

BioShield® Grass Grub

Does your paddock require treatment with BioShield® Grass Grub?

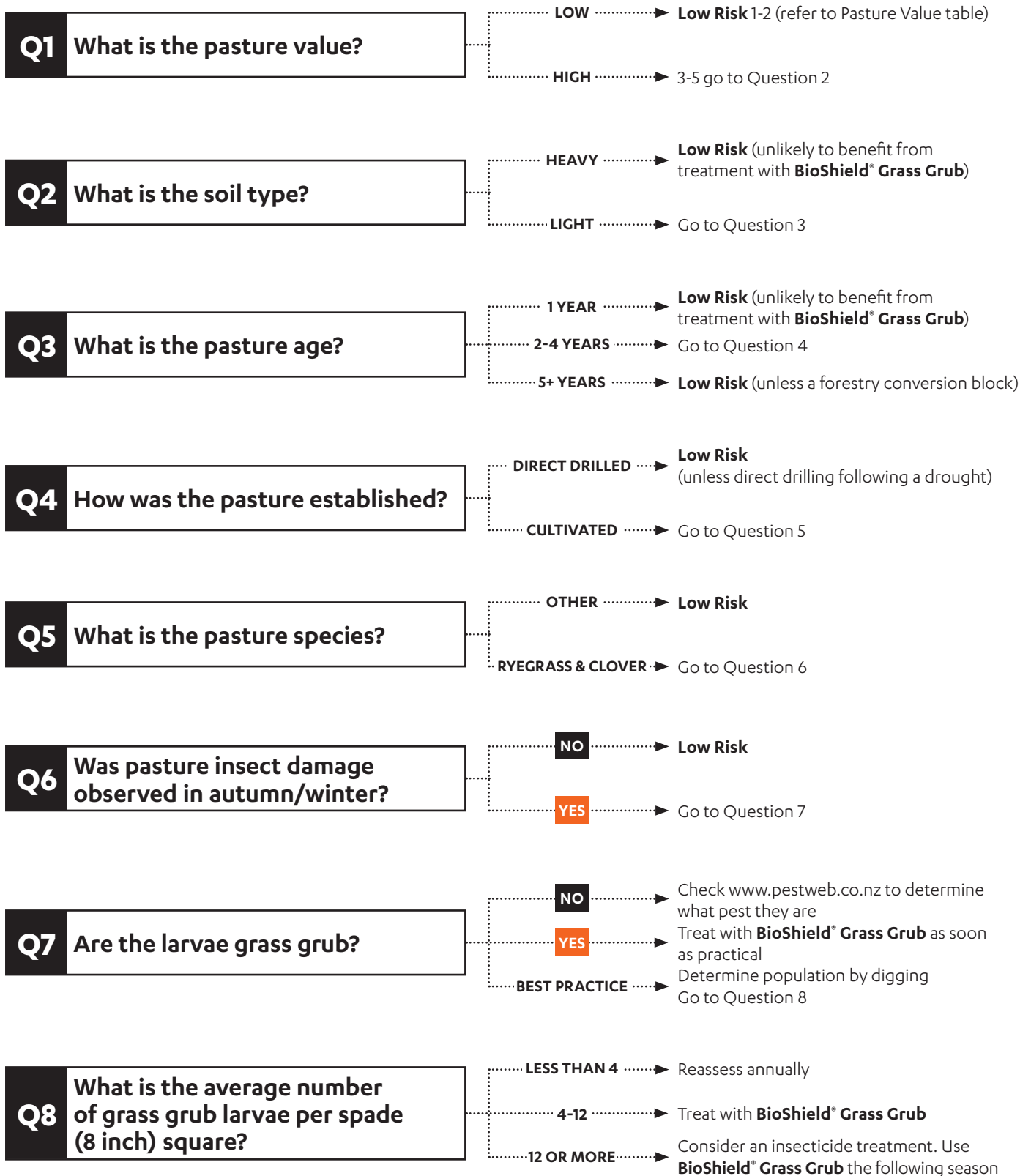


BioShield® Grass Grub is a biological control treatment that is effective against New Zealand grass grub. **BioShield® Grass Grub** is available in an easy-flow granule format, and provides effective long-term control of New Zealand grass grub. However, as it is a biological control agent its effectiveness depends on accurate paddock selection and correct product usage.

The paddock selection decision tree overleaf and other information in this booklet will help you to determine whether or not you have a grass grub problem that can be treated with **BioShield® Grass Grub**. Only paddocks with between 100 and 300 grass grubs/m² are suitable for treating with **BioShield® Grass Grub**. It may not be economic to treat paddocks with significantly higher populations.

The decision tree will identify paddocks most at risk of grass grub damage. For confirmation, it may be useful to sample the paddock. This is done by digging 10 or more spade squares to a depth of 10-15 cm from throughout the paddock, and hand-sifting through the soil to collect grass grub larvae. If a 20 cm (8 inch) width spade is used, an average of four larvae per spade square is approximately 100/m². (If a 15 cm (6 inch) width spade is used, 100/m² is represented by about 2 larvae per spade square). With February sampling, larvae are small and hard to find. Ideally sampling was conducted last season.

Paddock selection decision tree



Pasture value

Should the pasture be protected with **BioShield® Grass Grub**, or renovated – depends on how productive it is.

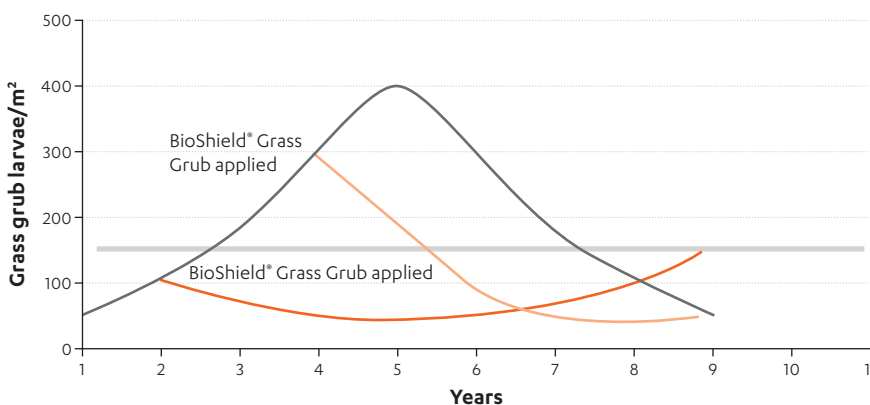
Pasture value	Score criteria	Action
5	Composition predominantly retaining sown species; high genetic merit cultivars. Less than 3 years since sowing. High value pasture with perceived risk from grass grub.	Clear candidate for treatment with BioShield® Grass Grub to reduce grass grub population.
4	Composition retaining a minimum of 80% of sown species; high genetic merit cultivars. Less than 3 years since sown. High value pasture with perceived risk from grass grub.	Clear candidate for treatment to reduce grass grub population. Consider “stitching-in” grass seed with treatment.
3	Composition retaining around 60% of sown species, but cover patchy and/or not likely to have high genetic merit cultivars.	Close evaluation needed of potential return on investment in grass grub control and/or under- sowing with new pasture species.
2	Composition retaining less than 50% of sown species.	Will most likely require complete renewal.
1	Low value pasture (low quality, low dry matter production).	Requires complete renewal.

Quick reference guide

New Zealand grass grub		Manuka beetle	Tasmanian grass grub	Porina	Black beetle
Healthy second-instar grass grub larva	Diseased second-instar grass grub larva	Manuka beetle larva	Tasmanian grass grub larva	Porina larva	Black beetle larva
Grass grub beetle		Manuka beetle	Tasmanian beetle	Porina moth	Black beetle

(For more information visit: www.pestweb.co.nz)

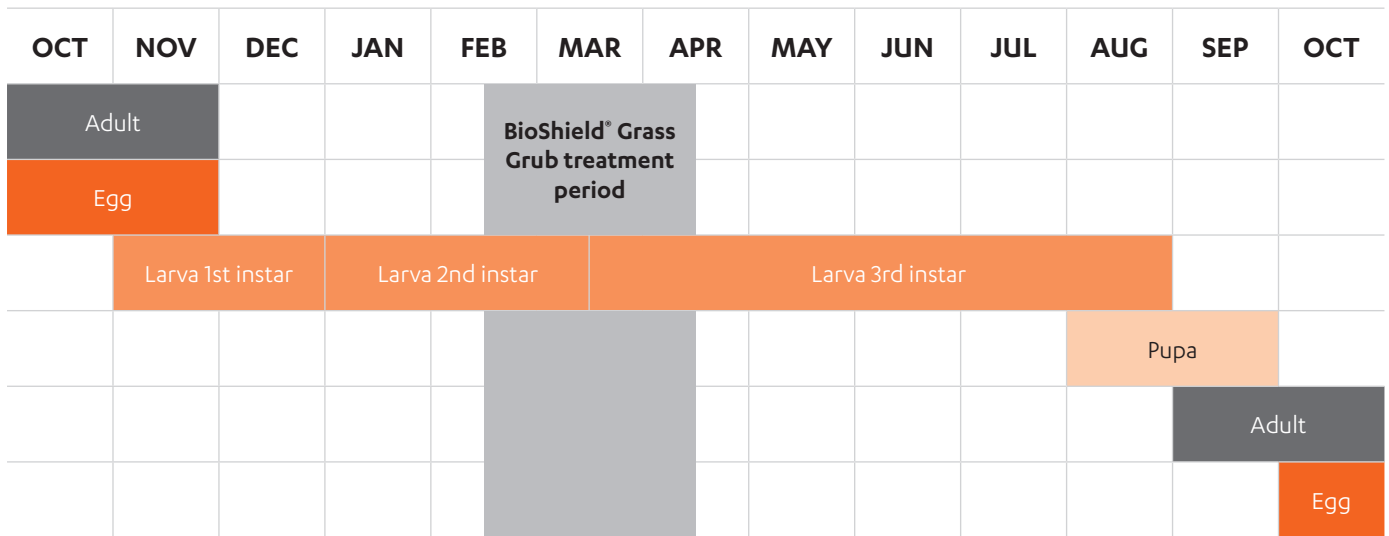
Simulated effect of adding BioShield® Grass Grub: Pre-outbreak & post-outbreak grass grub populations



- Normal population curve if grass grub not treated
- Population curve if **BioShield® Grass Grub** used when grub numbers are relatively low (pre-outbreak)
- Population curve if grass grub problem treated with **BioShield® Grass Grub** (post-outbreak)

This information was developed in consultation with AgResearch.

New Zealand grass grub life cycle



BioShield® Grass Grub economic scenario

From the initial grass grub damage this farm scenario benefited by \$36,000 from treating with **BioShield® Grass Grub**. The benefit from treatment over a 3 year period would be over \$70,000 for this farm.

Description	Here is how...	
The context	<ul style="list-style-type: none"> Dairy farm with free draining soils, has 400 cows on 132 hectares. The farm has grass grub damage on 30% of the farm resulting in 10% loss in annual pasture production in the first year increasing in the next two years by 10% per year if untreated. Annually 15 tonne of DM/ha is grown and 12.5 tonne is consumed by the cows. 	
	Do nothing	Treatment with BioShield® Grass Grub
Base year	<ul style="list-style-type: none"> 10% loss 50 t DM loss (12.5t x 10% x 40 ha) 	<ul style="list-style-type: none"> 10% loss 50 t DM loss (12.5t x 10% x 40 ha)
Cost of BioShield® Grass Grub treatment	<ul style="list-style-type: none"> No cost 	<ul style="list-style-type: none"> \$14,000 (one off cost) @ \$350 / ha x 40 ha (includes drilling)
After 1 year	<ul style="list-style-type: none"> 20% loss 100 t DM loss (12.5t x 20% x 40ha) 	<ul style="list-style-type: none"> 5% loss 25 t DM loss (12.5t x 5% x 40 ha)
After 2 years	<ul style="list-style-type: none"> 30% loss 150 t DM loss (12.5t x 30% x 40ha) 	<ul style="list-style-type: none"> 5% loss 25 t DM loss (12.5t x 5% x 40 ha)
Total cost of lost pasture after 3 years	<ul style="list-style-type: none"> 300 t DM loss valued at \$0.25/kg DM \$75,000 	<ul style="list-style-type: none"> 100 t DM loss valued at \$0.25kg DM \$25,000
Benefit from treatment with BioShield® Grass Grub	<ul style="list-style-type: none"> Loss from no treatment over 3 years is \$75,000 Minus loss when treated \$25,000 equals \$50,000 gross benefit Minus cost of BioShield® Grass Grub treatment of \$14,000 Delivers a net financial benefit of \$36,000 on this farm. 	

This scenario has been developed to demonstrate the cost of grass grub damage and an economic return that can be achieved by treatment with **BioShield® Grass Grub**. The scenario is based on **BioShield® Grass Grub** granule RRP \$107.50 excluding GST per 15 kg bag at an application rate of 30 kg/ha i.e. \$215 per hectare.

Feel free to customise this scenario by using your own farm figures.