

New endophyte developments

The deleterious effects of the standard endophyte in ryegrass are well understood - staggers, heat stress, reduced production and deaths, which have cost Australian farmers millions over the past decade alone. However, farmers have faced a quandary - do they stick with standard (sometimes also called 'feral', 'wild' or 'wild type') endophyte varieties which, despite these losses, still persist and produce well or use Nil or ARI endophyte lines which are not as persistent. A number of options are now available and the decision is getting easier, although it will remain a question of balancing the risks against the benefits for some time as there is no 'perfect' endophyte.

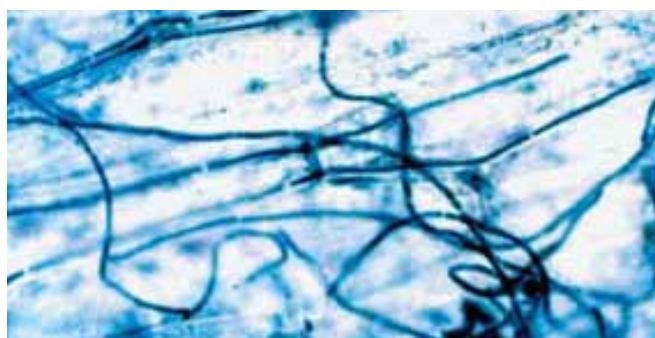


Figure 1: Photograph of endophyte under the microscope. The endophyte fungus hyphae are the strands between the plant cells.

Endophyte options

NIL. Wrightson Seeds has decided that nil endophyte ryegrasses, which produce no endophyte toxins (see Table 1 below) do not persist or produce well enough for us to market them in Australia.

STANDARD. Standard endophytes (see above Figure) may still have a place in the Australian market providing farmers are well aware of the risk and adopt appropriate management strategies. They do provide excellent protection against pests, and therefore good persistence, and can be considerably cheaper than ryegrasses with novel endophytes.

ARI. The ARI endophyte does not produce lolitrem B or ergovaline, which are known to affect animal health, and is very safe on animals and we believe it is the ideal endophyte

Table 1: Endophyte toxin status

Endophyte type	Peramine	Lolitrem B	Ergovaline	Janthotrems
Nil	X	X	X	X
Standard	✓	✓	✓	X
AR1	✓	X	X	X
Endo 5	✓	X	✓	X
AR37	X	X	X	✓

for farmers grazing horses, deer or alpacas and for irrigated pastures with very little pest pressure where persistence is not a major issue.

However, it only provides a moderate level of insect protection for the control of pasture mealy bug and Argentine stem weevil. The poor control of black beetle is well recognised but at Ballarat, where we don't have black beetle, we have found that dry matter production from AR1 still starts declining after the second year or so. Wrightson Seeds are selling Extreme[®] ARI and Quartet AR1 and we anticipate selling other ARI products in the future.

ENDO5. Because we saw that Banquet[®] II had wide applicability across Australia, we were concerned that it should not be compromised by an endophyte that would not allow it to reach its full potential. We have developed a new endophyte for Banquet[®] II –endo5 which has been specifically selected to produce peramine and low levels of ergovaline. Ergovaline can, under some circumstances, affect animal performance but Banquet[®] II was specifically selected to elicit low levels and mainly in the crown of the plant below grazing height. Endo5 does not produce Lolitrem B which causes ryegrass staggers. Endo5 provides tetraploid ryegrasses with resistance to Argentine Stem Weevil, Pasture Mealy Bug and Black Beetle and tolerance to root aphid. Persistence of Banquet[®] II in Australian trials has been excellent.

AR37. At this stage Wrightson Seeds in Australia does not sell a ryegrass with the AR37 endophyte but anticipate making it available soon. The AR37 is a different endophyte in that it produces an alkaloid not previously seen in novel endophytes – janthotrems. AR37 provides the best available insect protection of any endophyte – better even than the wild type. It improves tiller density and persistence and maximises animal performance. There is a small cost – it can cause staggers but extensive research in New Zealand has shown that the staggers were less frequent, less severe and of shorter duration than with wild endophyte and animal performance has not been affected. Follow up research will be carried out in Australia this year but at this stage we are very excited about the prospects for AR37.

For more information on endophyte please call Wrightson Seeds on FREECALL 1800 619 910 or visit www.wrightson.net.au.