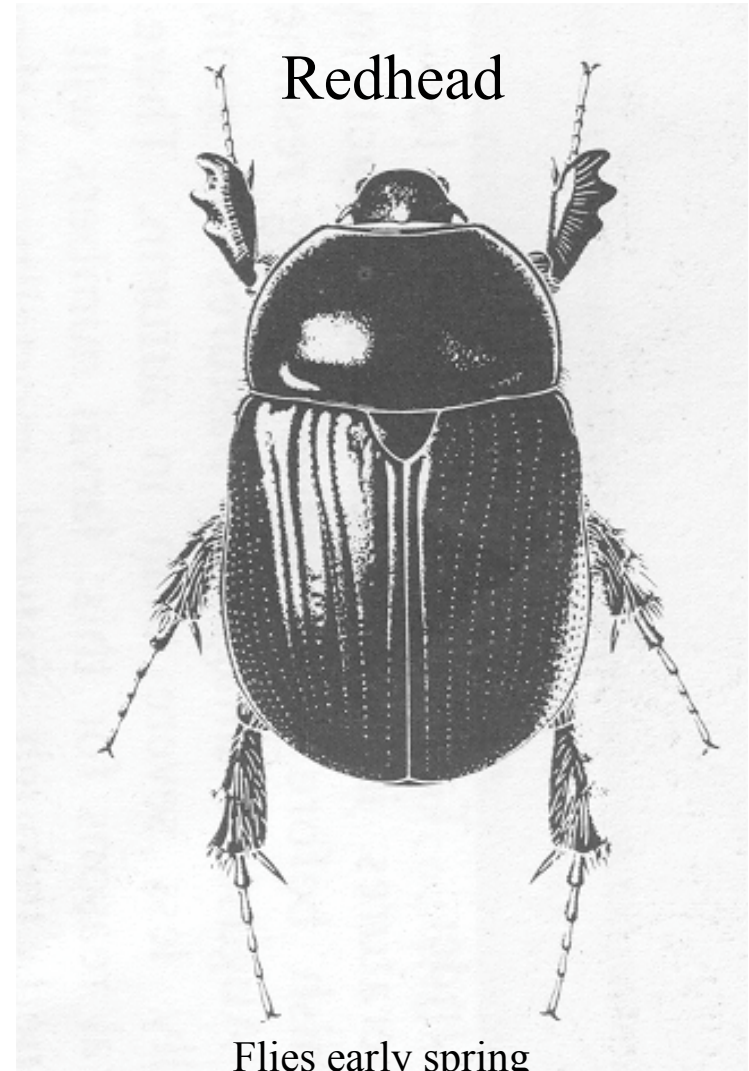
Blackhead

Note the narrow body



Flies late summer

Redhead



Flies early spring



Grubs (larvae) of three cockchafers:

blackheaded (foliage feeder)

yellowheaded (root feeder)

redheaded (root feeder)



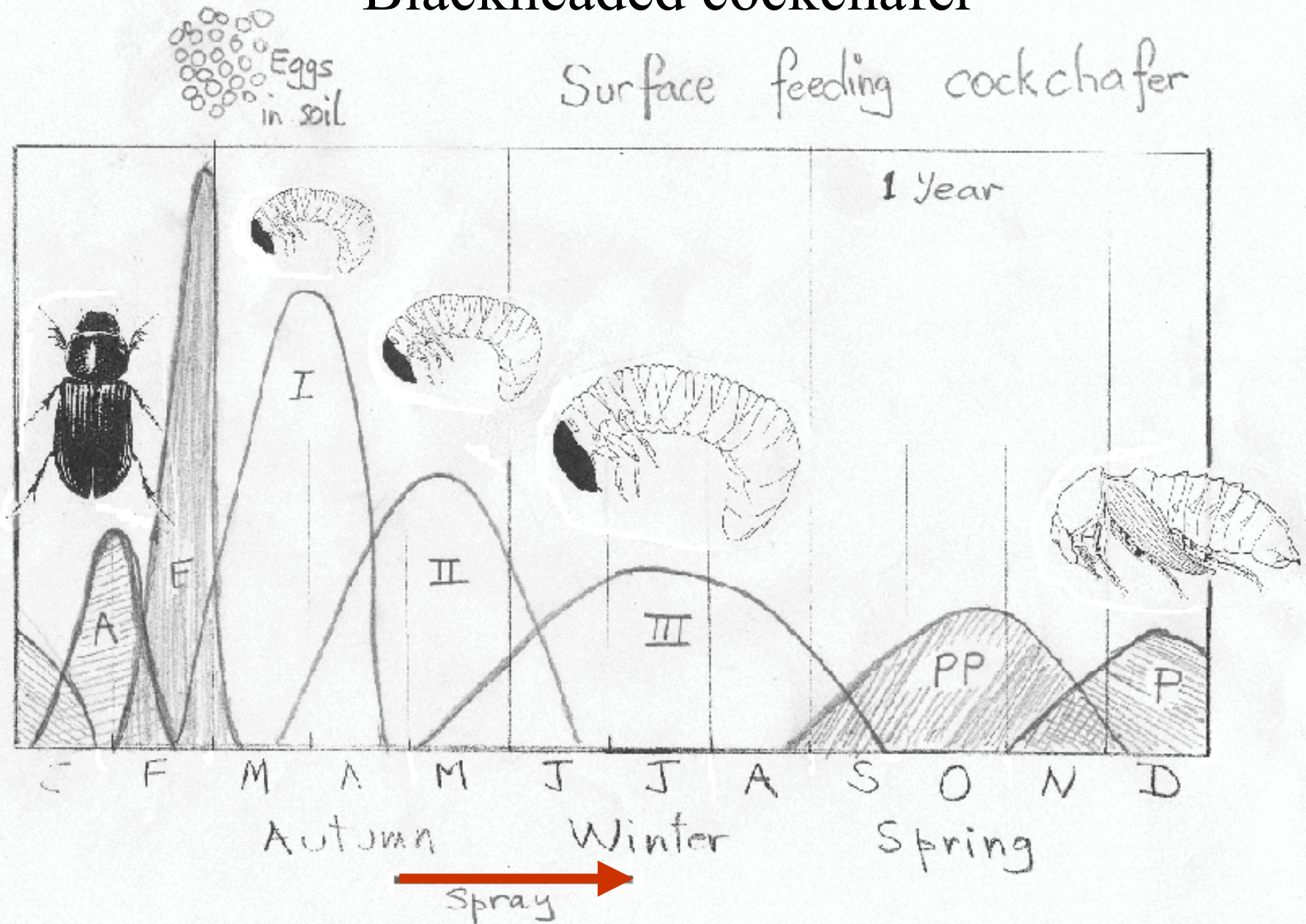
Compared to redheaded
cockchafers,
Blackhead cockchafers
have:

- smoother head
- more transparency
- more activity

(on a spade, BHC's will crawl
around whereas RHC's barely
move)

Blackheaded cockchafer

Surface feeding cockchafer

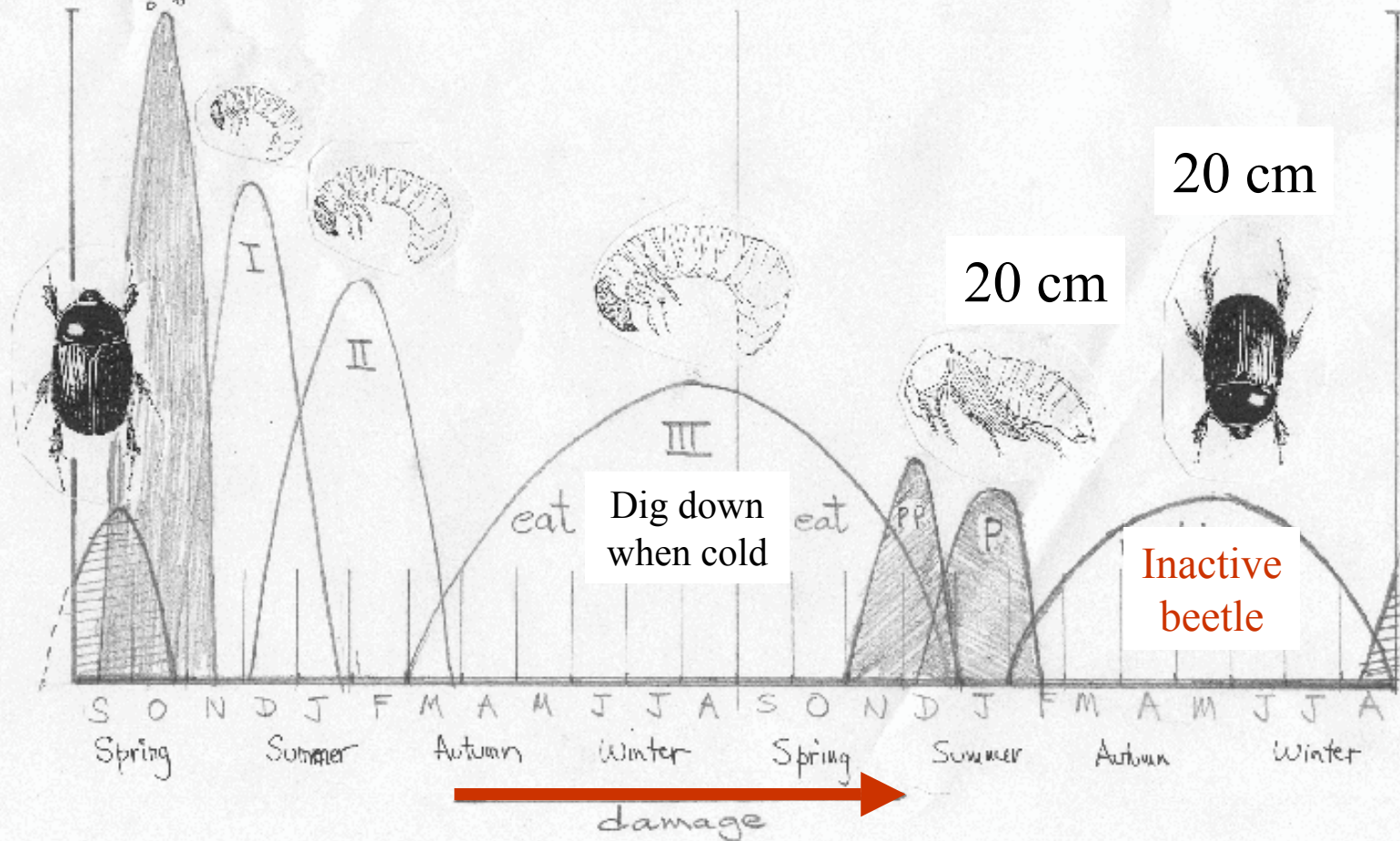


Redheaded cockchafer

25 eggs

Redheaded cockchafer

root feeding cockchafer



What are Corbies?

Corbies are moths



Corbie

Unlike cockchafers which are beetles



Red-headed Cockchafer

Tasmanian Corbies -Corbie and Winter Corbie

There are 2 species of Corbie in Tasmania



Corbie - *Oncopera intricata*



Winter Corbie - *Oncopera rufobrunnea*

Caterpillars or Grubs



Mature grub - 6 cm long



Newly hatched grubs and eggs

Corbie Grub

Shape

- Relatively straight and slender

Number of legs

- Many, 7 pairs



Cockchafer Grub

Shape

- C-shaped, stout

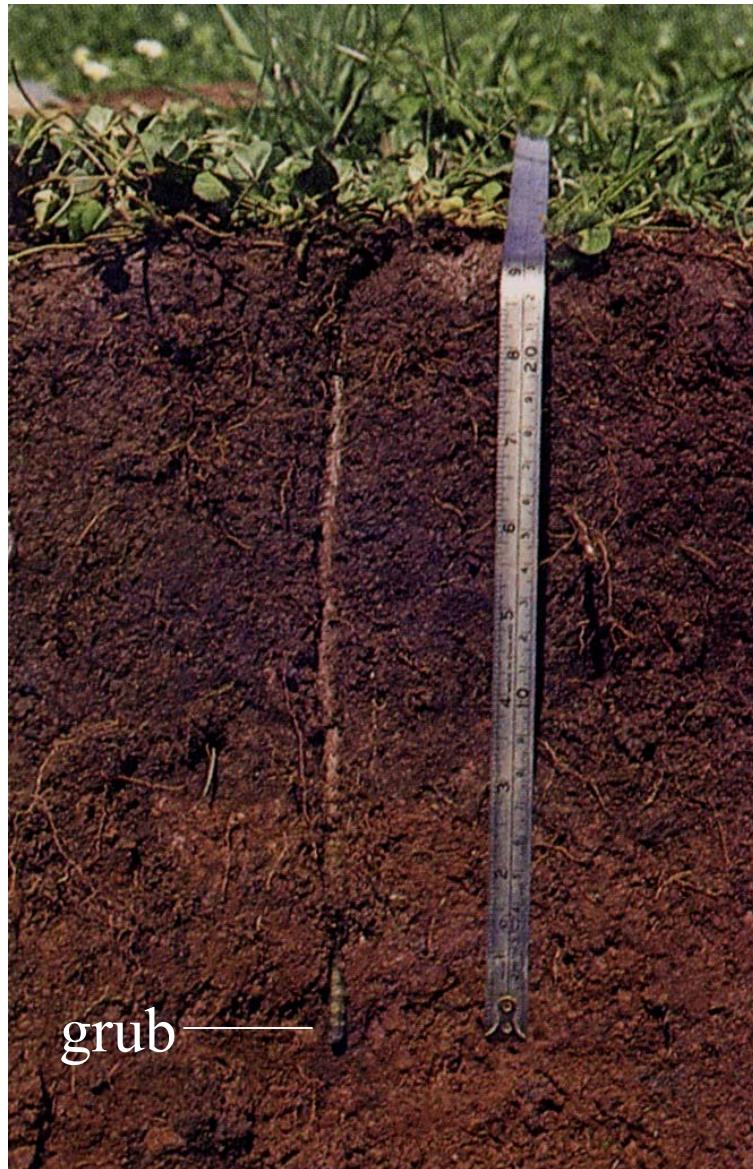
Number of legs

- Few , 3 pairs



Corbies spin silk, Cockchafers don't

Corbie Burrows

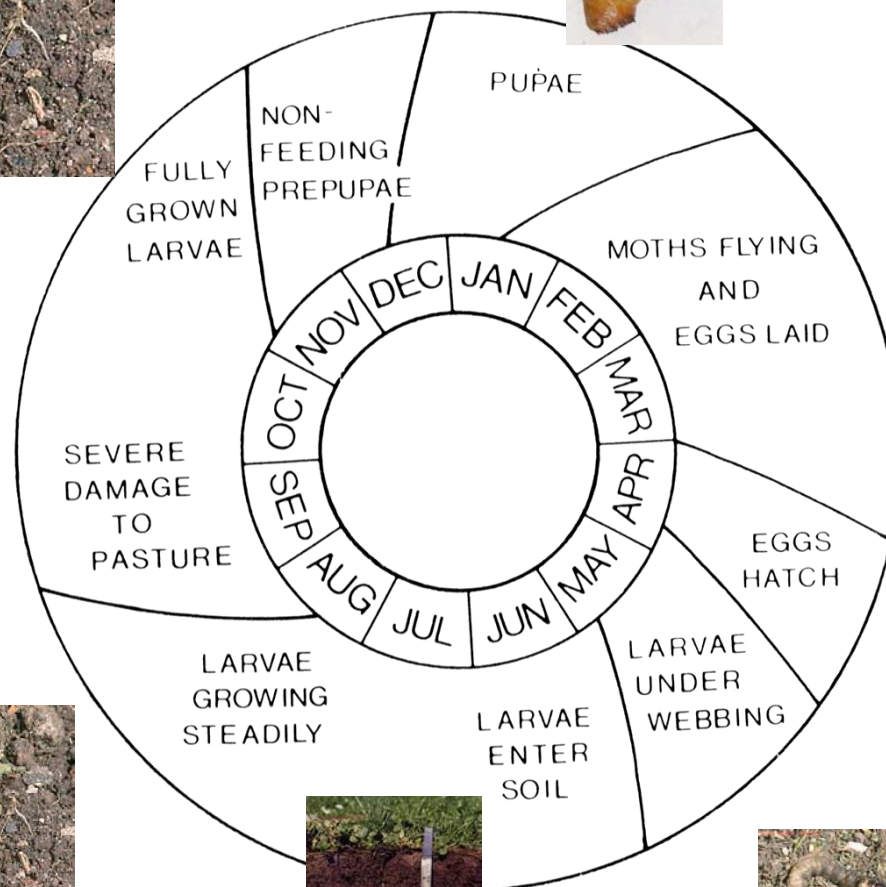
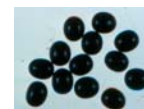
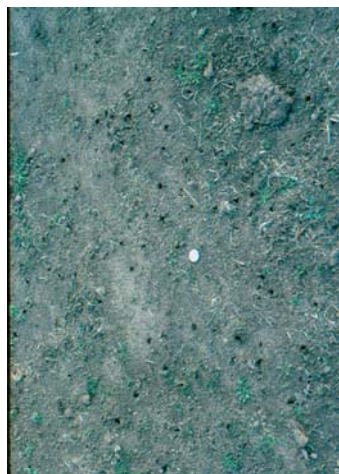


Pasture Cockchafer Tunnel

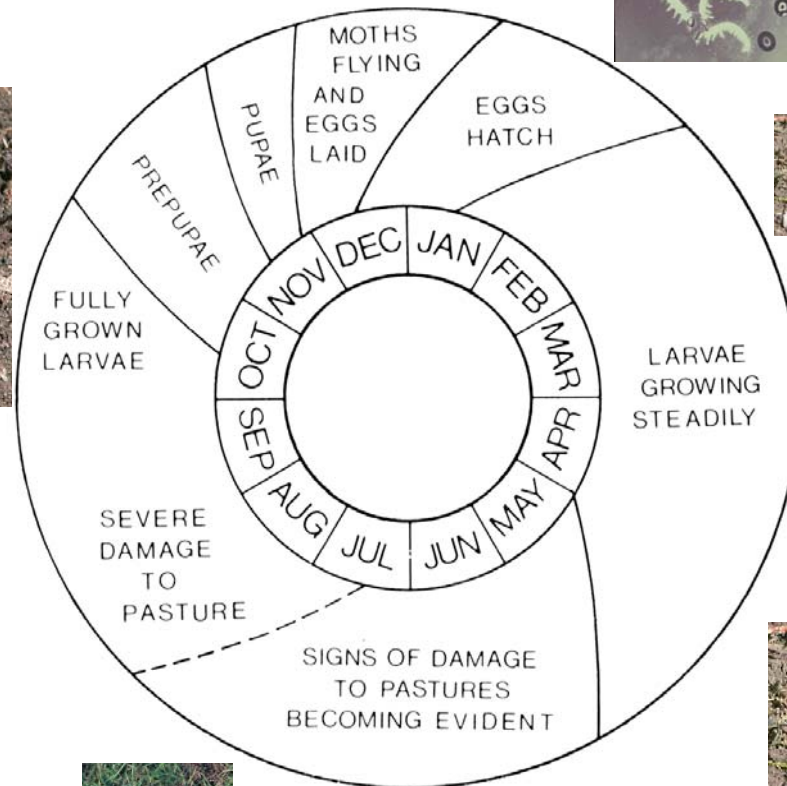
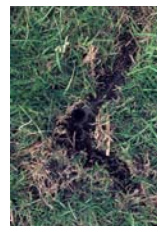
- No runways
- No silk



Corbie – Life Cycle



Winter Corbie – Life Cycle





- Corbies are moths not beetles
- Grubs are dark, long caterpillars
- Corbie burrows have runways and are lined with silk
- Winter corbies are confined to areas with high rainfall in the state; corbies are widespread
- Corbies do most damage in poor growth seasons
- Damage is 1) loss of pasture and 2) weed invasion
- Winter corbies do most damage in winter and are generally more costly than corbies
- Corbies do most damage in spring