



Sugar Research  
Australia

**FIELD GUIDE**

# **PESTS OF AUSTRALIAN SUGARCANE**

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Peter Samson, Nader Sallam, Keith Chandler

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Sugar Research Australia Limited **2019**

# Contents

Page No.

---

Introduction	06
Key	07
Photo index	08
Layout	16
General information	17
Insect life cycles	18
<b>CANEGRUBS</b>	<b>20</b>
Canegrub life cycles and damage	20
Canegrub distribution	23
Canegrub identification	24
Bundaberg canegrub	25
Caudata canegrub	26
Childers canegrub	27
Consobrina canegrub	28
French's canegrub	29
Froggatt's canegrub	30
Grata canegrub	31
Greyback canegrub	32
Grisea canegrub	33
Nambour canegrub	34
Negatoria canegrub	35
Noxia canegrub	36
Picticollis canegrub	37
Planiceps canegrub	38

# Contents

Page No.

---

Plectris canegrub	39
Rhopaea canegrub	40
Rothe's canegrub	41
Sororia canegrub	42
Southern one-year canegrub	43
Squamulata canegrub	44
Distinguishing similar cane beetles	45
<b>OTHER WHITEGRUBS</b>	<b>46</b>
Christmas beetles	46
Redheaded whitegrub	47
<b>ROOT FEEDERS</b>	<b>48</b>
Soldier flies	48
Ground pearls (Margarodids)	49
Cicadas	50
Funnel ant	51
Symphyla	52
<b>SHOOT FEEDERS</b>	<b>53</b>
Wireworms	53
Black beetles	54
Leaf beetles (Rhyparida)	55
Sugarcane butt weevil	56
Stenocorynus weevils, Whitefringed weevil	57
Large moth borer	58

# Contents

Page No.

---

Sugarcane bud moth	59
Field crickets, Mole cricket	60
<b>STEM BORERS</b>	<b>61</b>
Sugarcane weevil borer	61
Termites	62
<b>LEAF AND STEM FEEDERS</b>	<b>63</b>
Locusts	63
Night-feeding armyworms	64
Night-feeding armyworm identification	65
Day-feeding armyworm	66
Sugarcane planthopper ( <i>Perkinsiella</i> )	67
Island planthopper ( <i>Eumetopina</i> )	68
Sugarcane froghopper	69
Linear bug	70
Pink sugarcane mealybug	71
Aphids	72
Spider mites	73
Sugarcane scale	74
<b>RARELY SEEN PESTS</b>	<b>75</b>
Ratoon shootborer, Looper, Wart-eye, Whitefly	75
Oriental rice thrips	76

# Contents

Page No.

---

<b>ANIMAL AND BIRD PESTS</b>	<b>77</b>
Canefield or ground rat	77
Climbing rats	78
Other animals and birds	79
<b>EXOTICS</b>	<b>80</b>
Exotic insect pests	80
<b>BENEFICIALS</b>	<b>81</b>
Canegrub biocontrol agents	81
Biocontrol agents of other insect pests	82
Glossary	83
Index	86
Acknowledgments	96

# Introduction

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This guide has been designed for practical 'in-field' use and text has been kept to a minimum. To help you understand the layout, an individual pest page is illustrated on page 16.

**To use the guide, follow the procedure below:**

## Symptoms

- Determine the main symptom you have seen on page 7
- Matching page numbers will lead you to the pest

## Confirmation

- Specific comparison pages on where, when and how common the pests are will help confirm your diagnosis

Easy-to-read fact sheets which provide management information on a wide range of pests are available on the SRA website [www.sugarresearch.com.au](http://www.sugarresearch.com.au)



# Key

Main symptom	Pest/Page number
Germination failure	Soldier flies (48), bud moth (59), wireworms (53), field crickets (60), mole cricket (60), wart-eye (75), termites (62), weevils (57)
Ratoon failure	Soldier flies (48), canegrubs (25-44), cicadas (50), ground pearls (49), wireworms (53), butt weevil (56), stenocorynus weevils (57)
Dead hearts leading to dead shoots	Wireworms (53), black beetles (54), Rhyparida (55), butt weevil (56), stenocorynus weevils (57), large moth borer (58), ratoon shootborer (75), bud moth (59, in plant cane only)
Yellowing, poor growth and shoot death in young cane	Canegrubs (2-year type, 25-44), ground pearls (49), cicadas (50), symphyla (52), weevils (57), funnel ant (51)
Yellowing and death of semi-mature or mature cane	Canegrubs (1-year type, 25-44), sugarcane scale (74), weevil borer (61)
Boring of large stalks	Weevil borer (61), large moth borer (58), termites (62)
Large animal chewing of shoots or stalks	Rodents (77-78), feral pig (79), wallaby (79), fox (79), eastern swamphen (79), cockatoo (79), bush turkey (79)
Chewing of large areas of leaf	Armyworms (64-66), looper (75), locusts and grasshoppers (63)
Sooty mould	Planthopper (67), mealybug (71), aphids (72), sugarcane scale (74)
Mottling or discolouration of leaves	Planthopper (67), froghopper (69), linear bug (70), aphids (72), spider mites (73)

Similar symptoms may be caused by more than one pest species or by other factors such as disease, nutrition, herbicides and physical damage.

# Photo index

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**Canegrubs  
and other  
whitegrubs**  
pp 25-47



**Soldier flies**  
p 48



**Ground pearls  
(Margarodids)**  
p 49



**Cicadas**  
p 50



# Photo index

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**Funnel ant**

p 51



**Symphyla**

p 52



**Wireworms**

p 53



**Black beetles**

p 54



# Photo index

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**Leaf beetles  
(Rhyparida)**

p 55



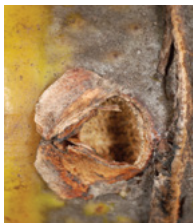
**Weevils**

pp 56-57



**Large moth  
borer**

p 58



**Sugarcane bud  
moth**

p 59



# Photo index

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**Crickets**

p 60



**Sugarcane  
weevil borer**

p 61



**Termites**

p 62



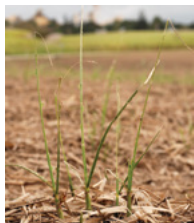
**Locusts**

p 63



# Photo index

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**Armyworms**

pp 64-66



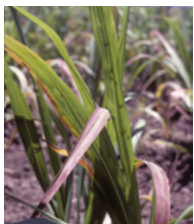
**Planthoppers**

pp 67-68



**Sugarcane  
frog hopper**

p 69



**Linear bug**

p 70



# Photo index

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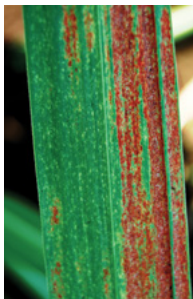
**Pink sugarcane  
mealybug**

p 71



**Aphids**

p 72



**Spider mites**

p 73





# Photo index

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**Sugarcane scale**

p 74



**Rarely seen  
pests**

pp 75-76



**Rodents**

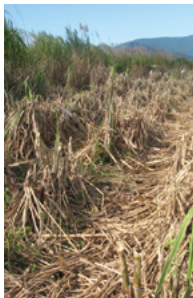
pp 77-78





# Photo index

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## Other animals and birds

p 79



## Exotic insect pests

p 80

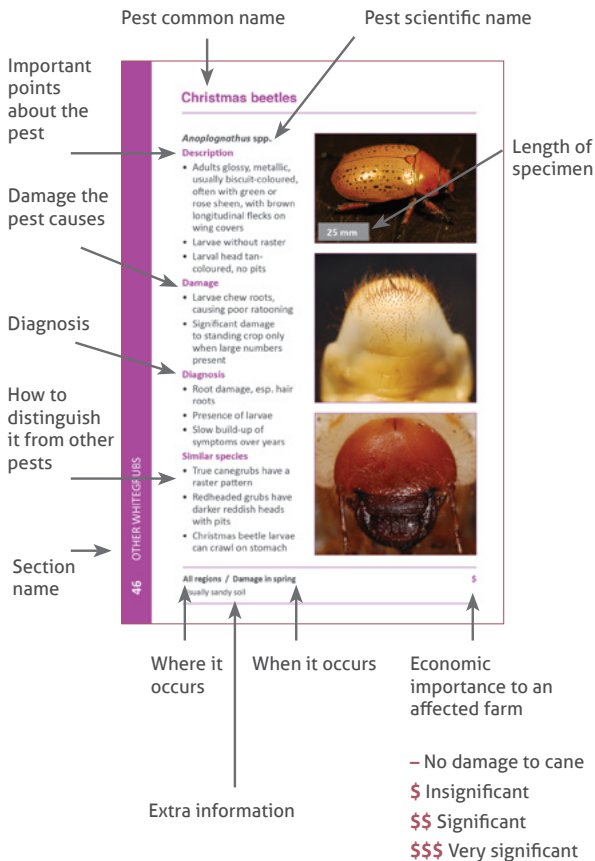


## Biocontrol agents

pp 81-82



# Layout



# General information

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This field guide is intended to assist in the identification of pests or pest damage likely to be encountered in sugarcane fields in Australia. Pests are grouped into 'Canegrubs', 'Other whitegrubs', 'Root feeders', 'Shoot feeders', 'Stem borers', 'Leaf and stem feeders' and 'Animal and bird pests', similar to the groupings in the books cited below, and there are also 'Rarely seen pests', 'Exotics' and 'Beneficials' sections. These groupings are somewhat arbitrary and some species may cause more than one type of damage.

The order of presentation of species follows that in *Pests of Australian Sugarcane* (1993; PG Allsopp, KJ Chandler, PR Samson and PG Story; Bureau of Sugar Experiment Stations, Indooroopilly) and *Australian Sugarcane Pests* (1997; ed. JR Agnew; Bureau of Sugar Experiment Stations, Indooroopilly). The former book contains additional technical details of the pests while the latter includes colour photographs. These books should be consulted for greater detail on pest identification, biology and management than is provided in this field guide.

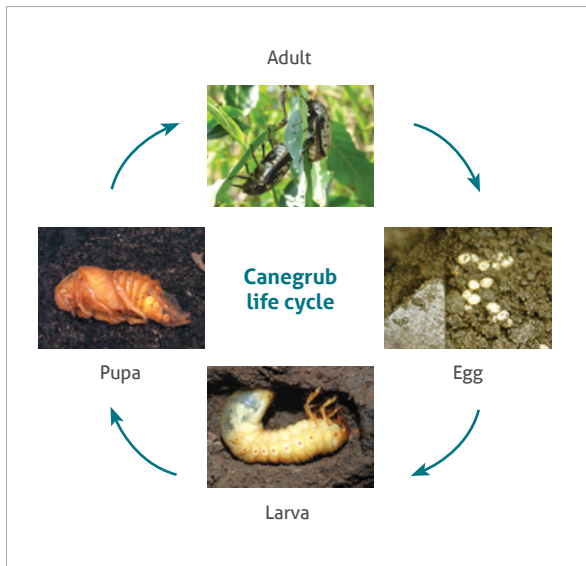
A dollar figure is attached to each pest. This is a subjective assessment of the possible impact of that pest on an individual farm in the absence of effective control measures, and is not indicative of the importance of each pest to the industry as a whole.

The measurement given in millimetres on each pest image is the length of the specimen, or the wingspan for the armyworm moths on page 65.

# Insect life cycles

## Complete metamorphosis (sudden change of form)

For example: canegrubs, weevil borers, soldier flies, armyworms.



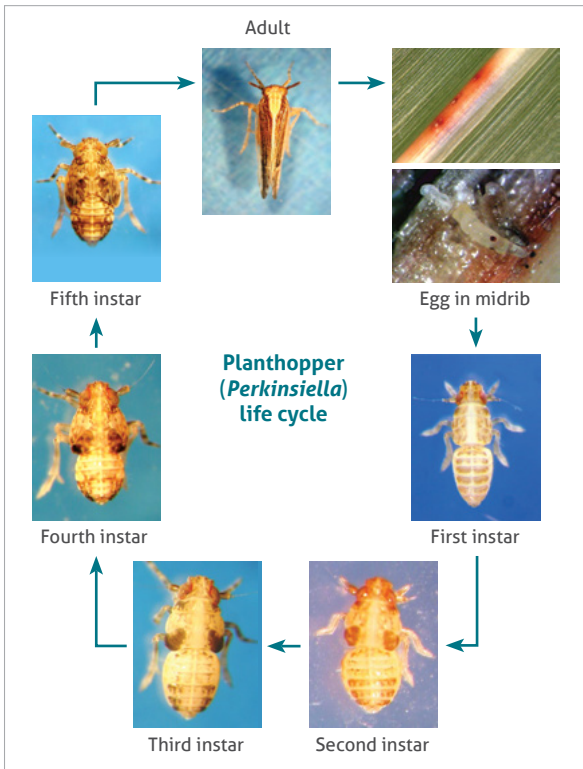
Head capsule size increases at each moult.

Canegrubs have three larval instars (stages between each moult); most insects have more than three.

# Insect life cycles

## Incomplete metamorphosis (gradual change of form)

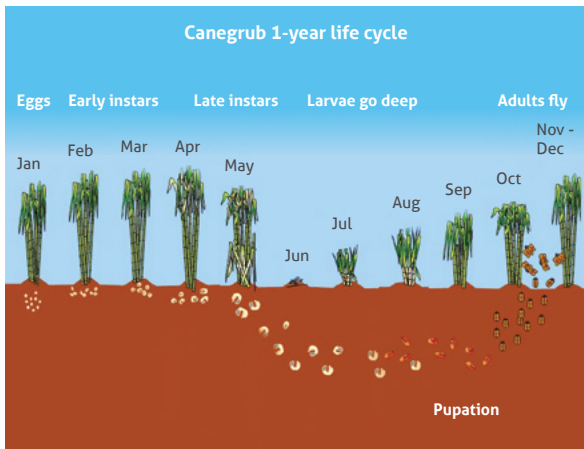
For example: planthoppers, locusts, cicadas, linear bugs.



Development of a planthopper through five nymphal stages (instars) to adult. Wing buds increase in size at each moult and there is no pupal stage.

# Canegrub life cycles and damage

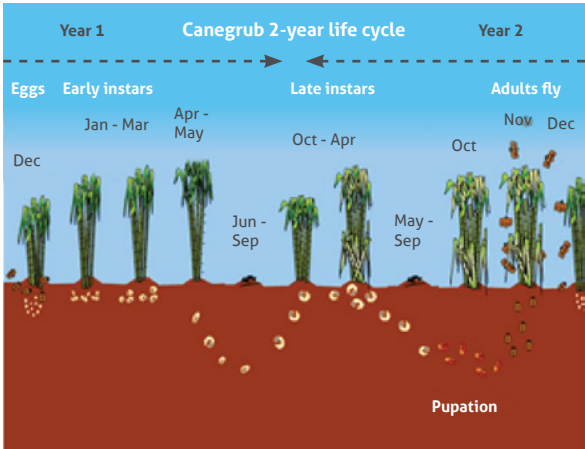
## 1-year life cycle and damage



1-year type damage to semi-mature cane in autumn-winter (greyback canegrub).

# Canegrub life cycles and damage

## 2-year life cycle and damage



2-year type damage to young cane in spring-summer (French's canegrub).

## Canegrub life cycles and damage

---

### Root damage





## Canegrub distribution

Canegrub	M-B	I-T	H	B	C	B-I	M	N-RP	NSW
Bundaberg						●			
Caudata	○	○							
Childers						●			
Consobrina	●								
French's	●	●	●	○	●	○			
Froggatt's		○							
Grata	○	○	○	○	○	○			
Greyback	●	●	●	●	●				
Grisea	○								
Nambour							○	●	○
Negatoria					○	●	●	●	○
Noxia						○	○	○	
Picticollis						○			
Planiceps									○
Plectris									○
Rhopaea								○	●
Rothe's	-	-	-	-					
Sororia	○		○						
Sthn 1-year						●	●		
Squamulata			○	○	○	○			

● Major pest ○ Minor pest – No recorded damage to cane

**M-B** Mossman-Babinda **I-T** Innisfail-Tully **H** Herbert  
**B** Burdekin-Invicta **C** Central **B-I** Bundaberg-Isis **M** Maryborough  
**N-RP** Nambour-Rocky Point **NSW** New South Wales

## Canegrub identification

---

Twenty species  
(19 endemic, 1 introduced)

### Description

- Adults brown to black, white or grey scales
- Larvae white-cream, raster beneath end of abdomen

### Damage

- Larvae chew roots of cane, causing poor growth, stool loss at harvest

### Diagnosis

- Spring-summer damage (2-year type) – wilting, yellowing, death
- Autumn-winter damage (1-year type) – yellowing of large cane, lodging, death, gaps after harvest
- Root damage
- Gouging of stubble
- Grubs under stools

### Similar symptoms or species

- Christmas beetles and redheaded grubs have no raster
- Pachymetra-affected roots are soft, rotten



Hold a grub this way – between thumb and first two fingers. Point the section you need to see at the light.

Note the pattern of hairs beneath the end of its abdomen. (If it won't stay still or threatens to bite, hold it tighter or cool it down in a refrigerator.)

## Bundaberg canegrub

### *Lepidiota crinita*

#### Description

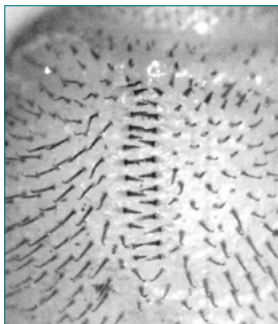
- Adults 20-25 mm long, bright red-brown, dorsal surface coarsely but evenly punctured, each puncture has a thin white scale as long as puncture
- Raster with two single parallel rows of about 15 short hairs, no clear gap between rows

#### Life cycle, damage

- 2-year life cycle

#### Similar species from the same district

- None for larvae
- Adults of southern one-year canegrub do not have small scales on back



South QLD / Damage to young cane in spring-early summer

\$\$

May be mixed with other species in forest loams and clay loams

## Caudata canegrub

### *Lepidiota caudata*

#### Description

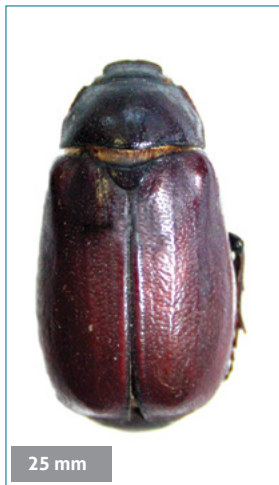
- Adults 21-34 mm long, shining brown with small inconspicuous scales
- Beneath abdomen, dark circular area without scales near centre
- Raster pear-shaped, 27-44 hairs each side, hairs from each side overlap at front of raster

#### Life cycle, damage

- 2-year life cycle

#### Similar species from the same district

- French's and consobrina canegrubs have more hairs in raster and two sides of raster are separate with no overlap of hairs at anterior end



## Childers canegrub

### *Antitrogus parvulus*

#### Description

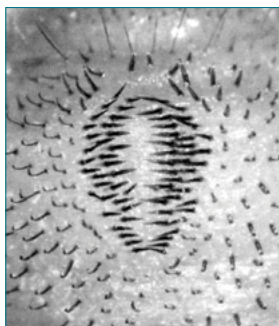
- Adults 18-23 mm long, shining yellow-brown to nearly black, no hairs or scales dorsally
- Raster almost oval, about 35 long hairs on each side, central naked area oval, blocked by overlapping hairs each end

#### Life cycle, damage

- 2-year life cycle

#### Similar species from the same district

- French's, negatoria and noxia canegrubs have more hairs in raster and two sides of raster are separate with no overlap of hairs at either end



## Consobrina canegrub

### *Lepidiota consobrina*

#### Description

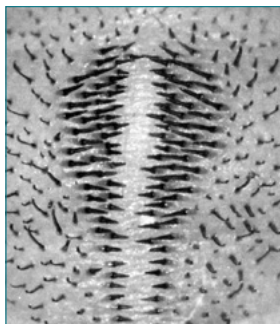
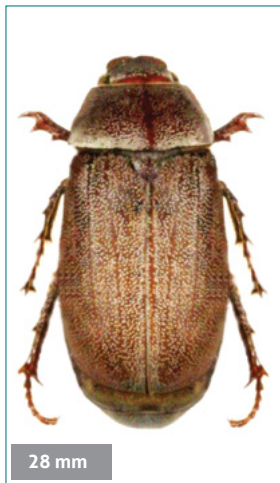
- Adults 25-29 mm long, dark brown, oval white scales across dorsal surface
- Beneath abdomen, more than half length of each segment without scales (p 45)
- Raster pear-shaped, about 50 hairs each side, clear central path, raster tapers to point with two single rows of 5-8 hairs at front

#### Life cycle, damage

- Different populations have either a 1-year or 2-year life cycle

#### Similar species from the same district

- French's and caudata canegrubs: raster doesn't taper to point



North QLD / Damage in spring-summer (2-year variant) or autumn-winter (1-year variant)

\$\$\$

Mossman-Gordonvale / Mostly in dark sandy loams

## French's canegrub

### *Lepidiota frenchi*

#### Description

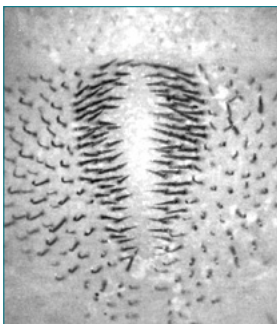
- Adults 22-29 mm long, dark brown, round white scales on dorsal surface, scales on second last abdominal segment of differing size (p 45)
- Beneath abdomen, less than half length of each segment bare (p 45)
- Raster pear-shaped, about 50 long hairs each side, clear central path

#### Life cycle, damage

- 2-year life cycle

#### Similar species from the same district

- Consobrina canegrubs: raster tapers to point
- Caudata and Childers canegrubs: fewer hairs in raster
- Negatoria, noxia canegrubs: larvae indistinguishable with certainty, rear to adult or test DNA



QLD from Bundaberg north / Damage in spring-summer

\$\$\$

Uncommon at Bundaberg, widespread further north / Forest loams and red volcanic soils, often on sandy ridges

## Froggatt's canegrub

### *Lepidiota froggatti*

#### Description

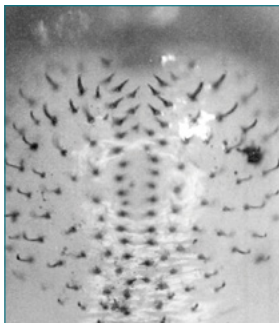
- Adults very large, 30-38 mm long, felted brown colour due to covering of yellow-brown hairs
- Larvae large, shiny dark brown head
- Raster with 12-23 thick hairs each side, single row at front, pattern fans out at rear with a secondary inner row of smaller hairs

#### Life cycle, damage

- 2-year life cycle

#### Similar species from the same district

- None





## Grata canegrub

### *Lepidiota grata*

#### Description

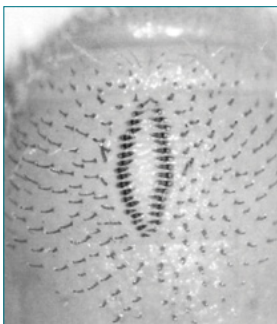
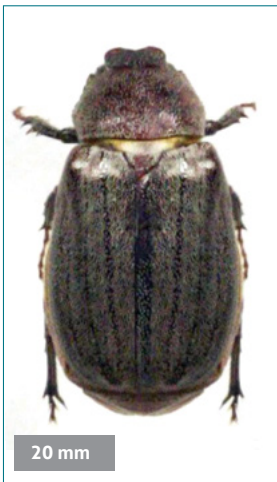
- Adults small, 18-22 mm long, dark brown, uniformly covered with round white scales on dorsal surface
- Raster with two slightly curved single rows of 18-26 hairs

#### Life cycle, damage

- 1- and 2-year life cycles occur together depending on conditions

#### Similar species from the same district

- Small (second instar) greyback canegrubs are similar in size to third instar grata but greyback raster has thinner hairs further apart within each row



## Greyback canegrub

### *Dermolepida albohirtum*

#### Description

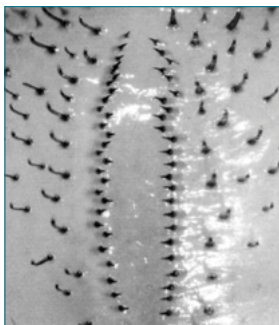
- Adults large, 24-33 mm long, coloured grey by coat of hairs, dark brown patches appear as hairs wear away
- Raster with two, almost straight, single rows of 20-28 short hairs

#### Life cycle, damage

- 1-year life cycle
- Affected stools often lodge or easily pulled from ground

#### Similar species from the same district

- Large grata canegrubs similar in size to small greybacks but grata raster has thicker hairs closer together within each row
- Squamulata canegrub has raster straighter, more and thicker hairs



## Grisea canegrub

### *Lepidiota grisea*

#### Description

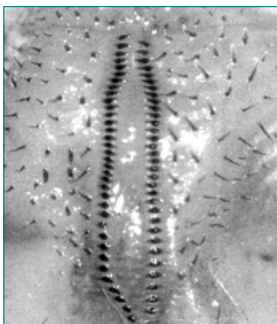
- Adults small, 22-27 mm long, large white scales over dorsal surface
- Raster with two straight single rows of 26-34 short, thick, dark hairs

#### Life cycle, damage

- 1-year life cycle

#### Similar species from the same district

- Greyback canegrub is larger, and raster has thinner hairs further apart within each row



## Nambour canegrub

### *Antitrogus rugulosus*

#### Description

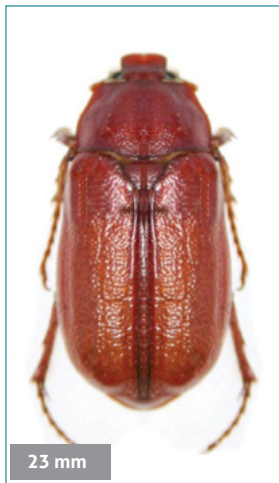
- Adults 20-25 mm long, bright red-brown, with short hairs over dorsal surface, no scales
- Raster with two convex single rows of 19-31 thick hairs

#### Life cycle, damage

- 1-year life cycle

#### Similar species from the same district

- Southern one-year canegrubs appear identical but distributions do not overlap



# Negatoria canegrub

## *Lepidiota negatoria*

### Description

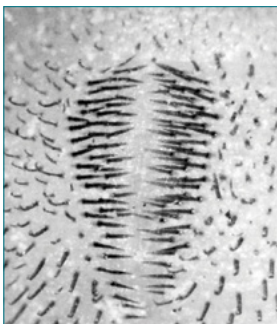
- Adults 21-28 mm long, dark red-brown, spotted with round white scales on dorsal surface, scales on rear angles of second last dorsal abdominal segment are same size as those towards centre (p 45)
- Raster pear-shaped, about 50 long hairs each side

### Life cycle, damage

- 2-year life cycle

### Similar species from the same district

- Childers canegrub has fewer hairs in raster
- French's and noxia canegrubs indistinguishable with certainty, rear to adult or conduct DNA test



QLD from Proserpine south / Damage in spring-summer  
Forest loams and red volcanic soils / Often on sandy ridges

\$\$\$

## Noxia canegrub

### *Lepidiota noxia*

#### Description

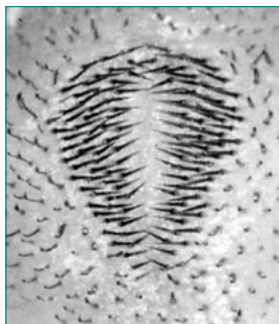
- Adults 22-28 mm long, dark red-brown, sparse oval white scales on dorsal surface
- Raster pear-shaped, about 50 long hairs each side

#### Life cycle, damage

- 2-year life cycle
- Damage in first year of cycle

#### Similar species from the same district

- Childers canegrub has fewer hairs in raster, on heavier soil
- French's and negatoria canegrubs indistinguishable with certainty, rear to adult or conduct DNA test
- Head capsule width slightly less than French's/negatoria, probably noxia if less than 7.0 mm in final instar



South QLD / Damage in late summer and autumn (later than negatoria)  
Sandy loams (usually duplex)

\$\$

## Picticollis canegrub

### *Lepidiota picticollis*

#### Description

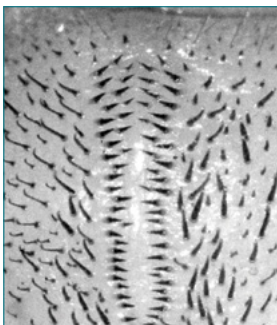
- Adults large, 25-32 mm long, shiny yellow-brown to chestnut, dorsal surface bordered in dark brown or black
- Most have an orange-red patch each side of thorax behind head
- Raster with two parallel rows, each with 29-40 short thick hairs, sometimes with a short second row of a few hairs at posterior end

#### Life cycle, damage

- 2-year life cycle
- Damage in first year of cycle (similar to southern one-year canegrub)

#### Similar species from the same district

- None



## Planiceps canegrub

### *Antitrogus planiceps*

#### Description

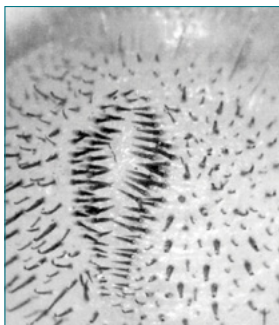
- Adults 18-21 mm long, tan to black, without scales
- Raster pear-shaped, 32-39 long thin hairs mostly in two rows each side but continuing forward as single lines
- Grubs with fewer hairs in raster lack part of the anterior portion of the rows

#### Life cycle, damage

- Life cycle unknown
- Large grubs in fields in early summer

#### Similar species from the same district

- None





# Plectris canegrub

## *Plectris aliena*

### Description

- Adult relatively small, 10-15 mm long, pale yellow-brown
- Raster vase-shaped, with multiple rows of hairs each side of the naked central area

### Life cycle, damage

- Life cycle uncertain, possibly 2 years
- Large larvae present autumn-winter, possibly all year

### Similar species from the same district

- None



## Rhopaea canegrub

### *Rhopaea magnicornis*

#### Description

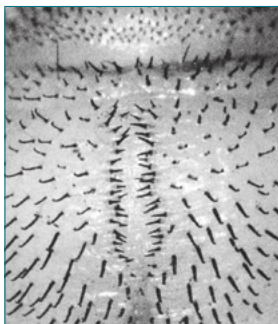
- Adults 21-30 mm long, dark brown, coated with short, fine, semi-erect hairs
- Raster with two parallel single rows of about 20 short hairs

#### Life cycle, damage

- 1- or 2-year life cycle depending on weather
- Damage in autumn-winter (1-year type) or in spring-summer (2-year type) after a cool autumn

#### Similar species from the same district

- None



# Rothe's canegrub

## *Lepidiota rothei*

### Description

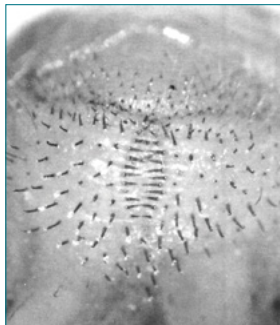
- Adults small, 15-19 mm long, darker than adults of French's canegrub, no hairs beneath thorax
- Raster with two slightly curved rows of 10-12 elongate hairs, hairs from each side almost meet in centre

### Life cycle, damage

- 1-year life cycle, overwintering as second instar larvae

### Similar species from the same district

- May be mixed and confused with damaging species
- *Grata*, greyback and *squamulata* canegrubs have more hairs in raster and shorter/stouter hairs



Burdekin north / No cane damage recorded

Often in grassy fields and fallows

## Sororia canegrub

### *Lepidiota sororia*

#### Description

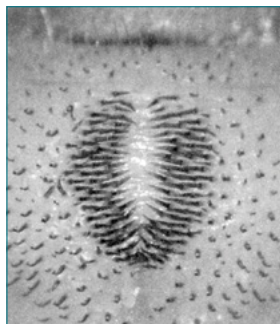
- Adults relatively small, 19-22 mm long, light brown with white markings on abdomen due to densely packed body scales
- Raster almost circular, with about 45 long hairs each side, hairs almost meet at front end

#### Life cycle, damage

- Probably a 1-year life cycle

#### Similar species from the same district

- None



Ingham north / Damage in autumn-winter

Light duplex soils, often waterlogged in wet season

§

## Southern one-year canegrub

### *Antitrogus consanguineus*

#### Description

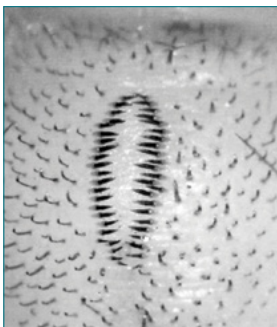
- Adults 20-25 mm long, bright red-brown, with short hairs over dorsal surface, no scales
- Raster with two convex single rows of 19-31 thick hairs

#### Life cycle, damage

- 1-year life cycle

#### Similar species from the same district

- Nambour canegrubs appear identical but their distributions do not overlap



Maryborough-Bundaberg / Damage in autumn-winter  
Sandy soils

\$\$\$

## Squamulata canegrub

### *Lepidiota squamulata*

#### Description

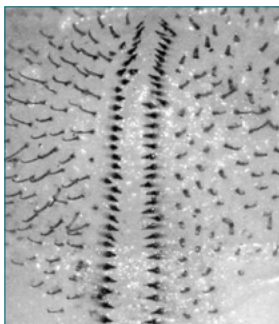
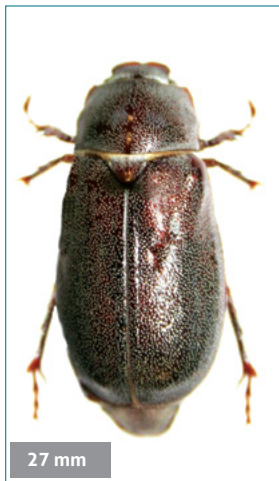
- Adults 22-32 mm long, dark-coloured with oval white scales, esp. along sides and underneath
- Raster with two straight single rows of 28-40 short, thick hairs, hair lines diverge slightly at front end

#### Life cycle, damage

- 1-year life cycle

#### Similar species from the same district

- Greyback canegrub has raster with raster usually more curved with fewer and thinner hairs



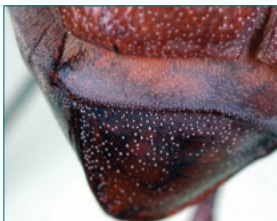
## Distinguishing similar cane beetles

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### Consobrina

Broad bare band beneath each segment



### Negatoria

Scales on second-last dorsal abdominal segment (behind wing covers) small, uniform in size and well-separated



### French's

Narrow bare band beneath each segment



### French's

Scales along posterior margin of second-last dorsal abdominal segment much larger and more crowded than those in front of them

## Christmas beetles

### *Anoplognathus* spp.

#### Description

- Adults glossy, metallic, usually biscuit-coloured, often with green or rose sheen, with brown longitudinal flecks on wing covers
- Larvae without raster
- Larval head tan-coloured, no pits

#### Damage

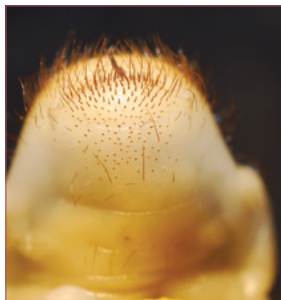
- Larvae chew roots, causing poor ratooning
- Significant damage to standing crop only when large numbers present

#### Diagnosis

- Root damage, esp. hair roots
- Presence of larvae
- Slow build-up of symptoms over years

#### Similar species

- True canegrubs have a raster pattern
- Redheaded grubs have darker reddish heads with pits
- Christmas beetle larvae can crawl on stomach



All regions / Damage in spring

Usually sandy soil

§



## Redheaded whitegrub

### *Dasygnathus dejeani*

#### Description

- Adults broad with short horn on head, glossy, reddish brown
- Larvae without raster
- Head of larva dark reddish brown, with many small pits

#### Damage

- Larvae feed on organic matter in soil
- Larvae burrow into old setts and stubble
- No effect on crop growth

#### Diagnosis

- Often occurs with true canegrubs

#### Similar species

- True canegrubs have a raster pattern
- Christmas beetle larvae have tan-coloured heads without pits
- Redheaded grubs feel firm, maintain C-shape, rarely bite



All regions / No damage

Most soil types including heavy soil

## Soldier flies

**Sugarcane soldier fly,**  
*Inopus rubriceps*

**Yellow soldier fly, *I. flavus***

### Description

- Adults to 12 mm long; male: grey to black; female: black body with orange-red head (Sugarcane SF), or orange-yellow body (Yellow SF)
- Larvae to 14 mm, legless, tough ribbed skin, bristly hairs, white to brown, tiny dark head
- Pupae same as larvae

### Damage

- Larvae suck juice from roots, perhaps inject toxin

### Diagnosis

- Gappy ratoons, outside stools often healthy
- Larvae under stools
- Pupal cases under trash after May
- Pits in roots

### Similar symptoms or species

- None



Sugarcane soldier fly male (left) and female (right).



NSW, QLD (all regions, esp. south and central) / Damage mostly seen soon after harvest / Larvae all year, esp. September-April / Adults autumn

Wide range of soils

## Ground pearls (Margarodids)

**Pink ground pearl,**  
*Eumargarodes laingi*

**White ground pearl,**  
*Promargarodes australis*

### Description

- Adults pink or white, soft, wingless, with stout hooked forelegs
- Nymphs in soil enclosed in cysts (pearls) – hard, glossy white-yellow (White GP) or tough, matte cream-brown (Pink GP)

### Damage

- Nymphs suck from roots
- Pink GP is the more-damaging species

### Diagnosis

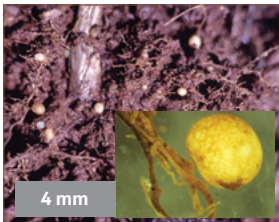
- Poor growth patches, stunted cane, yellow leaves, poor ratoons
- Large numbers (100s) of cysts in soil

### Similar symptoms or species

- Adult mealybugs have powdery coating, simple forelegs



Adult pink (left) and white (right) ground pearls.



Ground pearl cysts.



Pink GP south QLD and NSW; White GP all regions / Cysts all year  
Adults on top of soil spring-summer

\$\$

Pink GP in red volcanic soils and sands / White GP most soils

## Cicadas

**Brown sugarcane cicada,**  
*Cicadetta crucifera*

**Green cicada, *C. multifascia***

**Yellow sugarcane cicada,**  
*Parnkalla muelleri*

### Description

- Adults to 18 mm long (body only)
- Yellow cicada with Z-mark on forewings
- Nymphs whitish with large digging forelegs, in soil

### Damage

- Nymphs suck juice from roots

### Diagnosis

- Poor/failed ratoons
- Nymphs and/or tunnels among roots
- Empty skins on cane after adults emerge

### Similar symptoms or species

- None



Cicada nymph in tunnel in soil.



All regions (brown and yellow), Gin Gin (green) / Adults Nov-Feb  
Nymphs May-Nov

\$\$

Loam and clay soils

## Funnel ant

### *Aphaenogaster pythia*

#### Description

- Ants honey-coloured, with pair of dorsal spines at rear of thorax; workers to 5 mm long; sexual forms larger
- Form mounds to 25 cm wide and 20 cm high with funnel-shaped opening at top

#### Damage

- Weakened growth via loosened soil, moisture stress
- Stool removal due to reduced anchorage
- Poor cane growth due to other causes may encourage funnel ants

#### Diagnosis

- Gappy ratoons
- Presence of mounds and ants

#### Similar symptoms or species

- Other ants may differ in colour/size or lack the spines on the thorax



Sexual forms and worker (far right).



Mostly in wet tropics / Present all year

\$

Mainly gravel loams and sandy clay loams, esp. former blady grass country

# Symphyla

## *Hanseniella* spp.

### Description

- Small, to 10 mm long, centipede-like, white or cream
- Long slender antennae, 6 pairs of legs when young increasing to 12 pairs at maturity



### Damage

- Round holes eaten into primordia at root tip and along root



Root shortening and coraloid branching, pit at bottom right.

### Diagnosis

- Poor stooling, wilting of tops
- Poor root system with coraloid branching
- Small (0.5-1.0 mm diameter) cylindrical pits in roots
- Symphyla in soil (shake onto black plastic)



### Similar symptoms or species

- Pits from soldier fly more conical

All regions / In young plant and ratoon crops

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Loose or cracking soils

## Wireworms

*Heteroderes* spp.

*Conoderus* spp.

Sugarcane wireworm,  
*Agrypnus variabilis*

### Description

- Adults are click beetles, variable size to 15 mm long
- Larvae to 20 mm long, slightly flattened, creamy-white, orange head, hard flattened or dished tail plate with rear-pointing spines

### Damage

- Larvae bore into buds or base of young shoots

### Diagnosis

- Poor/patchy germination, dead hearts
- Small (< 2.5 mm) circular holes in buds or shoots below ground

### Similar symptoms or species

- Moth borer entry holes are above ground, with tunnels in shoots



All regions / Larvae all year, damage mainly in autumn-plant cane  
All soil types, esp. poorly drained parts of fields

\$\$

## Black beetles

**African black beetle,**  
*Heteronychus arator*

**Black beetle, *Metanastes vulgivagus***

### Description

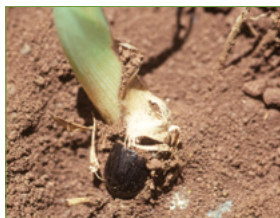
- Adults shiny black above, wing cases ribbed
- Black beetle larger, about 15 mm long, with pair of knobs behind head
- Larvae to 30 mm, grey-white, head rough-surfaced and dark red-brown, no raster



Black beetle head/thorax, with African species on left.

### Damage

- Beetles chew deep ragged holes at base of young shoots



### Diagnosis

- Dead hearts
- Characteristic feeding damage

### Similar symptoms or species

- Most other pests make small neat holes in shoots



Native BB all regions, introduced African BB from Maryborough south  
Adults active in autumn and spring, damage mainly in spring

\$\$

Most soils / African BB often in caneland newly planted into former grassland



## Leaf beetles (Rhyparida)

**Black leaf beetle,**  
*Rhyparida nitida*

**Sugarcane leaf beetle,**  
*R. dimidiata*

### Description

- Adults to 7 mm long, *R. nitida* shiny black, *R. dimidiata* brown
- Larvae to 9 mm long, yellow-grey body, shiny red-brown head

### Damage

- Larvae bore into base of young shoots
- Beetles eat small holes in leaves (cane growth unaffected)

### Diagnosis

- Dead hearts
- Larvae in soil
- Characteristic adult feeding marks

### Similar symptoms or species

- Damage similar to moth borer and wireworm but larvae distinctive



*Rhyparida dimidiata*.



*Rhyparida nitida*.



QLD, damage mostly in south / Larval damage in young ratoons in spring, \$ \$ adults in summer (1-year life cycle)

Damage more common in grassy fields

## Sugarcane butt weevil

### *Leptopius maleficus*

#### Description

- Weevil adults 16-21 mm long, grey or reddish, with many rounded lumps
- Larvae legless, slightly curled, small head, taper to rear, cream-yellow with pale head and black mouthparts

#### Damage

- Larvae gouge setts and base of young shoots and older stalks
- Adults eat leaves of rattlepod, causing a tattered appearance

#### Diagnosis

- Dead hearts in young shoots
- Weakened semi-mature stalks
- Larvae in soil

#### Similar symptoms or species

- Weevil borer larvae have red-brown head, enlarged abdomen



## Stenocorynus weevils, Whitefringed weevil

### *Stenocorynus* spp.

#### Whitefringed weevil, *Naupactus leucoloma*

#### Description

- Adults about 10 mm long
- Stenocorynus adults light brown with darker brown stripes
- Whitefringed weevil adults light brown with white line on outer edge of wing covers
- Larvae of both species stout, up to 15 mm long, legless, white to pale yellow with pale yellow heads, black mouthparts

#### Damage

- Larvae chew roots, root bands and buds

#### Diagnosis

- Poor germination and/or ratooning, weak cane growth

#### Similar symptoms or species

- None



Adult Stenocorynus weevil.



Adult whitefringed weevil.

Widespread / At planting or ratooning

\$

Damage from whitefringed weevil often follows legume cover crops

## Large moth borer

### *Bathytricha truncata*

#### Description

- Moths dull-coloured, with small dots in lines inside edge and near centre of forewings
- Larvae to 40 mm long, purple-pink tint when mature, small black spots



#### Damage

- Larvae tunnel inside shoots or young internodes of stalks

#### Diagnosis

- Dead hearts
- Vertical tunnels
- Wet frass
- Larvae (if present) in shoots, esp. in shoots where inner leaves just starting to wilt



#### Similar symptoms or species

- Wireworms – no vertical tunnels
- Weevil borers – tunnels contain fibrous material
- Black beetles – rough gouging



All regions / Most common in spring or early summer in young shoots

\$

Damage more common on field edges, esp. near couch or crowsfoot grass

## Sugarcane bud moth

### *Opogona glycyphaga*

#### Description

- Adult moths 8 mm long, shiny purple head and thorax, wings yellow with purple tips
- Larvae to 16 mm long, dull yellow with dark blotches, dark red-brown head, body with long hairs

#### Damage

- Larvae attack buds on standing cane
- Can attack buds and/or shoots if planted with setts

#### Diagnosis

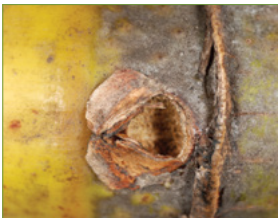
- Germination failure and/or dead hearts
- Hollow buds
- Root band eaten out around node
- Larvae and pupal cases beneath leaf sheaths

#### Similar symptoms or species

- None



Pupal case.



All regions, esp. central and north QLD / Damage to standing cane in autumn \$  
Some varieties more prone to damage

## Field crickets, Mole cricket

Oceanic field cricket,  
*Teleogryllus oceanicus*

Black field cricket,  
*T. commodus*

Mole cricket, *Gryllotalpa* sp.

### Description

- Field cricket shiny black or brown, long antennae, jumping hindlegs
- Mole cricket strong-bodied, 25-30 mm long, velvety dark brown short hairs, short forewings, long cerci, broad digging forelegs

### Damage

- Adults and nymphs eat eyes and young shoots

### Diagnosis

- Gappy stands in plant cane
- Swelling eyes scooped out cleanly (field cricket)
- Holes bored in setts (mole cricket)
- Ragged holes in shoots

### Similar symptoms or species

- Shoot damage similar to black beetle



Black field cricket.



Mole cricket.



Mole cricket damage.

All regions, esp. Burdekin / Mostly seen during planting season

\$

Common in wet, cracking clays

## Sugarcane weevil borer

### *Rhabdoscelus obscurus*

#### Description

- Adults 12-15 mm long, curved snout, tan and dark brown wing-covers
- Larvae legless, swollen in middle and tapering to rear, cream-coloured, red-brown head



#### Damage

- Larvae tunnel in mature stalks with reddening of internal tissues, causing reduction in stalk weight/ CCS, stalk breakage



#### Diagnosis

- Large tunnels, esp. at stalk base
- Round holes in rind
- Coarse frass packed in tunnels
- Fibrous cocoons

#### Similar symptoms or species

- Moth borers (caterpillars) have legs, wet frass, no cocoons



Central and north QLD / Adults most active in summer and autumn  
Weevils attracted to stressed/damaged cane

\$\$

## Termites

### Giant termite, *Mastotermes darwiniensis*

#### Minor species

#### Description

- Giant termite: workers 10-12 mm long; soldiers slightly longer with larger head; winged reproductives to 18 mm, white

#### Damage

- Adults eat inside of setts/standing cane

#### Diagnosis

- Hollowed setts/stalks
- Presence of 'white ants'

#### Similar symptoms or species

- None



Giant termite in Burdekin, other species all regions / All year

\$

Damage to cane most common when timber is nearby



## Locusts

Australian plague locust, *Chortoicetes terminifera*

Migratory locust, *Locusta migratoria*

Spur-throated locust, *Nomadacris guttulosa*

Yellow-winged locust, *Gastrimargus musicus*

### Description

- Swarming grasshoppers of variable colour and size, nymphs (hoppers) lack wings

### Damage

- All stages eat leaves, causing reduced cane growth, poor canopy closure/weeds

### Diagnosis

- Raggedly eaten leaves
- Presence of nymphs or adults
- Adult colour/form/size identifies species

### Similar symptoms or species

- Armyworm damage similar – identify causal pest



Spur-throated locust.



All regions, species vary region to region / Damage in summer

\$\$

Damage in plant and ratoon cane, occurrence very sporadic

## Night-feeding armyworms

Sugarcane armyworm,  
*Leucania stenographa*,  
*L. loreyi*, *L. abdominalis*  
Common armyworm,  
*Mythimna convecta*  
Northern armyworm,  
*M. separata*

### Description

- Adults grey-brown moths, difficult to separate species (p 65)
- Larvae greenish or brownish with faint to defined stripes

### Damage

- Larvae eat leaves, causing reduced growth in severe infestations

### Diagnosis

- Eaten leaves, often with only midrib left
- Larvae in spindle or under trash during day, curl up when disturbed, pupae in trash or soil

### Similar symptoms or species

- Day-feeding armyworms more striped, with Y-mark on head, on plants during day
- Locust damage – identify causal pest



All regions / Damage in late winter to early summer

\$

Usually on small ratoons with trash / Larvae often heavily parasitised/diseased

## Night-feeding armyworm identification

*L. stenographa*



35 mm wingspan

Dark line along forewing well defined.



40 mm

Dark line along body well defined. General colour dark brown.

*L. loreyi*



35 mm wingspan

Line along forewing faint – not well defined.



35 mm

Lines along body not well defined. General colour pinkish olive green.

*L. abdominalis*



30 mm wingspan

No clear pattern on forewing. Ground colour pale bronze. Forewing has distinctive sheen.



35 mm

Dark lines along body dotted, with a white mottled pattern along body.

*M. separata*



35 mm wingspan

Ground colour rose gold. Hindwing with wide brown edge.

## Day-feeding armyworm

### *Spodoptera exempta*

#### Description

- Adult forewings dark with small white lines centrally, hindwings pale with dark border
- Larvae green with dark green, almost black, stripes, pale inverted Y-mark on front of head

#### Damage

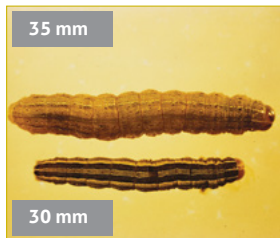
- Larvae eat leaves, causing reduced growth in severe infestations
- Often on larger plants than night-feeders

#### Diagnosis

- Eaten leaves, often with only midrib left
- Larvae on leaves during day

#### Similar symptoms or species

- Night-feeding armyworms less striped, without Y-mark on head, under trash during day
- Locust damage – identify causal pest



Day-feeding armyworm (bottom) compared with night-feeding armyworm (top).

All regions, more common in central-north / Damage mainly in summer

\$

Occurs less frequently than night-feeding armyworms, often on larger cane

## Sugarcane planthopper

### *Perkinsiella saccharicida*

#### Description

- Adults 5 mm long, brown-black, taper to rear from broad head
- Often move sideways ('sidewinders')
- Juveniles similar, plump, wingless

#### Damage

- Direct sucking injury – minor
- Vector of Fiji leaf gall

#### Diagnosis

- Presence of adults in leaf whorl, beneath young leaf sheaths or under leaves
- Red egg punctures in mid-ribs or in sheathing leaf bases, wax cap over punctures

#### Similar symptoms or species

- Island planthoppers (*Eumetopina*) smaller, thinner, black



All regions / Most abundant in summer-autumn

\$

Economically significant only as disease vector / Numbers differ among cane varieties

## Island planthopper

### *Eumetopina flavipes*

#### Description

- Adults 4-5 mm long, black
- Juveniles wingless, pale colour
- In Australia, known only from northern Cape York Peninsula and Torres Strait islands

#### Damage

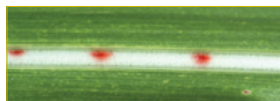
- Suck from leaves, causing yellowing at high numbers
- Vector for Ramu stunt disease in PNG (virus not recorded in northern Australia)

#### Diagnosis

- Adults and nymphs in leaf whorl
- Multiple red egg punctures in midribs

#### Similar symptoms or species

- Sugarcane planthoppers (*Perkinsiella*) larger, broader, more grey than black



Egg punctures in midrib.

Far north only / Most abundant in wet season

\$

Not in commercial cane in Australia

# Sugarcane froghopper

## *Euryaulax carnifex*

### Description

- Adults 8 mm long, orange and purple-black markings
- Nymphs yellow or pink within mass of foam ('spittle'), on stilt roots above ground and roots below ground



### Damage

- Adults suck sap from leaves, causing leaf streaks in vascular bundles, initially yellow, then redden as tissue dies
- Scorching usually extends to margin, leading to dead leaf tips



### Diagnosis

- Leaf symptoms
- Adults on upper leaf surfaces

### Similar symptoms or species

- None

North QLD, esp. Tully and Herbert / Mainly in summer and autumn \$  
Mainly on cracking clay or loose-structured soils / Also on cotton and kenaf

## Linear bug

### *Phaenacantha australiae*

#### Description

- Adults slender, to 9 mm long, orange-brown to dark green-brown
- Nymphs similar, wingless, orange-yellow

#### Damage

- Feeding punctures, causing yellow leaves with dry tips and dead margins
- Purpling of leaves with sun exposure

#### Diagnosis

- Leaf symptoms (may be confused with nutrient deficiency)
- Long thin adults

#### Similar symptoms or species

- None



Sarina north / Most abundant in spring, under dry conditions  
Often in grassy fields

\$



## Pink sugarcane mealybug

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### *Saccharicoccus sacchari*

#### Description

- Adults to 5 mm long, soft, oval, pink, wingless
- Covered with white powder
- All legs similar

#### Damage

- Sucking damage may weaken cane
- Sooty mould often present

#### Diagnosis

- Colonies behind leaf sheath and on stubble underground

#### Similar symptoms or species

- Scale insects also behind sheaths but are hard, not pink
- Adults of pink ground pearl have forelegs strongly hooked and different from other legs



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All regions / Occurs all year, persists on stubble between crop cycles \$  
Little direct economic significance / May contribute to sugar quality problems

---

## Aphids

Sugarcane aphid,  
*Melanaphis sacchari*

Corn aphid,  
*Rhopalosiphum maidis*

Oriental grassroot aphid,  
*Tetraneura nigriabdominalis*

### Description

- Sugarcane and corn aphids tiny, yellow or black, with pair of tubes (siphunculi) near rear end
- Oriental grassroot aphids colonise roots

### Damage

- Sugarcane aphids suck from leaves, causing yellow patches, dried leaves
- Excrete honeydew, causing sooty mould
- Corn aphids vector sugarcane mosaic, rarely colonise cane

### Diagnosis

- Colonies beneath leaves, attending ants, honeydew, sooty mould

### Similar symptoms or species

- Mite symptoms: mites smaller, 8 legs, no siphunculi



Cane with sooty mould.

All regions / More common in summer under dry conditions

\$

Many parasitoids and predators (e.g. ladybirds) keep numbers in check

## Spider mites

### *Oligonychus zanclopes*

Possibly other species

#### Description

- Pale green, dark spots either side of body, 8 legs

#### Damage

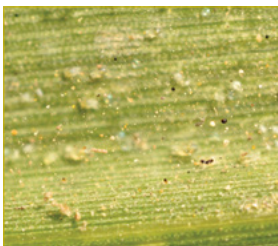
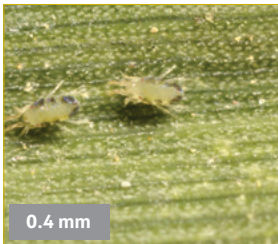
- Feeding scars, cause leaf discolouration
- Mites and symptoms usually disappear during wet season

#### Diagnosis

- Rusty bands along leaves
- Mites beneath leaves (not always present)
- Cast skins, webbing

#### Similar symptoms or species

- Damage resembles orange rust, distinguished by mites, webbing or cast skins
- Aphids larger, have 6 legs, no webbing or rusty symptoms
- Silicon-deficiency symptoms similar on top of leaves ('sunny-side up', 'orange freckle')



Mite webbing.



All regions / Common mid-summer, numbers crash by February

\$

Populations controlled by biological control from predators and disease

## Sugarcane scale

### *Aulacaspis madiunensis*

#### Description

- Adult insects hidden below flat, circular, pale-green to grey scale to 3 mm diameter, not mobile
- Newly hatched crawlers difficult to see



#### Damage

- Insects suck sap, causing weakened growth, shrivelled stalk tissues

#### Diagnosis

- Presence of scales on stalk

#### Similar symptoms or species

- Pink sugarcane mealybugs also infest stalks but have a white powdery coating, not a hard scale



All regions, pest only in south / Occur all year

\$

Colonies most prominent on mature cane

## Rarely seen pests

---



5 mm

### Ratoon shootborer *Ephysteris promptella*

Larvae bore into base of young ratoon shoots, causing dead hearts, pinhole entry holes under basal sheaths.

Central and north QLD.



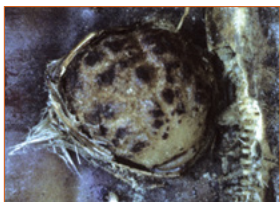
30 mm

### Sugarcane looper *Mocis frugalis*

Larvae with only 2 pairs of prolegs, move with looping motion.

Feed on leaves during day.

All regions.



### Wart-eye mite (unidentified species)

Not visible to the naked eye. Buds swell beneath scale, become rough, causing poor germination.



1-2 mm

### Sugarcane whitefly *Neomaskellia bergii*

Winged adults.

Colonies beneath leaves.

## Oriental rice thrips

### *Stenchaetothrips biformis*

#### Description

- Insects tiny, slender, black
- Antennal segments 4-7, dark

#### Damage

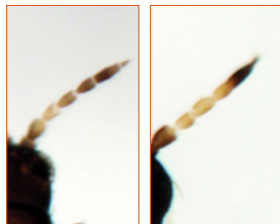
- Curling and drying of the leaf tips of very young plants
- Young leaves not unfurling properly

#### Diagnosis

- Leaf symptoms (may be confused with nutrient deficiency or water stress)
- Tiny black insects in whorl

#### Similar species

- Oriental sugarcane thrips (*Fulmekiola serrata*), an exotic species not present in Australia: antennal segments 3-5 and base of 6 are pale



Antennae of Oriental rice thrips (on left) and Oriental sugarcane thrips (on right).

So far known only from near Gordonvale / Easily confused with the exotic pest species Oriental sugarcane thrips

Watch should be kept on possible expansion of range or pest status

## Canefield or ground rat

---

### *Rattus sordidus*

#### Description

- Coarse spiny coat grizzled dark brown to black
- Tail dark brown to black, usually shorter than body and with pronounced scale rings

#### Damage

- Chewing of stalks usually within 20 cm of ground, causing broken stalks, reduced tonnage, reduced sugar content, rotting of stalks

#### Diagnosis

- Bitten stalks near ground level, stalk breakage and sprawling
- Burrows in ground

#### Similar symptoms or species

- Climbing rats cause damage higher on stalks, appear thick-necked with mosaic-scaled tail



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Mostly central and north regions / Damage greatest in autumn-winter  
Grass is preferred food / Rely on cane when other food is unavailable

---

\$\$

## Climbing rats

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**Grassland melomys,**  
*Melomys burtoni*

**Fawn-footed melomys,**  
*Melomys cervinipes*

### Description

- Grey to red-brown, belly white, grey or cream, juveniles often grey
- Tail dark grey, brown or black, slender and tapering, with mosaic pattern of scales

### Damage

- Chewing of stalks, often at height of about 1.5 m, causing broken stalks, reduced tonnage, reduced sugar content, rotting of stalks

### Diagnosis

- Bitten stalks near growing point, often bent at bite mark
- Nests in canopy

### Similar symptoms or species

- Ground rats have scale rings on tail



*Melomys burtoni.*



*Melomys cervinipes.*



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Mostly north and some central regions / Damage mostly late autumn

\$\$

Damage often around perimeter of fields near grass/forested riverine harbourage

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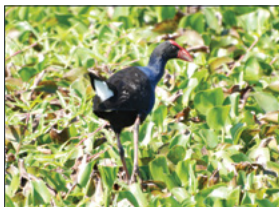


## Other animals and birds

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**Cockatoo:** Large stalks bitten off, all at same height, on edge of field.



**Eastern swamphen:** Pith scooped out.



**Bush turkey:** Stalk hollowed out leaving 'canoe-shaped' hole in rind.

**Wallaby:** Eaten shoots or dug-up setts.

**Feral pig:** Broken and chewed stalks, flattened cane, uprooted stools, damage often not visible from headland.

**Fox:** Chewed stalks.

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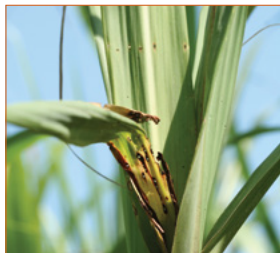
## Exotic insect pests

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Australia is free of many insect pests that damage sugarcane in other countries. Chief among these are the moth borers, which are major pests in most countries except Australia. Some exotic pests from Papua New Guinea are illustrated below. These pose a biosecurity risk to Australia, a risk minimised through quarantine, research and efficient incursion management plans.



Young internodes infested with *Sesamia grisescens* – a stalk borer.



Cane top killed by *Scirpophaga excerptalis* – a top borer.



*Chilo terrenellus* – a stalk borer.



Woolly aphid – a leaf-sucking pest.

## Canegrub biocontrol agents



Canegrub affected by *Metarhizium* fungus.



Canegrub (on right) affected by *Adelina* (protozoan), healthy grub on left.



(Above) Canegrub on the right affected by milky disease (bacterium), healthy grub on left.



(Left) *Campsomeris* (adult and cocoon), a burrowing wasp – a parasitoid of canegrubs.

## Biocontrol agents of other insect pests

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Many insect pests of sugarcane are kept under control by a range of naturally occurring biological control agents: predators, parasitoids and pathogens. A few of these are illustrated below but there are many more, including ants and even wireworms. Biocontrol can be disrupted by indiscriminant use of broad-spectrum pesticides.



*Cordyceps* – a fungal disease of cicadas.



Cocoons of the parasitoid *Cotesia nonagriæ* emerged from a larva of large moth borer.



Ladybird beetle (above) and larva (above right), and hover fly larva (right) – predators of aphids, other sucking insects, and mites.



# Glossary

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<b>Abdomen</b>	In insects, the rear-most part of the body, behind the thorax
<b>Antennae</b>	Sensory structures at the front of the insect's head (= 'feelers')
<b>Biocontrol</b>	(= biological control) Control of pest populations that is exerted by natural enemies, the complex of predators, parasitoids and pathogens that attack the pest
<b>Caterpillar</b>	The larva of a moth or butterfly
<b>Cerci</b>	Paired appendages on the rear-most segment of many insects
<b>Convex</b>	Curved like the outside of a sphere
<b>Coralloid</b>	Branching in a shape resembling coral
<b>Dead heart</b>	Dead juvenile or spindle leaves in the central portion of the cane shoot or stalk, caused by death of the growing point
<b>Dorsal</b>	Upper or top, as in dorsal surface
<b>Frass</b>	Solid debris or excrement produced by feeding insects
<b>Germination</b>	Sprouting, here used to describe the initial production of shoots from buds on planting setts or ratoon stubble
<b>Growing point</b>	The part of a plant where cells divide to produce new growth
<b>Honeydew</b>	Sugary liquid waste produced by some sucking insects, e.g. aphids
<b>Instar</b>	Developmental stage of insect larvae or nymphs between each moult; the stage hatching from the egg is the first instar

# Glossary

---

<b>Invertebrate</b>	An animal without a backbone, e.g. insects and mites
<b>Larva</b>	(Plural = larvae) The immature stage of an insect that goes through complete metamorphosis after hatching from the egg and so is very different from the adult, e.g. caterpillar, grub, maggot
<b>Metamorphosis</b>	Change in form from egg to adult, can be either complete (egg – larva – pupa – adult, e.g. canegrubs) or incomplete (egg – nymph – adult, e.g. grasshoppers)
<b>Mite</b>	Small 8-legged invertebrate, not an insect
<b>Nymph</b>	The immature stage of an insect that goes through incomplete metamorphosis after hatching from the egg and so is similar to the adult but lacks wings, e.g. young locusts (hoppers)
<b>Parasitoid</b>	An insect which lives on or in another host insect and eventually kills it (unlike a parasite which does not usually kill its host)
<b>Pathogen</b>	A micro-organism that causes disease, e.g. bacteria and fungi
<b>Predator</b>	An animal that eats others; it consumes a number of prey individuals to complete its life cycle (unlike a parasitoid)
<b>Pupa</b>	(Plural = pupae) The resting phase between the larval and adult stages of an insect that goes through complete metamorphosis
<b>Raster</b>	The pattern of hairs in front of the anus of canegrubs that can be used to distinguish species

# Glossary

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<b>Ratoon</b>	The cane crop that regrows after harvest
<b>Rodent</b>	Animals in the order Rodentia, which includes native sugarcane pests such as canefield and ground rats as well as introduced rats and mice
<b>Sett</b>	Planting piece of sugarcane stalk (billet)
<b>Siphunculus</b>	(Plural = siphunculi) Small cone-shaped tube on the dorsal surface near the rear of an aphid's abdomen
<b>Sooty mould</b>	A black fungus that grows on plants where honeydew has been deposited by sucking insects such as aphids
<b>Species</b>	A group of similar individuals that are able to interbreed; the basic unit in the classification of plants and animals
<b>Spindle</b>	The central folded leaves at the top of the cane stalk
<b>Stool</b>	A single cane plant
<b>Stubble</b>	The basal portions of the cane plant left in the ground after harvest
<b>Thorax</b>	In insects, the middle (chest) part of the body, between the head and abdomen, and to which the wings and legs are attached
<b>Vector</b>	In insect-plant systems, an insect that transmits disease from one plant to another

# Index

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Page numbers in bold indicate the main references.

## A

Acknowledgments .....	96
<i>Adelina</i> .....	81
African black beetle .....	54
<i>Agrypnus variabilis</i> .....	53
Animals .....	79
<i>Anoplognathus</i> spp.....	46
<i>Antitrogus consanguineus</i> .....	43
<i>Antitrogus parvulus</i> .....	27
<i>Antitrogus planiceps</i> .....	38
<i>Antitrogus rugulosus</i> .....	34
<i>Aphaenogaster pythia</i> .....	51
Aphids .....	13, <b>72</b> , 73, 82
Armyworms .....	12, 18, 63, <b>64-66</b>
<i>Aulacaspis madiunensis</i> .....	74
Australian plague locust .....	63

## B

<i>Bathyricha truncata</i> .....	58
Beneficials .....	<b>81-82</b>
Biological agents .....	15, <b>81-82</b>
Biological control .....	<b>81-82</b>
Biosecurity .....	80
Birds .....	15, 79
Black beetle .....	54
Black beetles .....	9, <b>54</b> , 58, 60
Black field cricket .....	60



# Index

---

Black leaf beetle .....	55
Brown sugarcane cicada .....	50
Bud moth .....	10, 59
Bundaberg canegrub .....	25
Bush turkey .....	79
Butt weevil .....	56

## C

<i>Campsomeris</i> .....	81
Cane beetles – distinguishing similar species .....	45
Canefield rat .....	77, 78
Canegrub damage, 1-year type .....	20, 24
Canegrub damage, 2-year type .....	21, 24
Canegrub distribution .....	23
Canegrub identification .....	24
Canegrub life cycles .....	18, 20-21
Canegrub root damage .....	22
Caudata canegrub .....	26, 28, 29
Childers canegrub .....	27, 29, 35, 36
<i>Chilo terrenellus</i> .....	80
<i>Chortoicetes terminifera</i> .....	63
Christmas beetles .....	24, 46, 47
Cicadas .....	8, 19, 50, 82
<i>Cicadetta crucifera</i> .....	50
<i>Cicadetta multifascia</i> .....	50
Climbing rats .....	77, 78
Cockatoo .....	79
Common armyworm .....	64
Complete metamorphosis .....	18

# Index

---

<i>Conoderus</i> spp.....	53
Consobrina canegrub .....	26, 28, 29, 45
Coralloid branching .....	52
<i>Cordyceps</i> .....	82
Corn aphid .....	72
<i>Cotesia nonagriæ</i> .....	82
Crickets .....	11, 60

## D

<i>Dasygnathus dejeani</i> .....	47
Day-feeding armyworm .....	64, 66
<i>Dermolepida albohirtum</i> .....	32

## E

Eastern swampphen .....	79
<i>Ephysteris promptella</i> .....	75
<i>Eumargarodes laingi</i> .....	49
<i>Eumetopina flavipes</i> .....	67, 68
<i>Euryaulax carnifex</i> .....	69
Exotic insect pests .....	15, 80

## F

Fawn-footed melomys .....	78
Feral pig .....	79
Field cricket .....	60
Fiji leaf gall .....	67
Fox .....	79
French's canegrub .....	26, 27, 28, 29, 35, 36, 45
Frogatt's canegrub .....	30

# Index

---

Froghopper .....	12, 69
<i>Fulmekiola serrata</i> .....	76
Funnel ant .....	9, 51

## G

<i>Gastrimargus musicus</i> .....	63
Giant termite .....	62
Grasshoppers .....	63
Grassland melomys .....	78
Grata canegrub .....	31, 41
Green cicada .....	50
Greyback canegrub .....	31, 32, 33, 41, 44
Grisea canegrub .....	33
Ground pearls .....	8, 49
Ground rat .....	77, 78
<i>Gryllotalpa</i> sp. ....	60

## H

<i>Hanseniella</i> spp. ....	52
<i>Heteroderes</i> spp. ....	53
<i>Heteronychus arator</i> .....	54
Honeydew .....	72
Hover fly .....	82

## I

Incomplete metamorphosis .....	19
Incursion management plans .....	80
<i>Inopus flavus</i> .....	48
<i>Inopus rubriceps</i> .....	48

# Index

---

Insect life cycles .....	18-19
Instars .....	18
Island planthopper .....	67, 68

## L

Ladybird .....	82
Large moth borer .....	10, 53, 55, 58, 61, 82
Leaf beetles .....	10, 55
<i>Lepidiota caudata</i> .....	26
<i>Lepidiota consobrina</i> .....	28
<i>Lepidiota crinita</i> .....	25
<i>Lepidiota frenchi</i> .....	29
<i>Lepidiota froggatti</i> .....	30
<i>Lepidiota grata</i> .....	31
<i>Lepidiota grisea</i> .....	33
<i>Lepidiota negatoria</i> .....	35
<i>Lepidiota noxia</i> .....	36
<i>Lepidiota picticollis</i> .....	37
<i>Lepidiota rothei</i> .....	41
<i>Lepidiota sororia</i> .....	42
<i>Lepidiota squamulata</i> .....	44
<i>Leptopius maleficus</i> .....	56
<i>Leucania abdominalis</i> .....	64-65
<i>Leucania loreyi</i> .....	64-65
Linear bug .....	12, 19, 70
<i>Locusta migratoria</i> .....	63
Locusts .....	11, 19, 63, 64, 66
Looper .....	75

# Index

---

## M

Margarodids .....	8, 49
<i>Mastotermes darwiniensis</i> .....	62
Mealybug .....	13, 49, 71, 74
<i>Melanaphis sacchari</i> .....	72
<i>Melomys burtoni</i> .....	78
<i>Melomys cervinipes</i> .....	78
Metamorphosis .....	18-19
<i>Metanastes vulgivagus</i> .....	54
<i>Metarhizium</i> .....	81
Migratory locust .....	63
Milky disease .....	81
Mites .....	13, 72, 73, 82
<i>Mocis frugalis</i> .....	75
Mole cricket .....	60
Moth borer .....	10, 53, 55, 58, 61, 82
<i>Mythimna convecta</i> .....	64
<i>Mythimna separata</i> .....	64-65

## N

Nambour canegrub .....	34, 43
<i>Naupactus leucoloma</i> .....	57
Negatoria canegrub .....	27, 29, 35, 36, 45
<i>Neomaskellia bergii</i> .....	75
Night-feeding armyworms .....	64-65, 66
<i>Nomadacris guttulosa</i> .....	63
Northern armyworm .....	64-65
Noxia canegrub .....	27, 29, 35, 36

# Index

---

## O

Oceanic field cricket .....	60
<i>Oligonychus zanclopes</i> .....	73
<i>Opogona glycyphaga</i> .....	59
Oriental grassroot aphid .....	72
Oriental rice thrips .....	76
Oriental sugarcane thrips .....	76

## P

Papua New Guinea .....	80
<i>Parnkalla muelleri</i> .....	50
<i>Perkinsiella saccharicida</i> .....	19, 67, 68
<i>Phaenacantha australiae</i> .....	70
Picticollis canegrub .....	37
Pig .....	79
Pink ground pearl .....	49, 71
Pink sugarcane mealybug .....	13, 49, 71, 74
Planiceps canegrub .....	38
Planthoppers .....	12, 19, 67-68
<i>Plectris aliena</i> .....	39
<i>Plectris canegrub</i> .....	39
<i>Promargarodes australis</i> .....	49

## Q

Quarantine .....	80
------------------	----

## R

Ramu stunt .....	68
------------------	----

# Index

---

Rarely seen pests .....	14, 75-76
Raster .....	24
Ratoon shootborer .....	75
Rats .....	77-78
<i>Rattus sordidus</i> .....	77
Redheaded whitegrub .....	24, 46, 47
<i>Rhabdoscelus obscurus</i> .....	61
Rhopaea canegrub .....	40
<i>Rhopaea magnicornis</i> .....	40
<i>Rhopalosiphum maidis</i> .....	72
Rhyparida .....	10, 55
<i>Rhyparida dimidiata</i> .....	55
<i>Rhyparida nitida</i> .....	55
Rodents .....	14, 77-78
Rothe's canegrub .....	41

## S

<i>Saccharicoccus sacchari</i> .....	49, 71
Scale insect .....	14, 71, 74
<i>Scirpophaga excerptalis</i> .....	80
<i>Sesamia griseascens</i> .....	80
Sidewinder .....	67
Siphunculi .....	72
Soldier flies .....	8, 18, 48, 52
Sooty mould .....	71-72
Sororia canegrub .....	42
Southern one-year canegrub .....	34, 43
Spider mites .....	13, 72, 73, 82

# Index

---

<i>Spodoptera exempta</i> .....	66
Spur-throated locust .....	63
Squamulata canegrub .....	32, 41, 44
Stalk borers .....	80
<i>Stenchaetothrips biformis</i> .....	76
<i>Stenocorynus</i> spp. ....	57
Stenocorynus weevils .....	57
Sugarcane and maize stemborer .....	58
Sugarcane aphid .....	72
Sugarcane armyworm .....	64-65
Sugarcane bud moth .....	10, 59
Sugarcane butt weevil .....	56
Sugarcane froghopper .....	12, 69
Sugarcane leaf beetle .....	55
Sugarcane looper .....	75
Sugarcane planthopper .....	19, 67, 68
Sugarcane scale .....	14, 71, 74
Sugarcane soldier fly .....	48
Sugarcane weevil borer .....	11, 61
Sugarcane whitefly .....	75
Sugarcane wireworm .....	53
Swamphen .....	79
Symphyla .....	9, 52

## T

<i>Teleogryllus commodus</i> .....	60
<i>Teleogryllus oceanicus</i> .....	60
Termites .....	11, 62



# Index

---

<i>Tetraneura nigriabdominalis</i> .....	72
Thrips .....	76
Top borer .....	80

## W

Wallaby .....	79
Wart-eye mite .....	75
Weevil borer .....	11, 18, 56, 58, 61
Weevils .....	10
White ants .....	62
White ground pearl .....	49
Whitefly .....	75
Whitefringed weevil .....	57
Wireworms .....	9, 53, 55, 58
Woolly aphid .....	80

## Y

Yellow soldier fly .....	48
Yellow sugarcane cicada .....	50
Yellow-winged locust .....	63

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The *Pests of Australian Sugarcane Field Guide* contains simply presented information and photos covering the sugarcane pests in Australia. All Australian pests of importance are included, along with examples of exotic pests in Papua New Guinea and biological control agents of native species.

The guide is designed for researchers, extension and quarantine staff, as well as farmers, harvester operators, consultants, private contractors and agribusiness personnel.



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