SOUTH AFRICAN SUGARCANE RESEARCH INSTITUTE

# Pest & Disease Guide

## DISEASES


- Ratoon stunt (RSD) 4
- Smut 6
- Mosaic 8
- Yellow leaf/Leaf yellows 10
- Maize streak 12
- Fiji leaf gall 14
- Pokkah boeng 16
- Leaf scald 18
- Gumming 20
- Red stripe/Top rot/False red stripe 22
- Sour rot 24
- Red rot 26
- Pineapple sett rot 28
- Basal stem rot 30
- Brown rust 32
- Tawny rust 34
- Orange rust 36
- Brown spot 38
- Ring spot 40
- Yellow spot 42
- Red leaf spot 44
- Eye spot 46

## PESTS


| | | |
|---|---|---|
| ! | Eldana | 48 |
| | Sesamia | 50 |
| ! | Chilo | 52 |
| | Sugarcane thrips | 54 |
| | White grubs | 56 |
| ! | Locusts | 58 |
| | Trash caterpillars | 60 |
| | Army worms | 62 |
| | Leaf folder moths | 64 |
| | Aphids | 66 |
| | Mites | 68 |
| | Termites | 70 |
| | Nematodes | 72 |
| ! | Longhorn Beetle | 74 |
| ! | Yellow sugarcane aphid | 76 |
| ! | Fall armyworm | 78 |


! *Remedial action may be required (Sugar Act, 1978). Contact your Extension Specialist, your local Biosecurity Officer or the SASRI biosecurity hotline (083 561 2781)*

# Ratoon stunt (RSD)

## *Causal organism*

- Bacterium: *Leifsonia xyli* subsp *xyli*

## *Symptoms*

- No obvious external symptoms
- Diseased stools become stunted, field may have an uneven appearance
- Some varieties may have red-brown dots and streaks at the base of nodes in sliced stalks

## *Notes on the disease*

- Samples from field suspected to be infected should be sent to SASRI for diagnosis


5

# Smut

## *Causal organism*

- Fungus: *Sporisorium scitamineum*

## *Symptoms*

- Thin, elongated stalks develop before whip emergence (incipient whips)
- Dark brown, whip-like structures emerge from the top of infected stalks and sideshoots
- Severely infected stools degenerate into clumps of grasslike, unmillable shoots

## *Notes on the disease*

- Occurs throughout the industry but most common and severe in the northern region
- Warm, dry winters favour outbreaks in spring

# Mosaic

## *Causal organism*

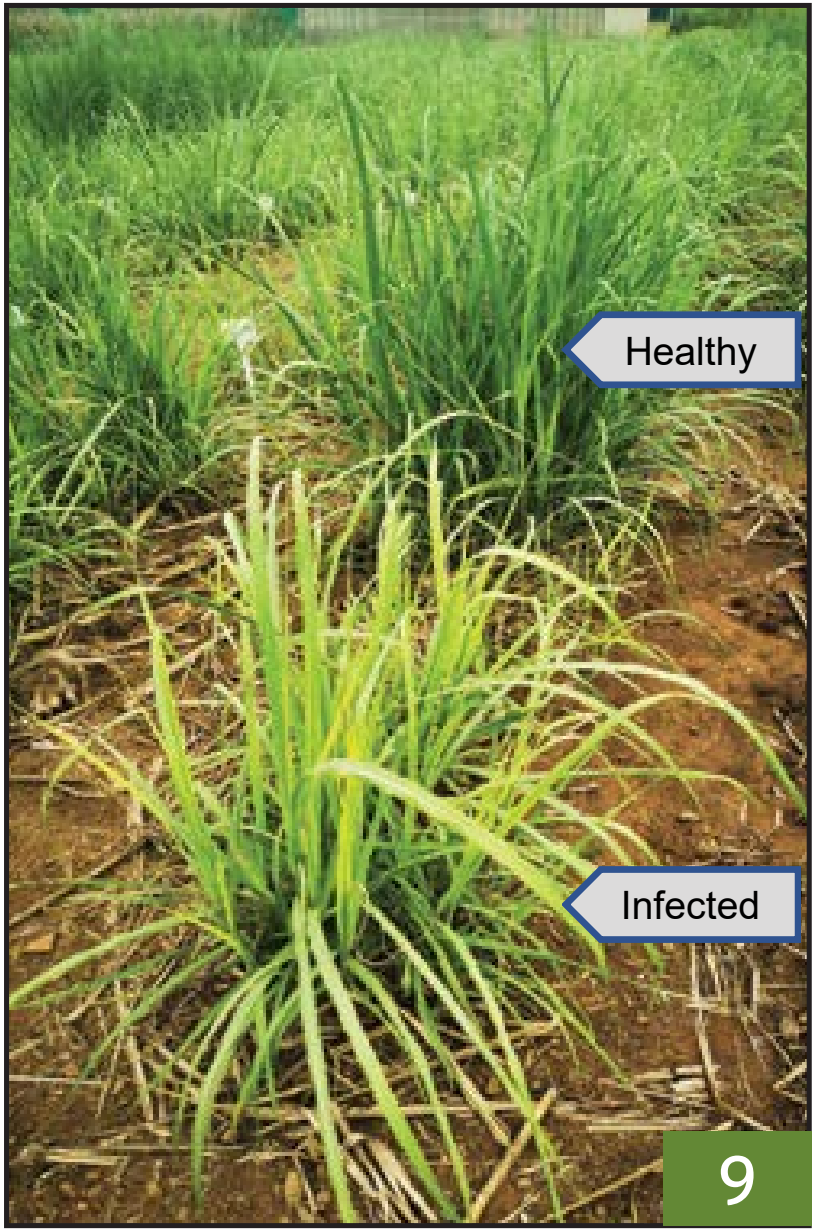
- Virus: *Sugarcane mosaic virus*

## *Symptoms*

- Mottled leaves (usually dark green islands on a pale green background)
- Infected stools may have a yellow-green appearance

## *Notes on the disease*

- Symptoms most obvious at the base of young leaves


Healthy
Infected

# Yellow leaf/Leaf yellows

## *Causal organism*

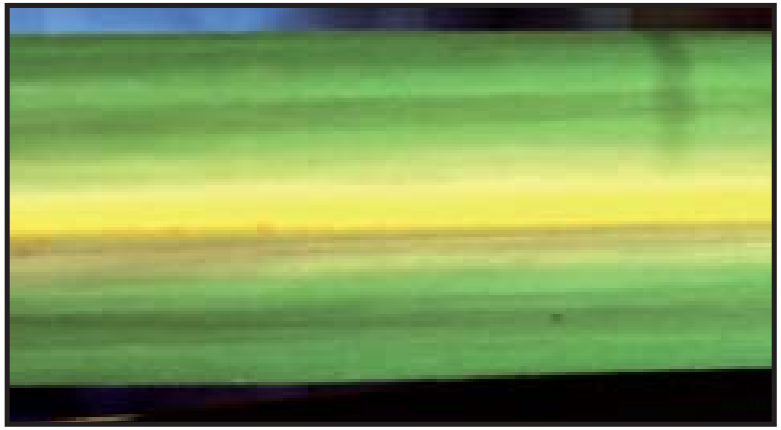
- Virus: *Sugarcane yellow leaf virus*
- Phytoplasma: *Sugarcane leaf yellows phytoplasma*

## *Symptoms*

- Yellow to yellow-red discolouration of the midrib
- Yellowing may extend into the leaf blade
- Yellowing most obvious on the third to sixth leaf

## *Notes on the disease*

- Symptoms usually expressed in maturing, stressed cane
- Symptoms seldom expressed under good growing conditions, cane appears healthy



# Maize streak (MSV)

## *Causal organism*

- Virus: *Maize streak virus*

## *Symptoms*

- Elongated, spindle-shaped, chlorotic (white) lesions
- Lesions are 1-20mm long x 1-2mm wide but may join to form longer and thicker stripes on the leaf blade
- Lesions visible on both upper and lower leaf surfaces
- Lesions may be visible on the leaf sheath

## *Notes on the disease*

- Notify SASRI Biosecurity if found

# Fiji leaf gall

## *Causal organism*

- Virus: *Fiji disease virus*

## *Symptoms*

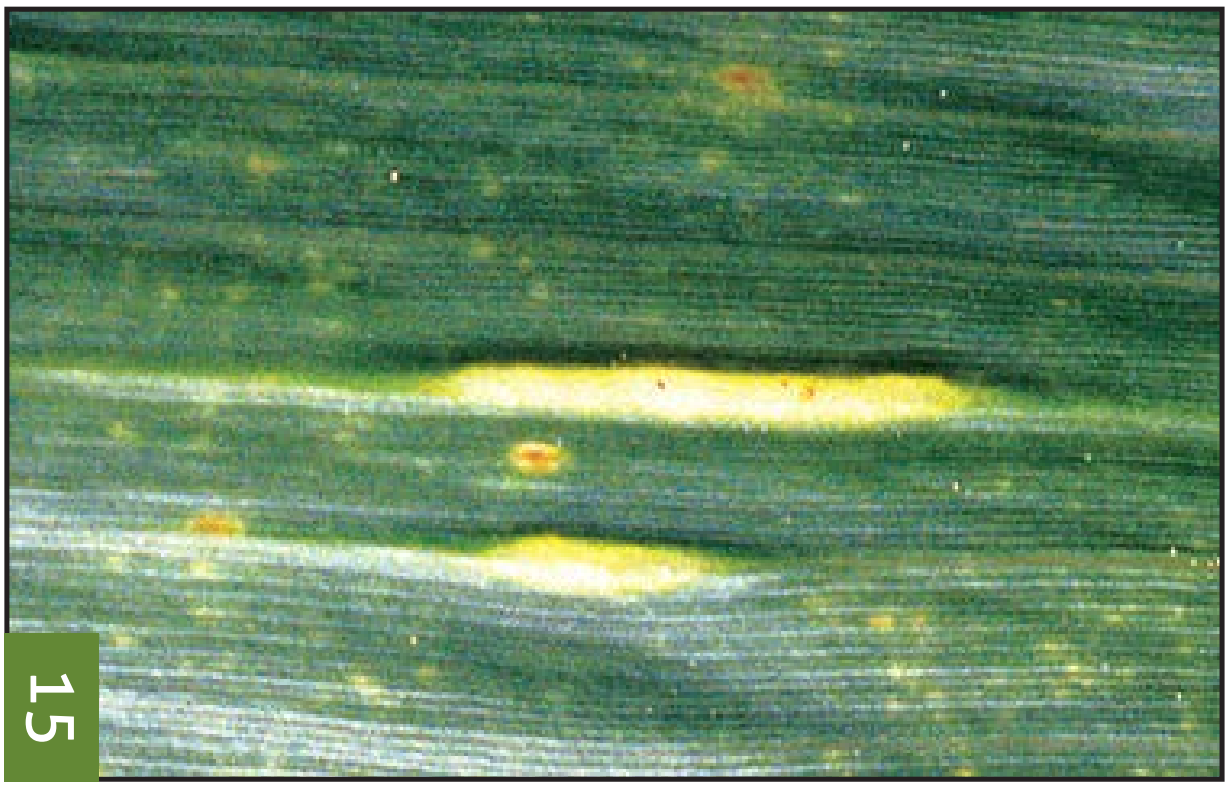
- White to cream coloured galls on the lower leaf surface, 2-50 mm long
- Distorted tops
- New leaves shortened and erect
- Stunting

## *Notes on the disease*

- Apart from the presence of leaf galls, symptoms may be similar to pokkah boeng
- Notify SASRI Biosecurity if found

**Not present in South Africa**

Photo: Dr R Magarey (SRA, Australia)



15

Photo: Dr R Magarey (SRA, Australia)

# Pokkah boeng

## *Causal organism*

- Fungus: Various *Fusarium* sp.

## *Symptoms*

- Mild chlorosis / bleaching at the base of young leaves
- Wrinkled, twisted and shortened young leaves
- Distorted, sometimes blackened spindle
- Side-shooting, stalk death due to death of growing point
- Ladder-like lessions on the rind
- 'Knife cuts' on stalks may result in stalk damage

## *Notes on the disease*

- Favoured by hot, wet conditions when cane growth is likely to be rapid
- May be confused with herbicide damage

# Leaf scald

## *Causal organism*

- Bacterium: *Xanthomonas albilineans*

## *Symptoms*

- Narrow, sharply defined white pencil lines on young leaves
- Leaf chlorosis (whitening)
- Leaves appear withered (scalded) and curl inwards
- Basal sideshoots
- Sudden stool death may occur

## *Notes on the disease*

- More common in northern irrigated areas
- Notify SASRI Biosecurity if found

# Gumming

## *Causal organism*

- Bacterium: *Xanthomonas axonopodis* pv *vasculorum*

## *Symptoms*

- Straw coloured streaks from leaf margins
- Leaf chlorosis (whitening)

## *Notes on the disease*

- Most common in areas of high humidity

# Red stripe/Top rot/False red stripe

## *Causal organism*

- Bacteria: *Acidovorax avenae* subsp *avenae*, *Xanthomonas* sp

## *Symptoms*

- Red stripes on the leaf blade
- *Acidovorax* may cause rotting of the spindle and top of the stalk

## *Notes on the disease*

- Unpleasant odour may be associated with rotting
- Favoured by warm, moist weather

# Sour rot

## *Causal organism*

- Fungus: *Phaeocytostroma sacchari*

## *Symptoms*

- Orange-red rotting of internal stalk tissue
- Orange to black discolouration of the rind
- Rind may have rough appearance due to black fruiting structures / pustules
- Distinct sour odour

## *Notes on the disease*

- Common in mature, drought-stressed cane in the Mid-lands
- May result in substantial sucrose losses

# Red rot

## *Causal organism*

- Fungus: *Glomerella tucumanensis*

## *Symptoms*

- Elongated red lesions on the leaf midrib
- Internal reddening of the stalk tissue
- White patches may be observed within reddened tissue

## *Notes on the disease*

- Usually associated with borer damage and cracks
- More common in the Midlands

# Pineapple sett rot

## *Causal organism*

- Fungus: *Ceratocystis paradoxa*

## *Symptoms*

- Poor germination
- Internal red discolouration of infected setts, black in the centre
- Characteristic fruity odour

## *Notes on the disease*

- Common when growing conditions are poor and germination is slow
- Heat treated seedcane may become infected if germination is delayed
- Registered fungicides available

# Basal stem rot

## *Causal organism*

- Fungus: Basidiomycete

## *Symptoms*

- Stunted growth, poor tillering
- Reddish-brown rotting at the base of shoots
- White fungal growth around and between basal leaf sheaths

## *Notes on the disease*

- Most common in young cane in spring and early summer

# Brown rust

## *Causal organism*

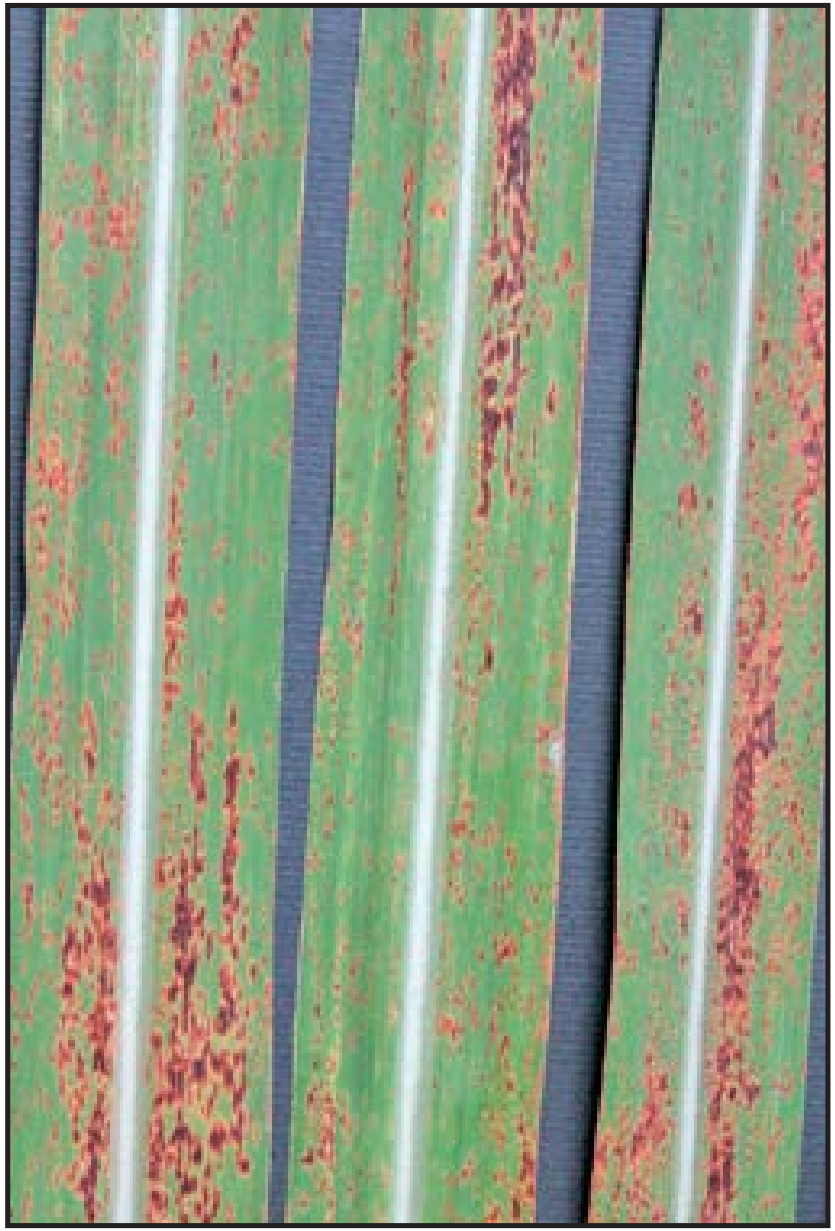
- Fungus: *Puccinia melanocephala*

## *Symptoms*

- Brown lesions, 2-20mm long x 1-3mm wide
- Brown spores usually on the lower leaf surface
- Affected fields have orange-brown colour
- Lesions often clustered near the leaf tip

## *Notes on the disease*

- Most common on young cane, 3-6 months
- Favoured by cool, moist conditions
- May cause serious yield loss when severe
- Registered fungicides available



# Tawny rust

## *Causal organism*

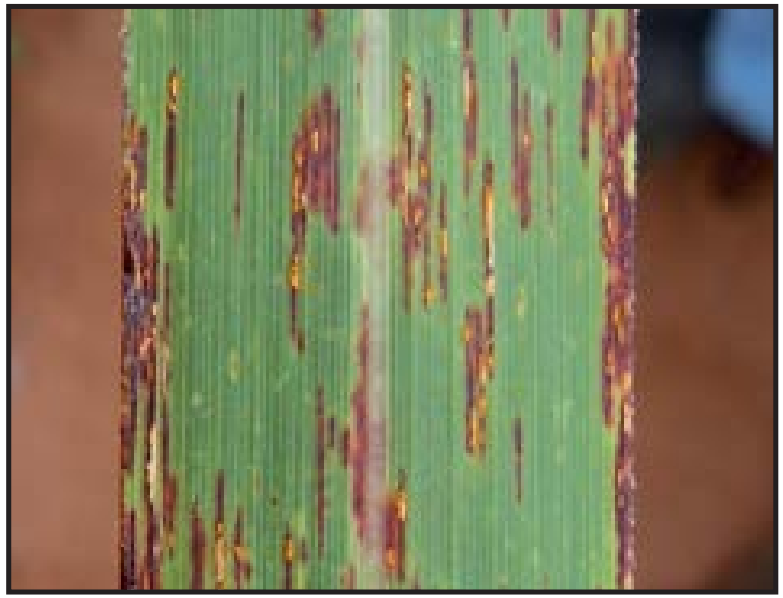
- Fungus: *Macruropyxis fulva*

## *Symptoms*

- Brown lesions, 2-20mm long x 1-3mm wide
- Orange spores on both lower and upper leaf surfaces
- Affected fields have orange-brown colour
- Lesions often clustered near the leaf tip

## *Notes on the disease*

- Observed on cane of any age
- Favoured by cool, moist conditions
- Can cause serious yield loss when severe
- Orange spores easily transferred onto clothes
- Registered fungicides available



# Orange rust

## *Causal organism*

- Fungus: *Puccinia kuehnii*

## *Symptoms*

- Orange to orange-brown lesions, 3-8mm long x 1-2mm wide
- Orange spores usually on lower leaf surface
- Affected fields have orange-brown colour
- Lesions often clustered towards the middle or base of the leaf

## *Notes on the disease*

- Most common on cane >6 months
- Favoured by warm, humid weather
- Can cause serious yield loss when severe
- Notify SASRI Biosecurity if found
- Registered fungicide available

**Has not been observed on sugarcane in SA**

Photo: Dr R Magarey (SRA, Australia)



Photo: Dr K Braithwaite (SRA, Australia)

Photo: S Sood, USDA-ARS, Florida

# Brown spot

## *Causal organism*

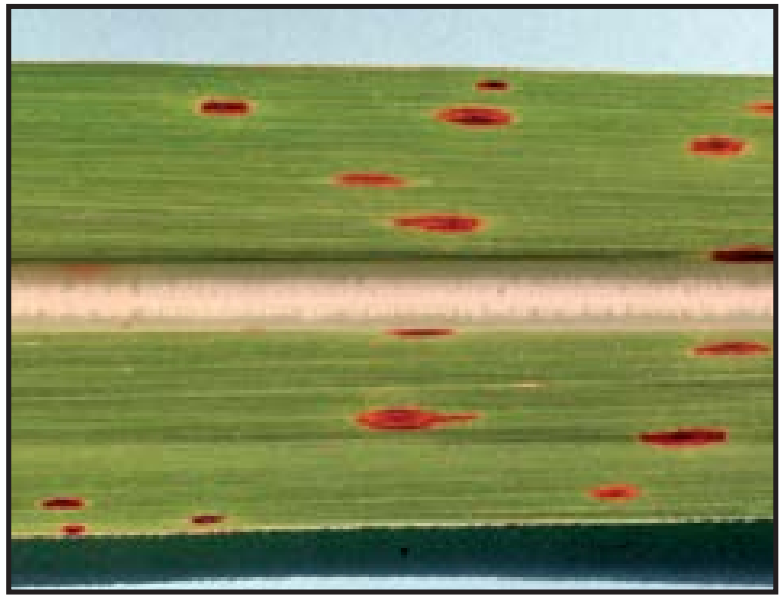
- Fungus: *Cercospora longipes*

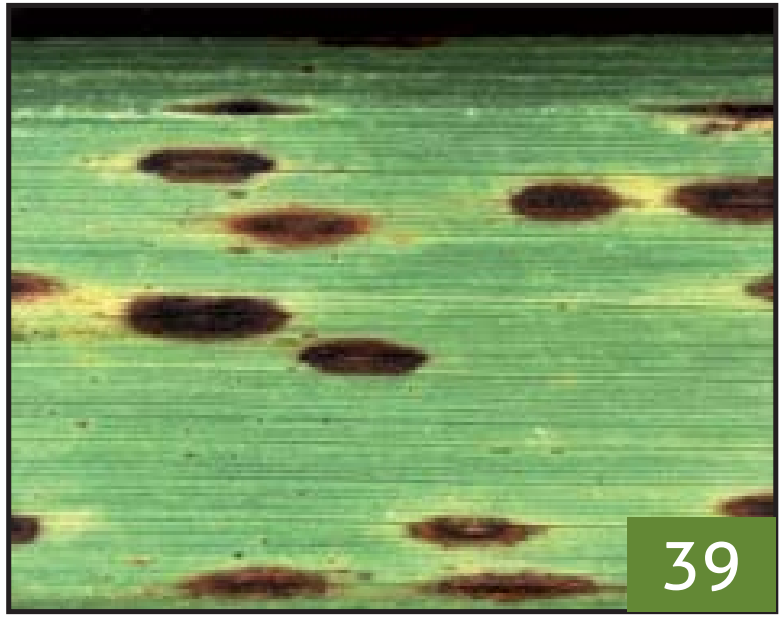
## *Symptoms*

- Reddish brown to dark brown lesions, up to 15mm long x 3mm wide
- Lesions are oval with a yellow halo, visible on both leaf surfaces

## *Notes on the disease*

- Most common in summer





# Ring spot

## *Causal organism*

- Fungus: *Leptosphaeria sacchari*

## *Symptoms*

- Irregular shaped lesions, 10mm or more in length
- Lesions straw-coloured to brown, usually with a dark brown margin
- Small black fruiting bodies usually visible within mature lesions
- Lesions visible on both leaf surfaces

## *Notes on the disease*

- Occurs throughout the year
- Usually visible on older leaves

# Yellow spot

## *Causal organism*

- Fungus: *Mycovellosiella koepkei*

## *Symptoms*

- Irregular shaped lesions up to 10mm in diameter
- Lesions initially yellow but later turn brick red
- Lesions visible on both leaf surfaces

## *Notes on the disease*

- Favoured by cool, moist conditions

Photo: S. Saumtally - MSIRI

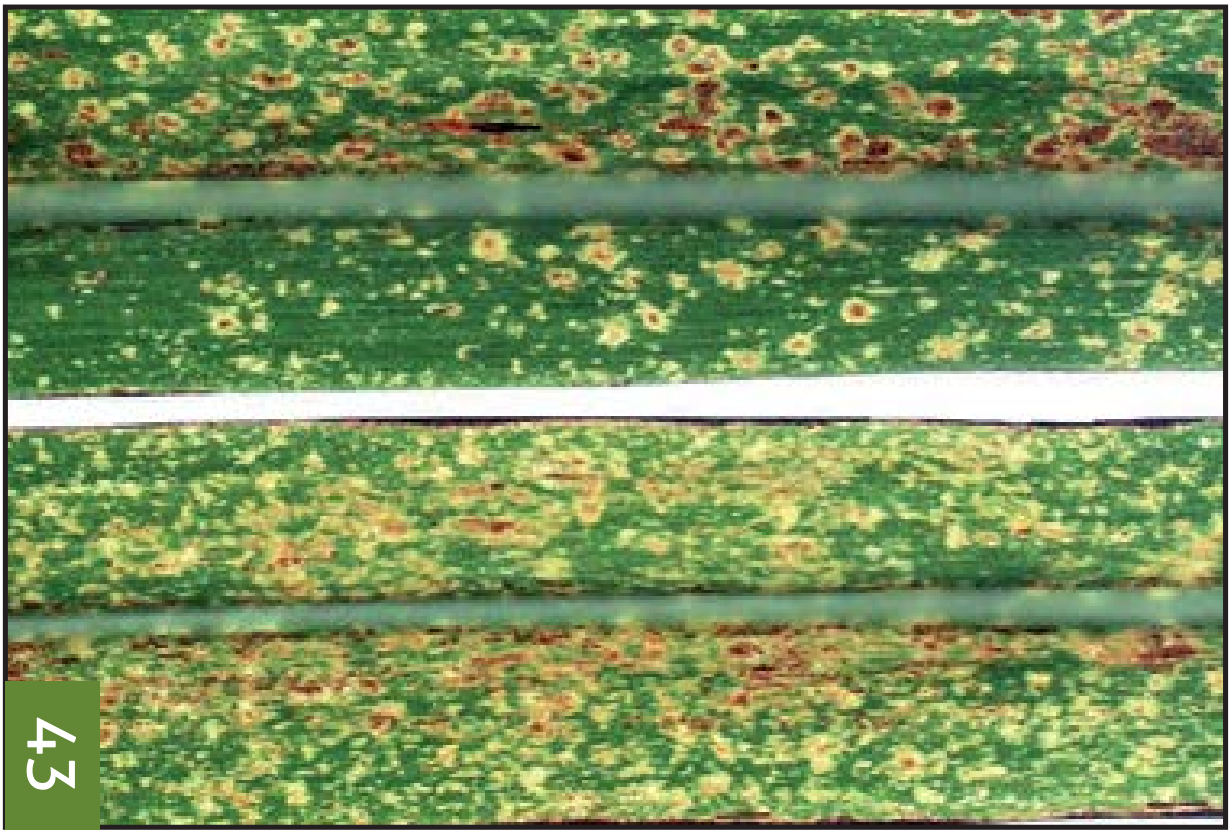




Photo: S. Saumtally - MSIRI

# Red leaf spot

## *Causal organism*

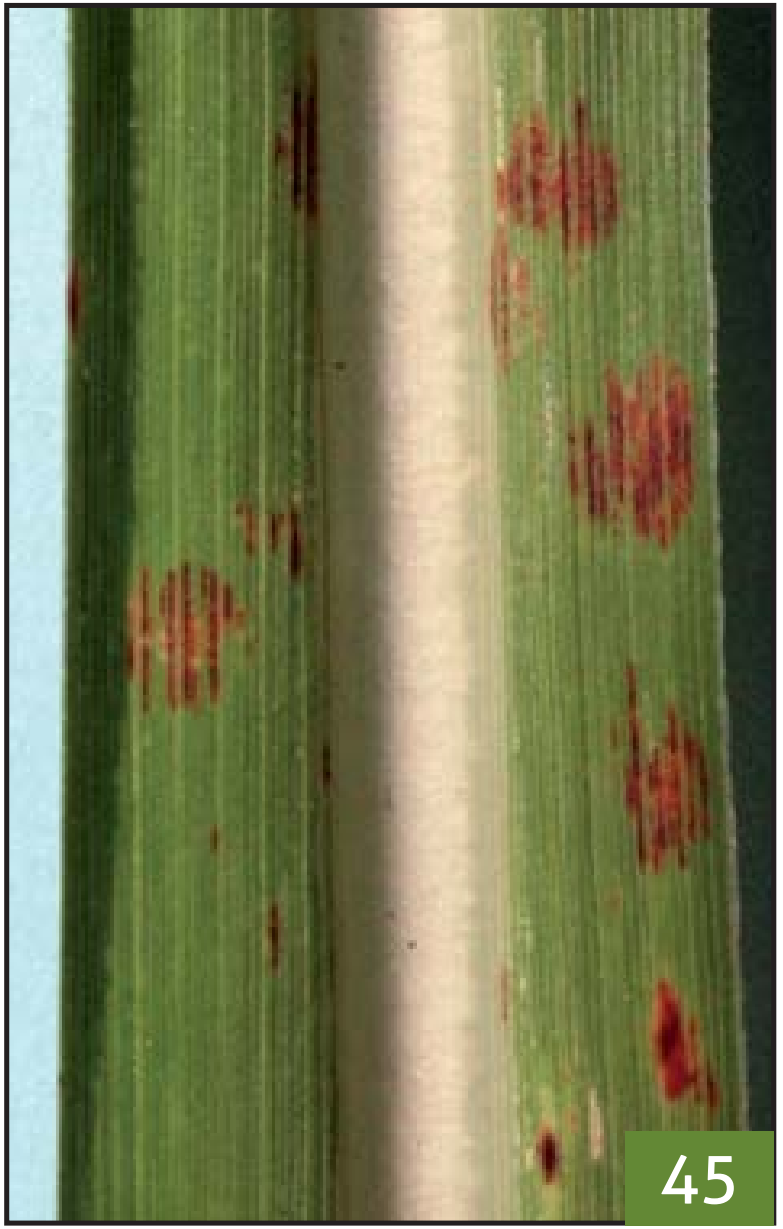
- Fungus: *Dimeriella sacchari*

## *Symptoms*

- Lesions round, up to 12mm in diameter
- Lesions usually only visible on the upper leaf surface and tend to cluster near the leaf tip
- Lesions more common on the older (5th and 6th) leaves

## *Notes on the disease*

- Favoured by warm, humid weather



# Eye spot

## *Causal organism*

- Fungus: *Bipolaris sacchari*

## *Symptoms*

- Lesions are oval, 1-6mm long x 1-3mm wide
- Mature lesions are reddish-brown with yellow-brown margins
- Reddish-brown runners extend from the lesion towards the leaf tip

## *Notes on the disease*

- Favoured by cool, wet weather

# Eldana

*Eldana saccharina* (Lepidoptera: Pyralidae)

## *Identification*

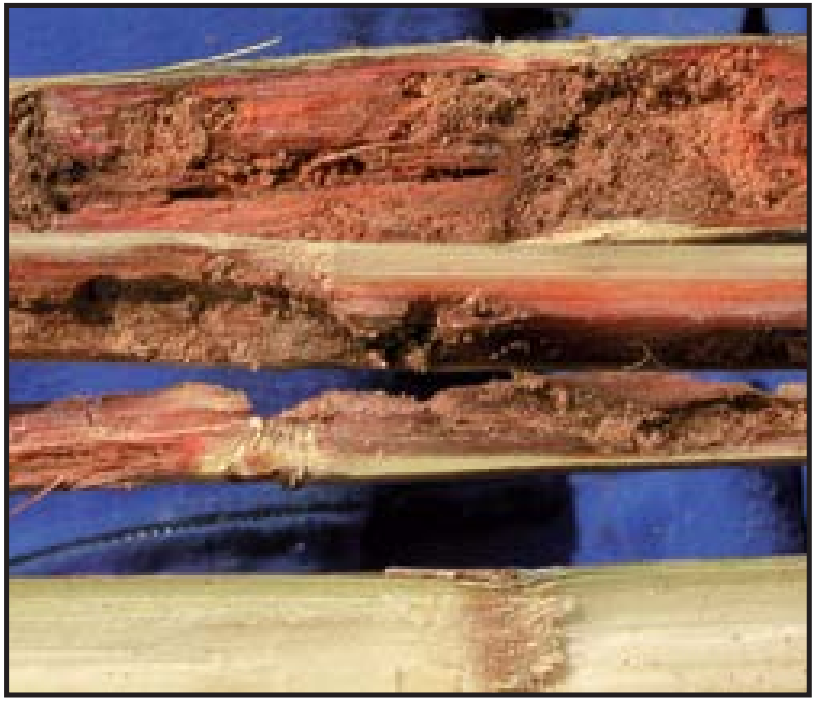
- Active, brown, leathery larva
- Move backwards and forwards

## *Symptoms*

- Insect frass (faeces) indicates presence in stalk, usually in lower third
- Borings observed when stalks split open
- Tissue around borings usually red

## *Comments*

- Major pest causing economic loss over a large area
- If detected, action may be required
- Enters stalk through nodal buds



# Sesamia

*Sesamia calamistis* (Lepidoptera: Noctuidae)

## *Identification*

- Pink larva, less active than eldana
- Does not move backwards

## *Symptoms*

- Causes 'dead-hearts' in young cane
- Spindle pulls out easily, may have foul odour
- Exit holes observed near top of tiller

## *Comments*

- Minor pest controlled by natural enemies
- May be confused with white coloured *Busseola*

# Chilo

*Chilo sacchariphagus* (Lepidoptera: Crambidae)

## *Identification*

- Striped larva

## *Symptoms*

- Shot-holes through the leaves
- Side-shooting on stalk
- Red borings, usually towards top of stalk

## *Comments*

- Major sugarcane pest in Mozambique
- Poses a major biosecurity risk to RSA sugar industry
- Looks the same as maize borer (*C. partellus*), distinguished using DNA analysis

**Not present in South Africa**

# Sugarcane thrips

*Fulmekiola serrata* (Thysanoptera: Thripidae)

## *Identification*

- Adult: dark brown to black, 1mm long
- Nymphs colourless to yellow with red eyes

## *Symptoms*

- Leaf tips tied together, become dry and twisted later
- Yellow to white patches on open leaves
- Leaf margins may die and turn brown

## *Comments*

- Found by unrolling spindle leaves

# White grubs

Various species (Coleoptera: Scarabaeidae)

## *Identification*

- Larvae: brown head capsule, soft C-shaped body with whitish/grey-white, fleshly abdomen
- Beetles hard shelled, reddish brown to black, 19 to 25 mm long

## *Symptoms*

- Cane may turn yellow, stunted and patchy, may yield and ratoon poorly
- Root pruning may be observed, some adults *(Heteronychus licas)* damage the base of stalks resulting in dead hearts

## *Comments*

- Found by digging underneath stools

# Locusts

Various species (Orthoptera: Acrididae)

## *Identification*

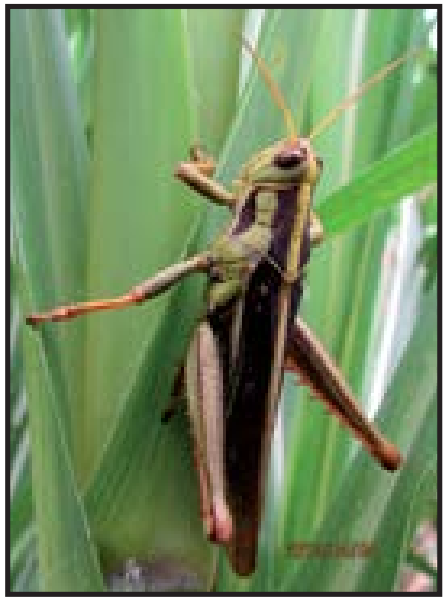
- Typical insect with enlarged hind legs

## *Symptoms*

- Feeds on leaf margins

## *Comments*

- Infestations usually occur during summer
- Outbreaks triggered by dry periods before good rains in summer



# Trash caterpillars

Various species (Lepidoptera: Noctuidae)

## *Identification*

- Caterpillars striped, with light and dark shades of brown-grey

## *Symptoms*

- Young cane may be completely defoliated
- Frass observed at the base of plants

## *Comments*

- Attack leaves of young ratoons from April to November
- Larvae feed at night and shelter under the trash blanket during the day
- Controlled by natural enemies

# Army worms

*Spodoptera exempta* (Lepidoptera: Noctuidae)

## *Identification*

- Larvae green and black with a green underside and longitudinal white stripes

## *Symptoms*

- Young cane may be completely defoliated

## *Comments*

- Caterpillars move in large groups
- Outbreaks may occur in late summer, cane usually recovers
- Controlled by natural enemies

# Leaf folder moths

*Marasmia trapezalis* (Lepidoptera: Crambidae)

## *Identification*

- Greenish-yellow larva with brown head capsule

## *Symptoms*

- Leaf blades folded
- Single larva inside rolled leaf with insect frass and silk strands
- Transparent striping on open leaf, which may turn red

## *Comments*

- Controlled by parasitoids

# Aphids

Various species (*Hemiptera*: Aphididae)

## *Identification*

- Soft-bodied insects
- Often found on the lower surface of the leaf

## *Symptoms*

- Leaves may develop red flecks after feeding, similar to mite damage
- Sooty mould may develop on aphid honey-dew

## *Comments*

- Some species spread plant diseases
- See pages 76-77 for information on yellow sugarcane aphid

# Mites

Various species (Acarina)

## *Identification*

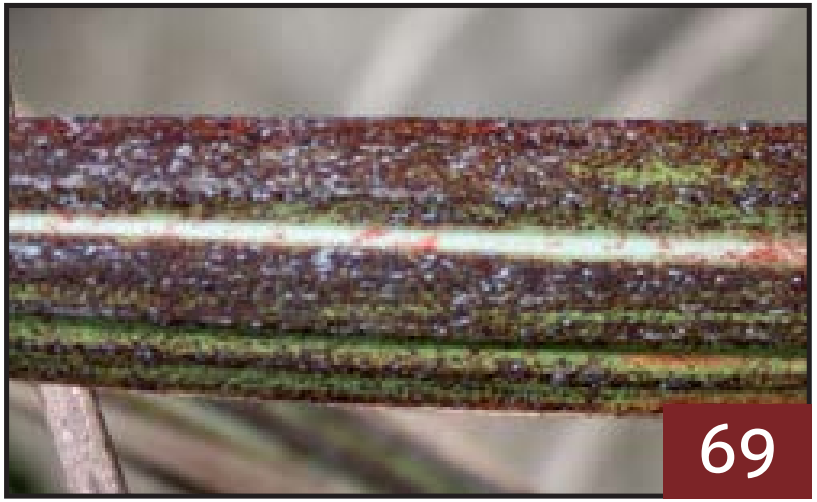
- Microscopic
- Fine webs on lower surface of leaves

## *Symptoms*

- Fine red freckling on leaves
- Fields may have general red-brown appearance, similar to rust

## *Comments*

- Most common during dry periods



# Termites

*Macrotermes natalensis* (Blattodea)

## *Identification*

- Soft bodied, cream coloured, resembling ants

## *Symptoms*

- During foraging, may attack cane at soil level
- Tunnelling may be observed towards the base of stalks
- May cause stalks to collapse

## *Comments*

- Inhabit subterranean nests
- Damage to cane often associated with drought

# Nematodes

*Meloidogyne, Xiphinema, Pratylenchus, Paratrichodorus*

## *Identification*

- Microscopic, worm like organisms. Soil and root sample required for identification
- Cannot be seen with the naked eye

## *Symptoms*

- Crops show stunted, uneven growth and 'spikey' leaves
- Roots sparse, short and stubby with a reduced presence of fine root hairs

## *Comments*

- Damage tends to be most severe on sandy soils
- The presence of damaging nematodes can only be identified by taking soil and root samples and sending to a reputable lab for identification
- Managed with nematicides and by focusing on keeping the plant healthy

# Longhorn Beetle

*Cacosceles newmannii* (Coleoptera: Cerambycidae)

## *Identification*

- Larvae yellowish to creamy white, up to 9 cm long. Dark brown head capsule with distinct mandibles
- Pupae soft bodied, encased in soil cocoon below stool
- Adult: tan to dark brown, males ~47 mm with large mandibles, females ~35 mm

## *Symptoms*

- Large bored tunnels in stool below ground and ~20 cm into above-ground stalk
- Stunted, lodged stalks easily pulled from ground, brown leaves and dead hearts

## *Control measures*

- Plough out cane crop immediately after detection followed by at least one year fallow period

**Major indigenous pest currently localised in Entumeni area.**

# Yellow sugarcane aphid (YSA)

*Sipha flava* (Hemiptera:Aphididae)

## *Identification*

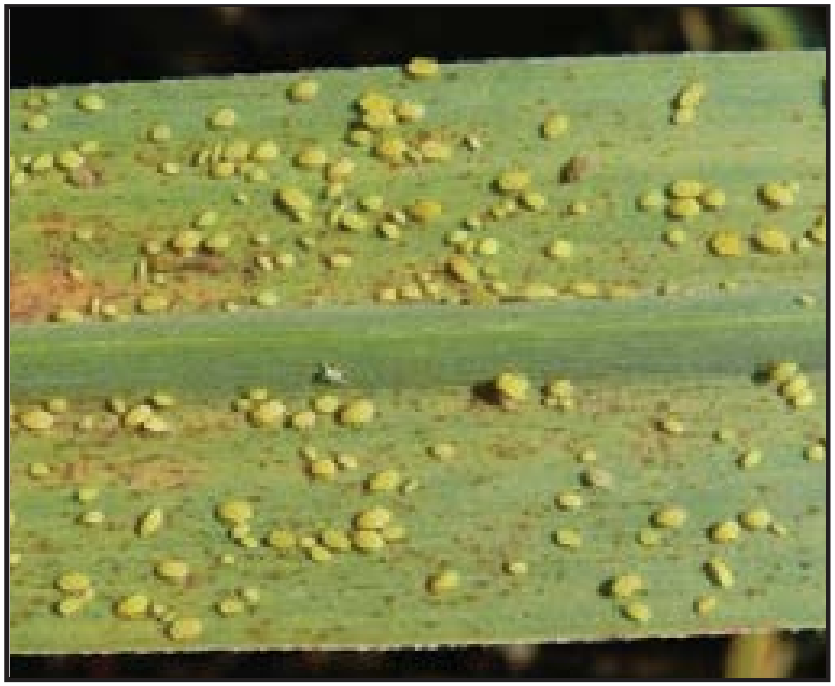
- Nymphs and adults: yellow, often straw coloured
- Adults: 1-2 mm ,usually wingless but winged females may occur
- Nymphs: wingless and smaller than adults

## *Symptoms*

- Feed on underside of leaf, causing leaf yellowing/reddening, with brownish-red puncture marks
- Prolonged feeding causes death of mostly third to fifth green leaves below stalk growing point leading to ~20% yield loss
- Young plants <1 m high most susceptible, but older plants can be severely infested

## *Comments*

- Scout field before spraying (registered) insecticide
- Registered insecticides are available for YSA, but growers should scout fields and consult Extension for advice on preventative and reactive measures
- Commercial varieties differ in resistance (leaf damage)



# Fall armyworm

*Spodoptera frugiperda* (Lepidoptera: Noctuidae)

## *Identification*

- Larva: Light green to almost black with stripes. Head capsule has a light-coloured inverted "Y"

## *Symptoms*

- Larva feeds on youngest (spindle) leaves at top of plant, resulting in 'shot hole' damage to these leaves when they unfurl
- Does not bore into growing point

## *Comments*

- Found on sugarcane in South Africa but extent of damage is unconfirmed
- Insecticides have provisionally been registered on sugarcane in South Africa to control any outbreaks and prevent spread

*Published by*

*South African Sugarcane Research Institute*
*170 Flanders Drive, Mount Edgecombe, 4300*
*Tel: (031) 508 7400 Fax (031) 508 7597*
*SASRI biosecurity hotline : 083 561 2781*
*Website: www.sasri.org.za*

*ISBN: 1-874903-39-5*

*Updated 2022*