

AR37 Ryegrass Endophyte

AR37 is a novel endophyte developed by AgResearch Grasslands, along with commercial partners Agricom, Wrightson Seeds, Meat & Wool NZ, Grasslanz and FRST.

AR37 produces a unique range of alkaloids called Epoxy-janthitrem. Epoxy-janthitrem have never been found in any other ryegrass/endophyte association. Epoxy-janthitrem probably have a role in activity against insects, while having no adverse effect on animal production. Epoxy-janthitrem may be a cause of ryegrass staggers.

AR37 has a number of benefits including improved insect resistance, livestock performance in pure sward and agronomic performance. See Table 1 on which endophyte to select.

Ryegrass with **AR37** has resistance to a wider range of insects than all other commercially available endophytes (Table 1 and Figure 2).

		Endophyte free	AR1	AR37	SE
Resistance to Insect Pests	Argentine Stem Weevil	Nil	◆◆◆◆	◆◆◆◆	◆◆◆◆
	Porina	Nil	Nil	◆◆◆◆	◆
	Mealy Bug	Nil	◆◆◆◆	◆◆◆◆	◆◆◆◆
	Root Aphid	Nil	Nil	◆◆◆◆	◆
	Black Beetle	Nil	◆	◆◆◆◆	◆◆◆◆
	Grass Grub	Nil	NT	◆	◆
	Livestock Performance	Occurrence of Ryegrass Staggers	Nil	Nil	Slight
	Presence of Ergovaline	Nil	Nil	Nil	High
	Animal Performance	◆◆◆◆	◆◆◆◆	◆◆◆◆	◆
Agronomic Performance	Drymatter Production	◆◆	◆◆◆	◆◆◆◆	◆◆◆
	Persistence	◆	◆◆	◆◆◆◆	◆◆◆

◆ = poor; ◆◆◆◆ = excellent, NT = Not tested by AgResearch

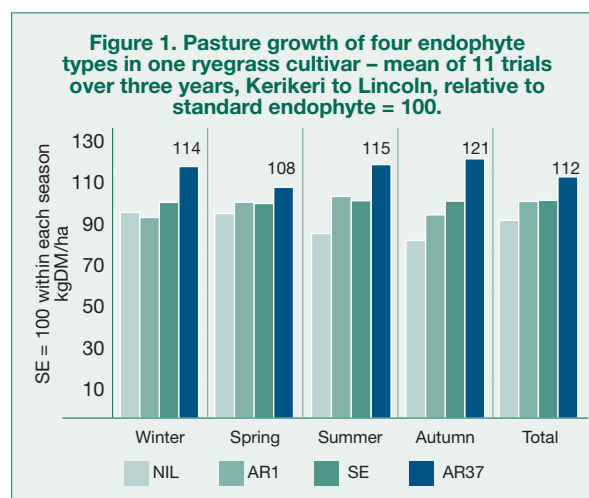
How do animals perform on AR37?

Ryegrass with **AR37** has been tested by AgResearch for liveweight gain in sheep, with animal performance being the same as ryegrass without endophyte, and **AR1** ryegrass. Sheep performance is considerably better than with standard endophyte. The incidence of dags is low, as with **AR1**.

What animal health issues are associated with AR37?

AR37 does not cause heat stress or other animal effects associated with high levels of ergovaline.

Although **AR37** does not contain lolitrem B it can cause ryegrass staggers. Trials have shown that on average the frequency, duration and severity of ryegrass staggers is less than for standard endophyte. However on occasions sheep (and potentially other animals) grazing **AR37** ryegrass may be severely affected for short periods. To date no ryegrass staggers have been reported on dairy cows grazing on **AR37** ryegrass. Due to the fact that no trial work has been undertaken on deer and horses, pastures with **AR37** are not currently recommended for these classes of livestock.




Agronomic Performance

AR37 inoculated ryegrass produces higher levels of ryegrass growth than the same varieties with **AR1** or standard endophyte (Figure 1). This advantage occurs in situations without obvious insect damage, but is more pronounced in environments with greater stress and/or insect pressure.


AR37 ryegrasses also show improved persistence, with higher tiller densities over time when compared to nil endophyte or standard endophyte ryegrass.

	% Survival of Porina	No. Root Aphid/Plant
Nil endophyte	95	283
Standard endophyte	50	190
AR37	5	1

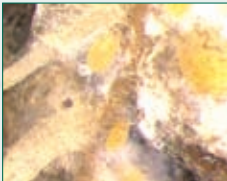
Figure 2. AR37 Provides Resistance To These Key Pests




Black Beetle
Northland, Waikato, Bay of Plenty, East Coast, Hawkes Bay & Coastal Taranaki




Argentine Stem Weevil
New Zealand wide



Root Aphid
New Zealand wide



Pasture Mealy Bug
New Zealand wide



Porina*
New Zealand wide, especially areas with moist and cloudy summers

* Early field trial results confirmed laboratory evidence of resistance of ryegrass with AR37 to porina.
Note, in pastures with AR37 ryegrass, porina can be present and feed on other pasture mix components, e.g. clover.