New Confidor® Guard keeps grubs out of cane.
Confidor® Guard

Confidor Guard is a liquid flowable (suspension concentrate) insecticide that contains 350 g/L of imidacloprid — the unique active ingredient. Imidacloprid belongs to a new class of insecticides called the chloronicotinyls.

Cost effectiveness
- In trials conducted in the last two years Confidor Guard treated cane generally provided at least a 20% increase in yield compared to untreated cane that was damaged by greyback canegrubs.
- For crops yielding around 85 tons/ha (at 7 US c/b for sugar) this would give an increased income after harvesting costs of about $279/ha.
- For crops yielding around 116 tons/ha a 20% yield increase would give additional income of around $485/ha.
- If the crop is damaged badly enough it will have to be replanted and this can cost $1000–$1500/ha.
- Protection with Confidor Guard at 1.05 L/ha to 1.44 L/ha costs considerably less than the potential increased return and may save having to replant.

Unique mode of action
Confidor Guard works very differently from older insecticides such as the organophosphates (OPs).

Flexible placement
A plant systemic insecticide can be taken up by the roots of plants, and travel within the plant with the sap flow. OP canegrub insecticides are not plant systemic: they are only effective if canegrubs came into direct contact with the chemical in the soil. Accurate placement of OPs in relation to the root system is therefore essential for good results.

‘Anti-feeding’ effect
Cane grubs larvae that receive a dose of Confidor Guard immediately reduce their feed intake and will often stop feeding altogether.

In contrast, Confidor Guard is a systemic insecticide. This allows excellent flexibility in its placement:
- Confidor Guard can act against canegrubs by direct contact in the soil – just like OPs.
- Confidor Guard can be ingested (eaten) by the pest – eg when canegrubs attack roots of cane that have been treated with Confidor Guard; or when grubs consume some soil as they feed in the root mass. Ingestion provides greater activity against insects than direct contact.
- To a limited extent, Confidor Guard can also move within the soil – mainly with the wetting front, as soil moisture changes in the soil. This water movement can be used to ensure that the active ingredient moves into the cane stool area.

Flexible timing
Confidor Guard acts at very low rates of active ingredient, and does not appear to break down at rapid or enhanced rates. As a result, application can be timed to deliver an extended period of control. For example, research has measured very good efficacy against several species of grubs in March/April, from applications made during September/October in the previous year.

Confinder Guard tends to work better with earlier rather than later applications – because the action against smaller stages of canegrubs (eg 2nd instar larvae, or small 3rd instars) is stronger than against large mature grubs.

Figure 1: Efficacy of Confidor Guard against greyback grubs at a heavily infested site at Little Mulgrave in Far North Queensland. This trial clearly showed that in situations where numbers of grubs are high, higher rates were needed to obtain good levels of control.

Figure 2: Yield responses with Confidor Guard against greyback grubs at the same site at Little Mulgrave in Far North Queensland. Higher rates gave significantly higher yield responses at this heavily infested site. Confidor Guard at 1.44 L/ha gave a yield benefit of about 30 tonnes cane per hectare.

Figure 3: Childers canegrub control with Confidor at 54-55 DAT. Childers, Qld. 2000/2001

Figure 4 the same trial, shows that cane yields were significantly higher in plots treated with Confidor compared to the untreated control. There was no significant difference between Confidor and Rugby, although the yields trended higher with the higher label application rate of Confidor.
Canegrub pests

In Australia, ‘canegrubs’ refers to the larvae of about 20 native species of beetle that have been shown to damage sugar cane plants by feeding on their roots. Canegrubs are the most damaging insect pests of sugar cane in Australia.

Lifecycle characteristics
- Some canegrub species have a two-year lifecycle, which includes an ‘over-wintering’ phase – when grubs move deep in the soil profile during colder months and come up again to feed on cane roots in early spring. Other canegrub species have a one-year lifecycle and no overwintering phase.
- Larvae from all species go into a pupal stage before emerging as adult beetles, which fly in spring and summer each season.
- After feeding and mating, adult beetles lay eggs in cane fields.
- A few weeks later these eggs hatch into small grubs (1st instar larvae) that feed on organic matter in the soil. After molting into the medium-sized (2nd instar) and larger (3rd instar) larvae, the grubs start causing damage to cane root systems.

Patterns of damage
- In general, the severity of damage correlates strongly with numbers of actively feeding grubs. When there are high numbers of active grubs, much or all of the root systems will be destroyed.

Identification is crucial
The management of different canegrub species varies considerably. However, many canegrub species look similar, and are often found in the same localities. It is therefore important to know how and when to check for the presence of canegrubs, and how to identify the different species by examining the unique hair patterns (raster patterns) at the rear of their bodies.

Patterns of damage
- Damage from two-year lifecycle species tends to appear in early spring, while the effects from one-year species are often not apparent until late summer to autumn.

Monitoring grub damage and number to determine treatment required
It is important that growers monitor the number and species of grubs that are damaging their crop, because:
- Recommendations given for treatment with Confidor Guard relate to certain species only.
- The treatment rate is based on the number of canegrubs estimated to be present (or expected to be present) in each section of cane.

Canegrub numbers are usually measured as grubs per stool of cane. The grower can calculate the approximate average grub numbers in an area of cane by:
- selecting 10 stools spaced throughout the area
- checking the size (growth stage) of each grub found.

Using Confidor® Guard to control greyback canegrub (Dermolepida albohirtum)

Assessment
Greyback canegrubs mostly lay eggs from November until January. By the time the first grubs can be found in January, most cane will be too large to treat. Waiting until grubs are present before applying the insecticide is thus not feasible. In ratoon cane, in most cases it is necessary to apply the insecticide either before or soon after the adults fly.

The recommended approach is to assess the risk of infestation across the farm prior to treatment. This helps identify which areas are highly likely to be attacked and need selective treatment. Typical high-risk areas for greyback canegrubs are:
- blocks that have had a history of damage and/or
- blocks that appear tallest and most attractive to flying adults – eg early cut sections.

In some regions, harvest sequence and selective application of Confidor may become valuable techniques within an integrated system of greyback canegrub management. We recommend evaluating the relative risks to each field across the whole farm.

Application instructions
Rate: 16 – 22 mL per 100 metres of cane row (equivalent to 1.05 – 1.44 L/ha for single row cane with 1.52 m spacing between rows). The high rate is used when high grub populations are expected (eg an average greater than 4 grubs per stool).

• digging them out to a depth of 40 cm, leaving a hole 40 cm square
• inspecting the excavated soil and roots and identifying and counting the canegrubs found in this process
• averaging the number over the 10 stools

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Assessment

The Childers cane grub has a 2-year lifecycle. The first signs of damage are usually due to 3rd instar larvae from the previous season, which have overwintered at depth and moved back up in the soil profile in early spring to resume feeding on the cane roots. Growers can check blocks for these grubs by digging stools from spring onwards (early September). This will indicate exactly when and where to use Confidor Guard as a tactical ‘knockdown’ insecticide.

Early detection of grubs is critical. Wherever grub numbers exceed a recommended economic threshold (average of 3 grubs per stool), Confidor Guard should be applied as soon as possible. Research has shown that applying Confidor Guard early rather than late may create advantages in yield.

Application instructions

Rate: 11 or 16 mL per 100 metres of cane row (equivalent to 0.72 or 1.05 L/ha for single row cane with 1.52 m spacing between rows). Use the high rate when high grub populations are expected (eg an average greater than 5 grubs per stool) or if application is late (damage already visible).

Volume: Apply mixed in no less than 1.5 litres of water per 100 metres of cane row (equivalent to no less than 100 L/ha of water for single row cane with 1.52 m spacing between rows).

Timing: Check for the presence of grubs from September onwards. Apply Confidor when grub numbers reach an economic threshold (about 3 grubs per stool).

Soil moisture: Dry soil should receive at least 15 mm of rainfall or irrigation within 1 week of application.

Note: DO NOT leave Confidor exposed to sunlight. Ensure that after application the Confidor is covered by at least 100 mm of soil and that coulter slits are filled in.

Method: Twin coulters method ('side splitting'): Apply subsurface behind twin coulters spaced no more than 500 mm apart, immediately adjacent to each side of the stool.

Single coulters method ('stool splitting'): Apply subsurface behind a single coulter in the centre of the stool. Do not apply this method if ratoon growth is so advanced that the equipment may cause excessive crop damage.

Note: This method of application may only be effective in some areas. Consult your local Bayer CropScience representative before using this method.

Note: DO NOT leave Confidor Guard exposed to sunlight. Ensure that after application it is covered by at least 100 mm of soil and that coulter slits are filled in.

Method: Twin coulters method ('side splitting'): Apply subsurface behind twin coulters spaced 220–350 mm apart, one either side of the centre of the stool.

Single coulters method ('stool splitting'): Apply subsurface behind a single coulter in the centre of the stool. Do not apply this method if ratoon growth is so advanced that the equipment may cause excessive crop damage.

Note: This method of application may only be effective in some areas. Consult your local Bayer CropScience representative before using this method.

Not more than 500 mm

Two row side dressing applicator (in this machine coulters are joined because of the difficulty in penetrating a red volcanic soil)
The facts behind advanced cane grub management with Confidor® Guard

<table>
<thead>
<tr>
<th>Advanced features</th>
<th>Advanced benefits</th>
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<tbody>
<tr>
<td>Subsurface application</td>
<td>No loss through surface runoff.</td>
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<tr>
<td>No residues in the cane stalk</td>
<td>No sugar export issues.</td>
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<td>New chemical group</td>
<td>Reduces dependence on old chemistry.</td>
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<tr>
<td>Modern chemistry</td>
<td>Rigorously tested for efficacy, residues, environmental effects, toxicology and</td>
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<td></td>
<td>user safety.</td>
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<tr>
<td>New mode of action</td>
<td>Controls pests that may be resistant to other insecticide groups.</td>
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<td>Low hazard</td>
<td>Very low risks to the user and the environment.</td>
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<td>Low toxicity to vertebrate animals</td>
<td>Safe to users, domestic animals and wildlife, when used as directed.</td>
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<tr>
<td>Low toxicity to invertebrates</td>
<td>No long-term damage to soil microorganisms or earthworm populations.</td>
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<tr>
<td>Systemic</td>
<td>Can act from within plant. Can give longer residual effects. More options with</td>
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<td></td>
<td>application methods.</td>
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<tr>
<td>Active at low rates</td>
<td>Long period of residual efficacy. Reduced risk of off-target effects. Less</td>
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<td>packaging. Easy storage.</td>
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<tr>
<td>Degrades naturally in agricultural</td>
<td>Does not accumulate in animal tissue or the environment.</td>
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<td>environment</td>
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<tr>
<td>Efficacy unaffected by high soil pH</td>
<td>Good residual efficacy in all soils. Effective in soils that aggressively degrade</td>
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<td>other soil insecticides.</td>
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<tr>
<td>Moves slightly with soil moisture</td>
<td>Redistributes into the cane stool with rainfall and irrigation. More flexible</td>
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<td></td>
<td>application placement options.</td>
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<tr>
<td>Long residual efficacy</td>
<td>More flexible options with application timing – e.g. can apply in early spring at</td>
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<td>egg lay stage to control 3rd instar larvae in late autumn.</td>
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<tr>
<td>Repellency effect to cane grub larvae</td>
<td>Stops feeding of larvae. Can result in greater crop yield responses than would</td>
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<td>be expected from mortality effects on the pest.</td>
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<tr>
<td>Behavioural effects</td>
<td>Anti-feeding and motor activity disruption tends to allow survival for some time</td>
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<tr>
<td></td>
<td>before the pest dies – possibly allowing for the establishment of microbial</td>
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<td>pathogens against the insects.</td>
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<td>No odour</td>
<td>No unpleasant ‘chemical smell’ – less offensive to the non-farming community.</td>
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<tr>
<td>Liquid formulation</td>
<td>Easy to measure. Easy to mix. Simple calibration of application equipment.</td>
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<tr>
<td>Red dye</td>
<td>Identifies product for soil application only – makes it easier to see the level in</td>
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<td>the tank and in the soil.</td>
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<tr>
<td>Highly active, flexible and selective</td>
<td>Suitable for use in IPM and Integrated Crop Management systems (i.e. whole</td>
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<td>insecticide</td>
<td>farm planning).</td>
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<tr>
<td>Extremely low vapour pressure</td>
<td>Negligible loss through volatilisation. Needs only 100 mm soil cover for UV</td>
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<td>protection. More flexibility with placement and timing options.</td>
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The information and recommendations set out in this brochure are based on tests and data believed to be reliable at the time of publication. Results may vary as the use and application of the products is beyond our control and may be subject to climatic, geographical or biological variables, and/or developed resistance. Any product referred to in this brochure must be used strictly as directed and in accordance with all instructions appearing on the label for that product and in other applicable reference material. So far as it is lawfully able to do so, Bayer CropScience Pty Ltd accepts no liability or responsibility for loss or damage arising from failure to follow such directions and instructions.

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