

OPTIMUM APPLICATION OF IMIDACLOPRID FOR GREYBACK CANEGRUB MANAGEMENT



What affects cane grub populations?

Cane grub abundance and damage levels are affected by many factors including chemical insecticides, soil moisture, rainfall dry period, soil type and natural enemies. We can control our use of chemical insecticides but have little control over other factors.

Soil properties and climate: Soil moisture levels will be influenced by rainfall, dry period and soil properties.

- Heavy rainfall and waterlogged soils will reduce survival of eggs and early instars. Free draining soils are less likely to waterlog
- In dry periods eggs may desiccate more easily and fewer early instars will develop. However later instars are less affected by wet or dry soils as they are larger and more mobile and will move up or down the soil profile according to the moisture level to escape wet or dry conditions
- The number and timing of flights of adult canegrubs is also affected because soil moisture and temperature affect pupae emergence.

Life cycle of canegrubs

Greyback canegrub (*Dermolepida albobirtum*) has a one-year life cycle which is shown in Figure 1. Although the diagram shows a January-December timeframe the actual dates of each life-stage can vary depending on climate, cane-growing region and soil properties.

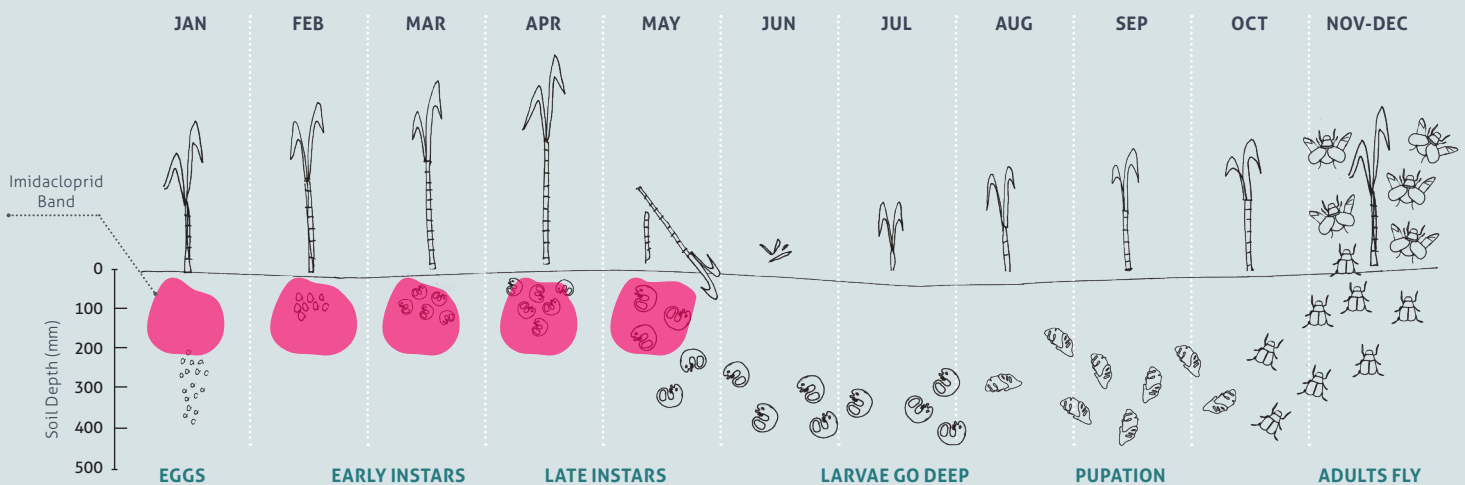
The important life-stages for chemical control are:

Eggs: Laid in batches of 20-30, at 22-45 cm depth. When the eggs hatch after a couple of weeks they develop into early (first) instars in January-February.

Early instars: First instars are small and feed on a mixture of soil organic matter, weeds and cane roots and gradually move up the soil profile. It takes about a month for them to develop into larger second instars.

Late instars: Second instars live for 5-6 weeks and cause more damage to cane roots than first instars. Third or late instar larvae, eat more cane roots and feed for several months causing significant damage. If not controlled effectively damage will result in stool tipping of mature cane in Autumn - Winter when more than two grubs are observed per stool.

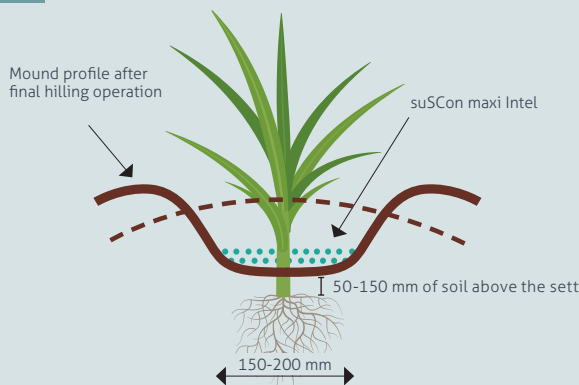
F.1 GREYBACK CANEGRUB LIFE CYCLE



OPTIMUM APPLICATION FOR GREYBACK CANEGRUB

suSCon MAXI INTEL

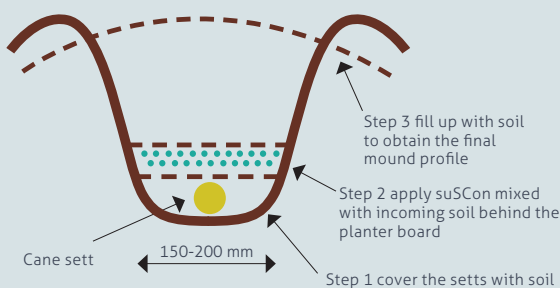
F.2A SUSCON MAXI INTEL BEST APPLIED AT HILL-IN OR HILL-UP



BEST APPLIED AT HILL-IN OR HILL-UP

- Sufficient soil between sett and application band
- Apply in a narrow band 150-200 mm
- Cover granules immediately with 50 mm of compacted soil or 100 mm of loose soil
- Granules should be covered by 150-200 mm of compacted soil once the row is finished and hilled up.

F.3A SUSCON MAXI INTEL AT PLANTING



APPLICATION AT PLANTING

When applying suSCon maxi Intel at planting, follow the three-step process described in F.3A

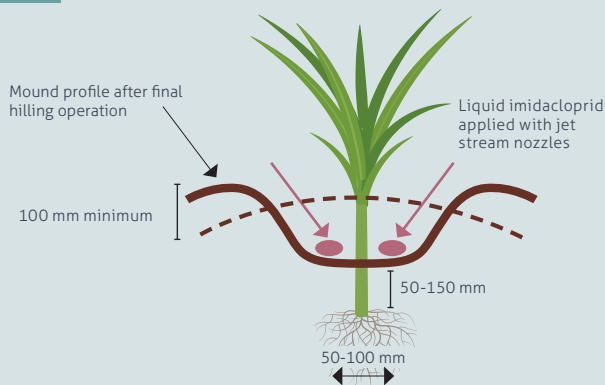
- Place suSCon in a 150-200 mm band
- Mix suSCon granules with incoming soil behind the planter boards to form a layer 20-30 mm deep and 150-200 mm wide across the row
- Most suitable when there is 200 mm or less soil above the sett in the finished hilled row.

For other planting methods, always ensure the product is applied in a narrow band and there is 50-150 mm soil between the sett and the application band

PLANT CANE

Liquid imidacloprid

F.4A LIQUID IMIDACLOPRID BEST APPLIED AT HILL-IN OR HILL-UP

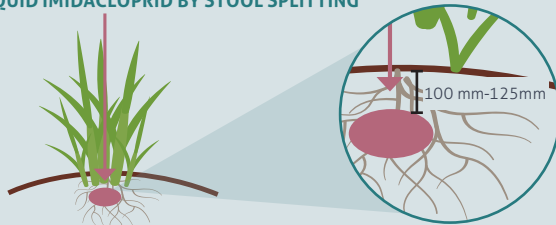


BEST APPLIED AT HILL-IN OR HILL-UP

- Sufficient active remaining when it is needed for grub control
- Sufficient soil between sett and application band
- Apply in a narrow band 50-100 mm* wide OR using one or two jet stream nozzles directed at the centre of the planting row
- Cover product immediately after application with at least 50 mm of soil. There should be at least 100 mm of soil over the treated layer after the final hilling operation.

*Refer to each product label for the correct application band width.

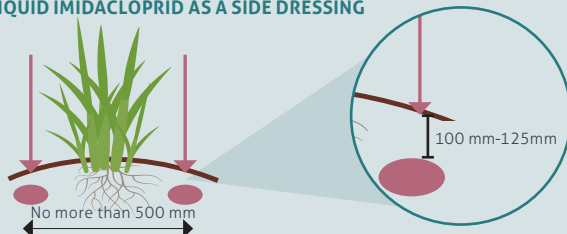
F.5A LIQUID IMIDACLOPRID BY STOOL SPLITTING



STOOL SPLITTING

- One slit in the centre of the stool.
- Slit depth 100-125 mm.
- Close the slot after application.

F.6A LIQUID IMIDACLOPRID AS A SIDE DRESSING



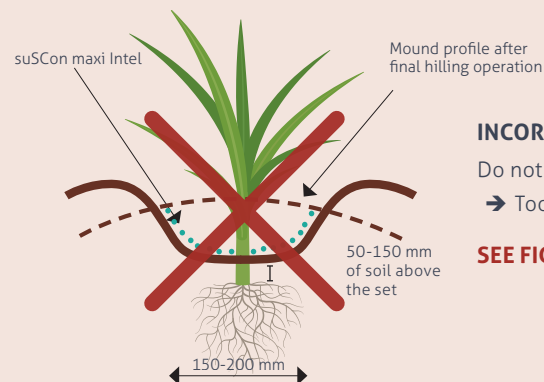
SIDE DRESSING

- Two slits no more than 500 mm apart.
- Slit depth 100-125 mm.
- Close the slots after application.
- Can be applied later than stool splitting but no later than November.

RATOON

INCORRECT APPLICATION FOR GREYBACK CANEGRUB

F.2B INCORRECT SUSCON MAXI INTEL APPLICATION AT HILL-IN OR HILL-UP

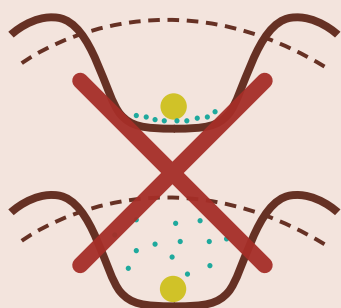


INCORRECT APPLICATION AT HILL-IN OR HILL-UP

- Do not apply a band wider than 200 mm
- Too diluted for adequate protection.

SEE FIGURE 2A FOR CORRECT APPLICATION

F.3B INCORRECT SUSCON MAXI INTEL APPLICATION AT PLANTING

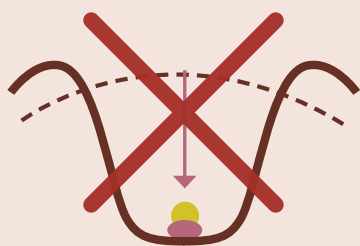


INCORRECT APPLICATION AT PLANTING

- Do not apply in a manner in which the granules fall below the sett at planting
- Too low in the soil profile for adequate protection against greyback cane grub.
- Do not mix throughout the soil profile at planting
- Too diluted for adequate protection
- Risk of runoff losses.
- Do not apply any wider than 200 mm.

SEE FIGURE 3A FOR CORRECT APPLICATION

F.4B INCORRECT LIQUID IMIDACLOPRID APPLICATION AT PLANTING



DO NOT APPLY WITH THE SETT AT PLANTING

- Too low in the soil profile
- Too early: insufficient active remaining when it is needed for grub control.

SEE FIGURE 4A FOR CORRECT APPLICATION

F.5B INCORRECT STOOL SPLITTING

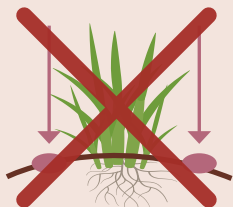


INCORRECT STOOL SPLITTING

- Do not surface apply.
- Do not apply shallower than 100 mm.
- Do not leave the slot open
- Risk of runoff and UV degradation.

SEE FIGURE 5A FOR CORRECT APPLICATION

F.6B INCORRECT SIDE DRESSING



INCORRECT SIDE DRESSING

- Do not surface apply.
- Do not apply shallower than 100 mm.
- Do not leave the slot open
- Risk of runoff and UV degradation.

SEE FIGURE 6A FOR CORRECT APPLICATION

CHEMICAL CONTROL

Although the life-stages targeted by chemical insecticide are the root-feeding early to late instars, which occur from January to May, insecticides are applied several months earlier. Because of the movement of the early and late instars in the soil it is important to ensure insecticide placement is made at the correct time, rate, depth and width to maximise this control option (Figure 2A - 6A).

Incorrect application of imidacloprid based products will result in inadequate protection from cane grubs, economic losses and potential environmental losses (Figure 2B - 6B).

When moderate to high grub pressure is expected (> 2 grubs / stool), use high label rates. Imidacloprid has three modes of action - it is toxic on ingestion, acts as a repellent and acts through contact with the grubs cuticle - therefore correct placement is essential to maximise efficacy (Figure 7).

Key references

Horsfield, A., et al. 2008. Role of climatic factors on damage incidence by *Dermolepida albohirtum* (Coleoptera: Scarabaeidae), in Burdekin sugarcane. *Journal of Economic Entomology* 101: 334-340.

Illingworth JF & Dodd AP. 1921. Australian sugar-cane beetles and their allies. *Bulletin of Queensland Bureau of Sugar Experiment Station, Division of Entomology* 16, 1-104.

Jarvis E. 1926. Notes on Queensland cane insects and their control. *Bureau of Sugar Experiment Stations, Division of Entomology Bulletin* 19, 1-72.

Sallam, N. 2011. Review of current knowledge on the population dynamics of *Dermolepida albohirtum* (Waterhouse) (Coleoptera: Scarabaeidae). *Australian Journal of Entomology*, 50: 300-308.

Ward, AL. 2003. Does soil texture influence the distribution of the greyback cane grub, *Dermolepida albohirtum* (Waterhouse) (Coleoptera: Scarabaeidae), in the Burdekin River sugarcane growing area? *Australian Journal of Agricultural Research* 54, 861-868

REGISTERED IMIDACLOPRID FORMULATIONS

- Liquid formulation: Nuprid® 350SC and a range of generic liquid brands
- Controlled release granule: suSCon maxi Intel®.

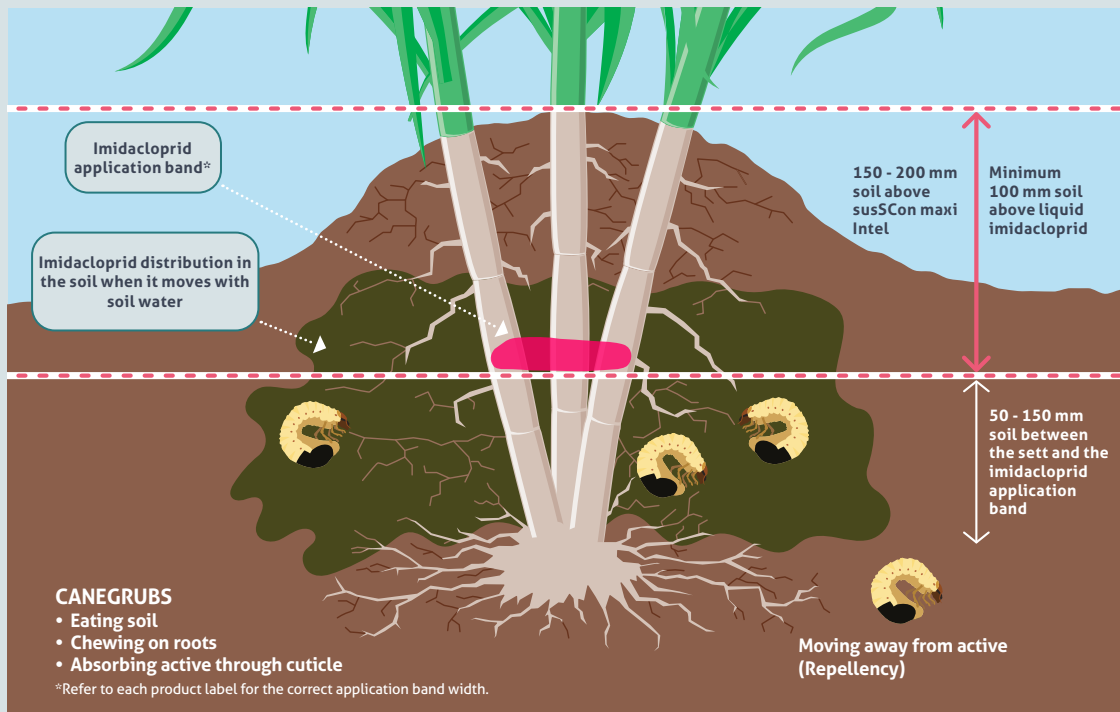
Rates of application are expressed in ml or g active per 100 linear metre of row, which means your rate per hectare varies with your row spacing (Table 1).

T1 RATE CONVERSION FOR IMIDACLOPRID PRODUCTS

	Rate per 100 linear metre row for high grub pressure	Rate per ha, 1.5 m row spacing	Rate per ha, 1.56 m row spacing	Rate per ha, 1.65 m row spacing	Rate per ha, 1.8 m row spacing	Rate per ha, 2m row spacing
Liquid (i.e. Nuprid® 350SC)	22 ml	1.47 L	1.41 L	1.33 L	1.22 L	1.1 L
suSCon maxi Intel®	225 g	15 kg	14.4 kg	13.9 kg	12.5 kg	11.25 kg

In dual row, apply half the rate on each row.

F.7 ILLUSTRATION OF OPTIMUM IMIDACLOPRID PLACEMENT FOR GREYBACK CANEGRUB CONTROL



Scan the QR to watch an animated video on placement of imidacloprid for Greyback Cane grub control.



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Sugar Research Australia Limited
ABN 16 163 670 068

Brisbane Office 50 Meiers Road, Indooroopilly QLD 4068 Australia
Postal Address PO Box 86 Indooroopilly QLD 4068 Australia

T 07 3331 3333

E sra@sugarresearch.com.au
sugarresearch.com.au

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