



**BREAKTHROUGH TECHNOLOGY**  
BIRD AND INSECT DETERRENT GRASSES

**SPORTS  
FIELDS**



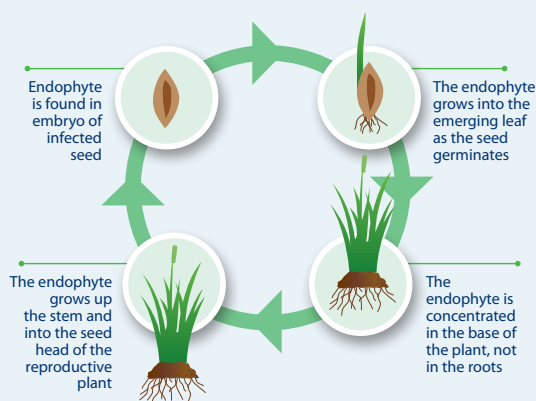
## AVANEX® UNIQUE ENDOPHYTE TECHNOLOGY: A POTENTIAL TOOL FOR SPORTS FIELDS

AVANEX® Unique Endophyte Technology may assist in reducing the number of birds and insects on sports fields. The alkaloids produced by the Endophyte not only reduces the number of insects but can also reduce the number of birds on sports fields.

In trials grasses with AVANEX® have been shown to reduce insect numbers and as a result the area is less attractive to insect feeding birds; in turn this may also reduce the reliance on pesticides for the control of turf damaging insects. Grasses with AVANEX® Unique Endophyte Technology also reduces bird populations through post digestion feedback (where birds that feed directly on the grass feel ill after feeding and learn to avoid the area).

### WHAT IS ENDOPHYTE?

Endophyte is a natural fungus found in many ryegrass and tall fescue species. The fungal strands grow between the plant cells, and transmit themselves to the next grass generation by growing into the developing seed and into subsequent grass seedling.



HAGLEY OVAL, CHRISTCHURCH, NEW ZEALAND, SOWN IN  
COLOSSEUM WITH AVANEX®

### HOW AVANEX® UNIQUE ENDOPHYTE TECHNOLOGY WORKS

- Grasses with AVANEX® Unique Endophyte Technology produce high levels of alkaloids including ergovaline, loline and peramine
- These alkaloids contribute to lower insect populations through insect deterring properties and are an environmental way to reduce the use of insecticides to control many turf insects
- Ergovaline contributes to post digestion feedback (PDF) malaise of Canada Geese

### WHERE TO USE AVANEX® UNIQUE ENDOPHYTE TECHNOLOGY

- **Sports fields** – for insect free playing surfaces and less excreted waste from grass feeding birds
- **Amenity areas** – for cleaner playing surfaces
- **Waterways and reservoirs** – to reduce bird numbers with potentially less fouling
- **Areas where reduced reliance** on pesticides for insect control is required

### MAJOR FINDINGS

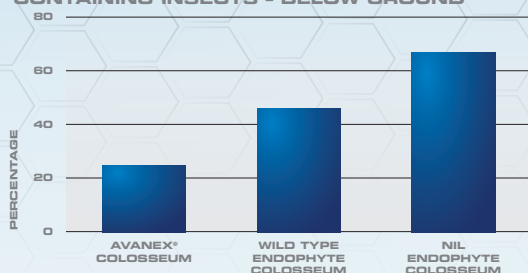
- 1 Shown to reduce insect populations which can potentially lead to lower numbers of insect feeding birds
- 2 Shown to reduce numbers of grass feeding birds (Canada Geese) through confirmed learning avoidance behaviour of post digestion feedback (PDF) malaise
- 3 Anecdotal comments on reduced number of grass feeding animals (rabbits, mice etc), with ongoing trials to confirm this
- 4 Improved plant persistence leading to longer surviving grass areas



## TRIAL RESULTS ON AVANEX® UNIQUE ENDOPHYTE TECHNOLOGY

### INSECT TRIALS

FIGURE 1: PERCENTAGE OF CORES CONTAINING INSECTS - BELOW GROUND



AVANEX® COLOSSEUM HAS A SIGNIFICANTLY LOWER PERCENTAGE OF INSECTS BELOW GROUND COMPARED TO WILD TYPE AND NIL ENDOPHYTE

FIGURE 2: INSECT DRY WEIGHT - ABOVE GROUND OVER 3 YEARS

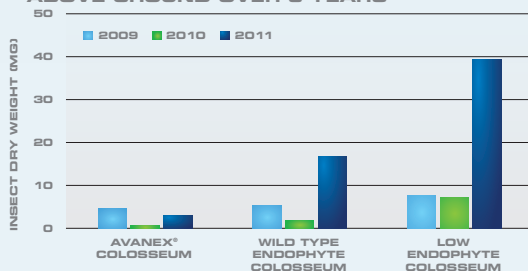


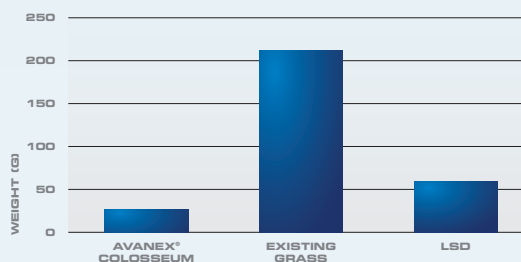
FIGURE 2 INDICATES STRONG STABILITY IN AVANEX® COLOSSEUM OVER A 3 YEAR PERIOD WHEN COMPARING TO WILD TYPE AND LOW ENDOPHYTE COLOSSEUM

### BIRD TRIALS



TRIAL SHOWING PREFERENTIAL GRAZING ON NIL ENDOPHYTE GRASS (RED BOX) IN COMPARISON TO AVANEX® GRASSES (OUTSIDE BOX)

FIGURE 3: BIRD FAECAL COUNT POST GRAZING



AVANEX® COLOSSEUM HAD SIGNIFICANTLY LESS BIRD FAECAL COUNT THAN EXISTING GRASS

## SUCCESS WITH AVANEX® QUEENSTOWN EVENTS CENTRE

### AVANEX® COLOSSEUM

As part of The Queenstown Event Centre's strategic plan, to be a training venue for the 2011 Rugby World Cup, they wanted to improve the turf cover on their main oval ground. For years this had been a mixture of browntop, *Poa annua* and a small percentage of ryegrass. They undertook a programme of applying a worm control during spring 2010, sprayed Nortron® for *Poa annua* control in September 2010 and oversowed ryegrass into the oval by way of dimple seeder in November 2010. The plan was to have this establish over the growing season and then direct drill more into the rugby field area on the oval in the autumn.



FORSYTH BARR STADIUM, DUNEDIN, NEW ZEALAND

"We decided after considering certain criteria to go with PGG Wrightson Turf's AvaneX® Colosseum as our preferred option".

This decision was arrived at for these main reasons:

- Our grounds are bordering the Queenstown International airport so it is so important to have awareness about bird activity
- This product has been developed with an endophyte that birds do not like
- This product has been developed with an endophyte that discourages insect activity
- This criteria is vital to our operation with our location being so close to the airport
- The proof we were after has been impressive so far
- The bird activity decrease was not immediate with birds still being around the oval from time to time that growing season

"It seems now after the second growing season is behind us that since the establishment of the AvaneX® Colosseum that the bird activity is nonexistent. Also this growing season, issues with Porina and grass grub on the oval seem to have disappeared. It is our intention to use as much AvaneX® Colosseum as our budget will allow in the future on our other fields. We have been very happy with the results thus far".

Peter Domigan - Queenstown Events Centre



## FEATURES OF AVANEX® UNIQUE ENDOPHYTE TECHNOLOGY

- **Contains Unique Endophyte (a naturally occurring fungus)**
- **Produces high levels of alkaloids**
- **Available in tall fescue and perennial ryegrass**

## BENEFITS OF USING AVANEX® UNIQUE ENDOPHYTE TECHNOLOGY

- **Can reduce insect populations and resident bird populations**
- **Is cost effective and can save you money in the long term**

## INTELLECTUAL PROPERTY PROTECTION

AR601 endophyte is protected by New Zealand Patent Application 579801, USA Patent Application 8101400, Australia Patent pending 2008 244736, Europe Patent pending 08753855, Argentina Patent pending 8010793 and Uruguay Patent pending 31.054. Harvesting/propagating, re-sowing, and/or on-selling AR601 seed may infringe these patents and may result in prosecution. The AR601 endophyte is protected under the New Zealand Plant Variety Rights Act 1987 and Australian Plant Breeder's Rights Act 1994.

AR94 endophyte is protected by New Zealand Patent pending 579801, Australia Patent pending 2008244736, USA Patent pending 13/308939, Uruguay Patent pending 31.054, Argentina Patent pending 08010793, and European Patent Pending 08753855.9. Harvesting/propagating, re-sowing, and/or on-selling AR94 seed may infringe these patents and may result in prosecution.

AR95 endophyte is protected by New Zealand Plant Variety Rights Act 1987, Australian Plant Breeders Rights Act 1994, and European Plant Variety Rights Application 2011/2143.

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Grasslanz is a registered trademark of Grasslanz Technology in New Zealand and Australia.

**WARNING: THIS GRASS VARIETY CONTAINS A NOVEL ENDOPHYTE. INGESTION OF THE SEED OR THE GRASS CAN CAUSE SEVERE ADVERSE ANIMAL HEALTH ISSUES AND IS NOT TO BE USED AS FEED FOR ANIMALS AND BIRDS. IN SEVERE SITUATIONS IT MAY CAUSE DEATH TO GRAZING ANIMALS.**

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[WWW.AVANEXGRASS.COM](http://WWW.AVANEXGRASS.COM)

## CONTACT US

**NEW ZEALAND**  
03 372 8719 or 09 5702570  
[info@pggwrightsonturf.co.nz](mailto:info@pggwrightsonturf.co.nz)  
[pggwrightsonturf.co.nz](http://pggwrightsonturf.co.nz)

**AUSTRALIA**  
1800 DURATURF  
[info@pggwrightsonturf.com.au](mailto:info@pggwrightsonturf.com.au)  
[pggwrightsonturf.com.au](http://pggwrightsonturf.com.au)

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