



Developing great endophytes

Ryegrass endophyte

Endophytes

We have the biggest range of endophytes you can buy. Why? This allows our breeders to pair the best ryegrass with the most appropriate endophyte to create the greatest synergy. This is a complex process of trial and error, but it enables us to use the best ryegrass rather than just the ryegrass that will accept a particular endophyte.

Introduction

We're often asked, what is the best endophyte? After decades of research we can tell you it's not that simple. Our job is to breed the best pastures you can grow. That means pairing the right grass genetics with the right endophyte to create powerful partnerships that can work wonders on your farm.

No one size fits all

Different strains of endophyte vary in their effect on ryegrass. In one case, we even found a parasitic endophyte! It significantly depressed ryegrass yield, and made it more susceptible to disease, disastrous effects we do not want on farms. Some endophytes seem to do nothing. Others reduce winter growth, or can increase autumn growth.

Teamwork makes the dream work

A good example? Releasing *NEA12* endophyte in *Shogun* and *Maxsyn*, because we've found these to be superb marriages. The data tells the story - *NEA12* boosts the total yield of *Shogun* by 7%, and *Maxsyn* by 4%.

For context, plant breeding normally lifts ryegrass yield by +1% a year, so these partnerships equal 4-7 years of genetic gain in one hit. Imagine achieving that in your animals!

Likewise we released *Forge* ryegrass with *NEA*, because again, this is the right match for best performance. When we tried *NEA12* in *Forge*, yield dropped 5%.



Molecular analysis

Our endophyte R&D began decades ago with a chance discovery in ryegrass seed collected by hand in Spain, and has progressed to cutting edge biotechnology.

We have genetically screened over 400 potential endophytes. Those that reach commercialisation are genotyped and molecular markers developed so their presence can be detected easily.

Insect screening

We assess insect control early in the development of our new endophytes using in both on-farm field trials, and specific greenhouse screening.

For example in Argentine stem weevil (ASW) greenhouse testing, plants of the same ryegrass cultivar with a range of endophytes are planted in pots.

Then adult ASW are placed in each pot and confined by mesh covers so we can compare egg laying and feeding damage on each ryegrass x endophyte combination.



Animal health

To assess the ryegrass staggers risk, animal health and performance of different endophyte strains we use lambs, as they are more sensitive than cattle.

Under careful supervision, following ethical standards, separate mobs are set-stocked for up to 8 weeks on pure swards of perennial ryegrass grown to a high herbage mass in February and March when the endophyte alkaloids are highest. This is not normal or recommended farm practice but is designed to ensure we identify any detrimental effects under these poor management scenarios.

Lambs are assessed for ryegrass staggers and liveweight gain throughout the trial.



An animal trial in late February. Each separate 0.3ha block is a specific ryegrass x endophyte combination, and the animals on each block are closely monitored.



Field testing

Commercial field tests are also used to mirror real world conditions. Many are run on farms selected for known pasture persistence problems. Insect issues combined with climatic stress and typically over-grazing to further test endophyte performance.



Under severe ASW attack in Hawkes Bay, a plot of ryegrass with an NEA endophyte (left) stands out against cultivars with no endophyte (right).

ETC

Barenbrug supports the industry Endophyte Technical Committee (ETC), which is administered by the PBRA¹. The ETC assesses the trial information companies collect on their endophytes and summarises this into agreed industry insect control and animal safety ratings. These are presented under Endophyte insect control ratings and Endophyte animal safety ratings.

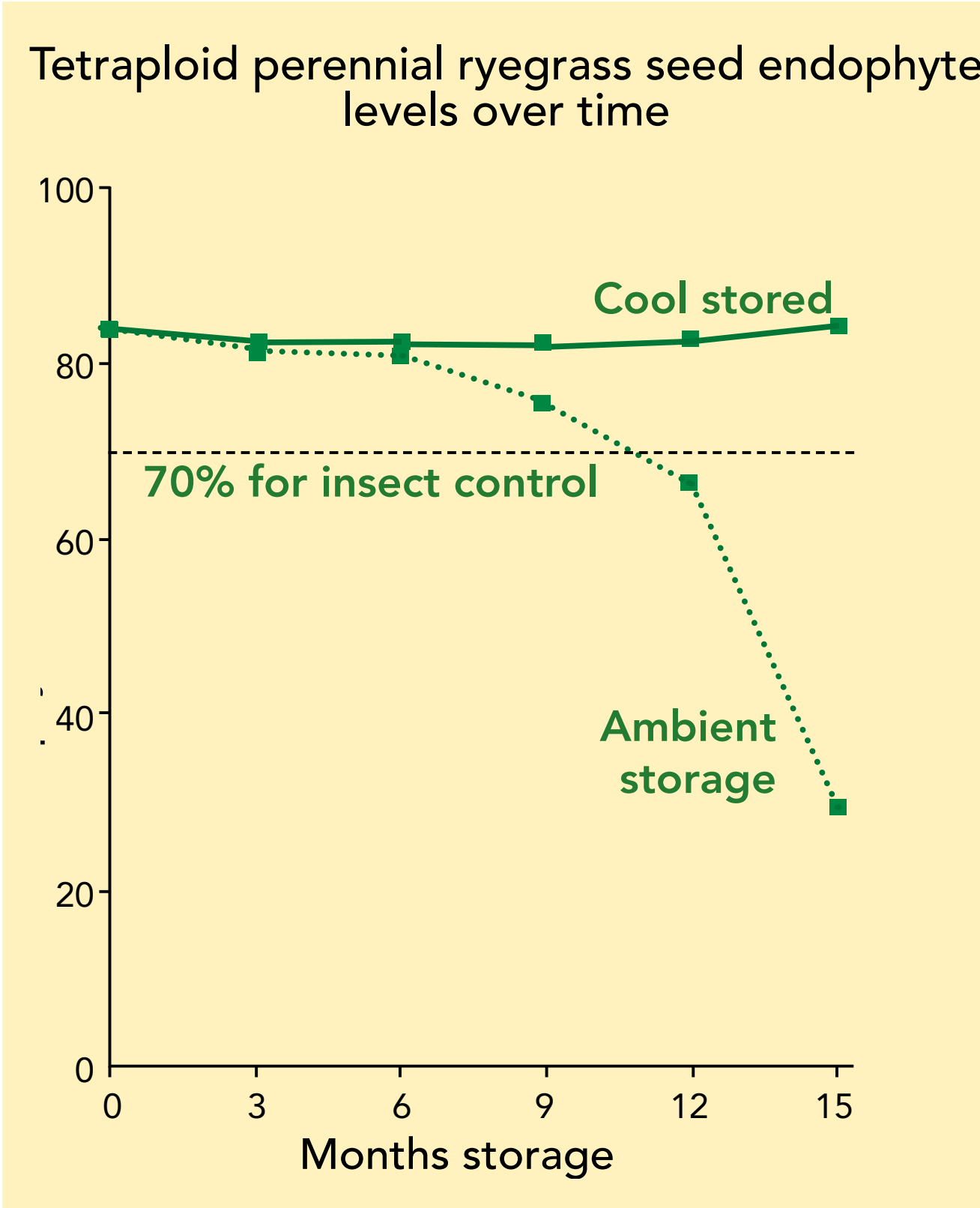
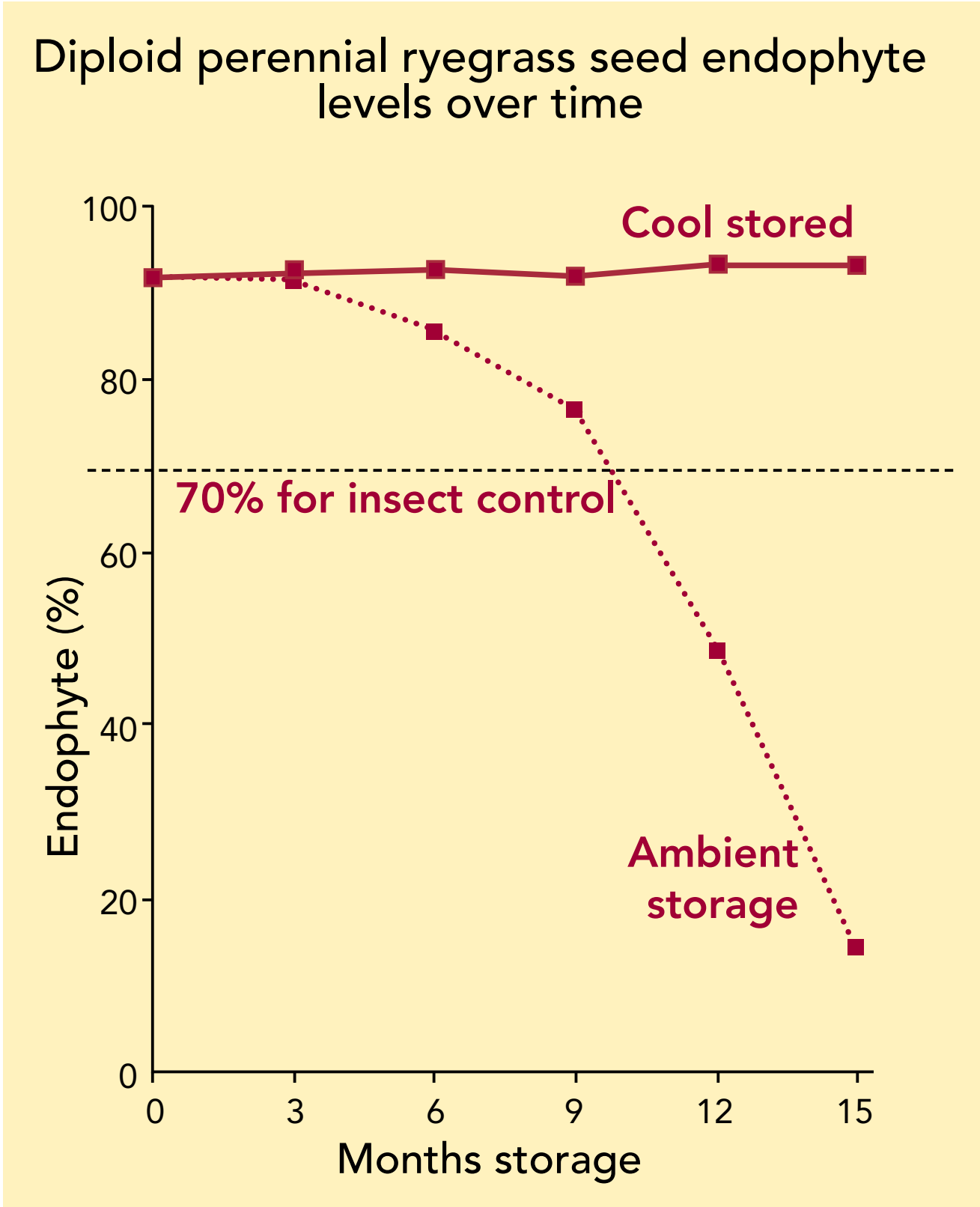
¹ PBRA, For more see: www.pbra.co.nz

Handled with care

Endophyte is fragile. It dies fast in the wrong conditions. So we've built New Zealand's best supply chain infrastructure to keep our endophytic seed safe.

What does the science say?

New research¹ reveals what happens when endophytic seed is stored poorly, and it's not good. These graphs show the results.



Why does it matter?

Perennial and hybrid ryegrass seed is usually not ready to sow in the autumn it is harvested. There is not enough time to process and test it. So most seed is at least a year old before it's sold.

If it hasn't been looked after and cool stored during that time, odds are the endophyte is no longer viable when seed goes in the ground.

Our ongoing investment

In 2025 we opened our purpose-built upper North Island cool store, to improve our cool chain to keep endophytic ryegrass seed in optimal conditions.

Combined with our three existing Canterbury cool stores, plus just-in-time delivery, this new facility raises a high bar for seed stewardship. We believe our system is now the industry's best, so you can rely on Barenbrug seed to reach farmers ready to perform.

¹34th ISTA Congress 2025, Thant. A, et al.



One of Barenbrug's four controlled humidity cool stores, this one at our Rolleston distribution hub.

Better pasture together™

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