

KEEP OUT OF REACH OF CHILDREN

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BioShield®

GRASS GRUB LIQUID



Biological agent for
control of New Zealand
grass grub

(*Costelytra zealandica*)



Active ingredient:
Contains a minimum
of 4×10^{10} cfu/mL
Serratia entomophila
(strain G26) in the form of
a suspension concentrate.

Registered pursuant to the ACVM Act 1997. No.P7112
See www.foodsafety.govt.nz for registration conditions



Refrigerate at 4 °C out of direct sunlight

net contents **5L**

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Approved pursuant to HSNO Act 1996,
Approval code: HSR000001

See www.epa.govt.nz for approval conditions.



FIRST AID MEASURES

EYES: If liquid comes into contact with eyes, wash eyes with fresh water.

SKIN: Wash affected areas thoroughly with water (and soap if possible). Seek medical attention in the event of irritation.

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Produced and distributed by:
BioStart Limited, 216 Lake Rd, Hauraki,
Auckland 0622. Phone: 0800 116 229.
www.biostart.co.nz

BioStart BioShield® Grass Grub Liquid is a biological agent for the control of New Zealand grass grub (*Costelytra zealandica*). Use BioShield® Grass Grub Liquid to prevent a build-up of grass grub numbers. BioShield® Grass Grub Liquid starts a disease cycle in grass grub larvae that leads to a population decline thereby reducing the damage caused by the larvae. It does not affect humans, animals or any other insects.

General Information: BioShield® Grass Grub Liquid contains a naturally occurring soil bacterium (*Serratia entomophila*) that causes amber disease in the New Zealand grass grub. When BioShield® Grass Grub Liquid is ingested by the grass grub larvae it results in the cessation of feeding within 2-3 days. Death of the infected, non-feeding larvae may take 1-2 months to occur. Diseased larvae are characterised by a clear gut giving them an amber appearance. The dead grass grub larvae will not be visible as they disappear by natural decay processes.

DIRECTIONS FOR USE:

User Rate	Application	Application Timing
Apply BioShield® Grass Grub Liquid at 1 L/ha as a subsurface application to actively feeding grass grub larvae.	Dilute BioShield® Grass Grub Liquid in 100 L/ha of unchlorinated, clean water prior to application. Apply via a liquid applicator fitted to a seed drill (e.g. triple disc or direct drill) to a depth of 10-30mm below soil surface.	Apply to actively feeding grass grub larvae when they are in the late 2nd – mid-3rd instar stage of development. This stage occurs between February and mid-April .

NOTE: Assess grass grub larvae numbers in the area to be treated using standard sampling procedures. BioShield® Grass Grub Liquid works best when the **population density is between 100 and 300 larvae/m²**. Use BioShield® Grass Grub Liquid to prevent populations of grass grub growing above 300 larvae/m². Application to very high larvae populations will not prevent all pasture damage in the season of application. BioShield® Grass Grub Liquid will start a cycle of disease in the grass grubs that will lead to a population decline.

In areas where soils remain moist during the summer, e.g. North Island dairy pastures, applications can be made earlier against the early 2nd instar larvae. In dry east coast regions of both the North and South Islands, BioShield® Grass Grub Liquid should only be applied to irrigated pastures or where moisture can be maintained throughout the top 50mm of the soil profile through natural rainfall.

Do not apply BioShield® Grass Grub Liquid if the following conditions are present

- Soil temperature is below 10 °C
- Soil moisture is below 15%
- Grass grub larvae have developed past the mid-3rd instar stage of development (after April)

Post treatment management - Do not use;

- Alternative grass grub control practices such as heavy rolling or insecticide treatments after application as this will reduce the effectiveness of BioShield® Grass Grub Liquid.
- Cultivation following treatment as it is likely to reduce the effectiveness of BioShield® Grass Grub Liquid.
- Mob stocking of the treated paddock within the first six weeks after application of BioShield® Grass Grub Liquid to ensure the *Serratia entomophila* become established in the grass grub population, so setting up the long-term cycle of control.

It is an offence to use this product on animals.

BioShield® Grass Grub Liquid must not be applied directly on to or into water.

Withholding period: Nil

Compatibility: Call BioStart 0800 116 229 for a compatibility list.

Precautions: Avoid skin contact and inhalation of spray mist. Wash hands and exposed skin before meals and after work. Store in original packaging, tightly-closed away from children. Do not store diluted product.

Disposal of containers: Triple rinse container and return to an approved AgRecovery recycling centre.

Storage: Store under refrigeration (4 °C) at all times prior to application. Exposure to sunlight or warm temperatures will reduce viability. Keep out of each of children.

