



IMPROVING CROP HEALTH AND YIELD IN PULSE CROPS WITH MYCORRHIZAL FUNGI

EndoFuse™ from Sumitomo Chemical is an arbuscular mycorrhizal fungi (AMF) inoculant used to maximise crop growth potential through harnessing the natural symbiosis that exists between plants and AMF.

Mycorrhizal fungi are beneficial fungi that naturally exist in soils colonising the root systems of plants. EndoFuse includes 4 high performing endo-mycorrhizae species that have been proven highly beneficial to many crop species.

EndoFuse is highly beneficial to grain legume crops, helping with:

- Crop resilience under plant stress conditions
- Crop yield
- Improved rhizobium nodulation and efficiency
- Increased root and shoot biomass
- N, P, K and trace element uptake
- Water uptake during moisture stress
- Improved resilience against disease and pest attack
- Soil and plant health



Boost productivity following canola

Growing canola will deplete mycorrhizae levels in the soil and can often result in lower productivity of the following crops. Certain plant species like canola are non-mycorrhizal, meaning they do not form a symbiosis with mycorrhizae and therefore levels in the soil will be run down after these crops are grown.

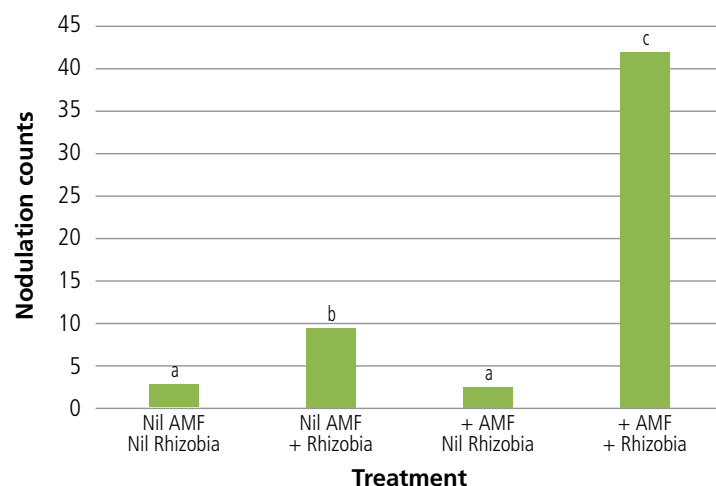
Prevent long fallow disorder

Mycorrhizae require live plants to survive and grow, hence levels are often significantly reduced after a fallow period of 6 months or more. Treating crops with EndoFuse following fallow periods will reduce the chance of long fallow disorder and underperforming crops.

Boost rhizobium nodulation and activity

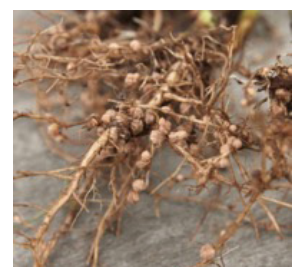
Mycorrhizae and rhizobium have evolved together in the soil over millions of years and trials have shown they are highly complementary to each other and to the host legume plants when co-colonised. Trials regularly show that legume crops inoculated with both AMF and rhizobium produce more and larger nodules and significantly improved growth versus when only one of the inoculants is used alone.

University of Southern Queensland – AMF and rhizobia trial in mung beans, 2020 – Root nodulation counts



Elaine Gough, Kirsty Owen, Rebecca Zwart, Alla Marchuk and John Thompson, Centre for Crop Health, USQ.

AMF and rhizobia increase nodulation 4.5-fold compared to rhizobia alone in mung bean cv. Jade-AU. Different letters indicate significant differences at $P=0.05$.



Ensuring a strong colonisation of roots with AMF significantly boosts rhizobia nodulation and subsequently plant growth in legume crops.



Increased nutrient uptake

In addition to increasing the surface absorbing area of roots, Mycorrhizal fungi also release powerful chemicals that dissolve tied up nutrients such as phosphorous, zinc and other tightly bound soil nutrients. Mycorrhizal fungi form an intricate web capturing and assimilating nutrients, thus better utilising the nutrient capital already in soils.

Easy application

EndoFuse can be applied as a seed treatment or as an in-furrow spray or injection. Use rate is 10-15 mL per ha.

When treating pulse crops with a rhizobia inoculant it is ideal to mix EndoFuse and the rhizobia together in a single slurry. In most cases EndoFuse can be treated over the top of any pre-treated seed without any issues (check compatibility with a Sumitomo representative).

NSW DPI Chickpea AMF trial – Tamworth 2021

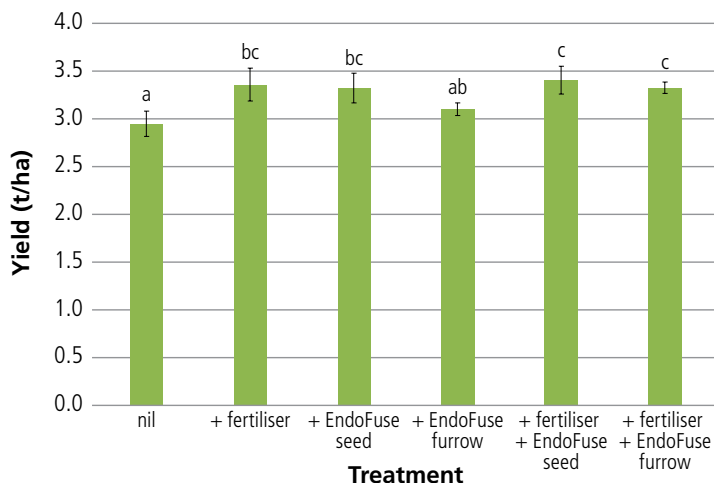
Tendo Mukasa Mugerwa, Peter Formann, Robyn Shapland NSW DPI, Tamworth.

A 2019 survey of wheat and barley paddocks across the Northern cropping region showed a large number of paddocks with below adequate AMF levels (Simpfendorfer et al. 2020). Of the 264 paddocks tested, only 4% had adequate soil AMF levels. Based on the survey results NSW DPI undertook a chickpea trial to ascertain the benefits of inoculating chickpeas with a commercial AMF inoculant (EndoFuse) in a typical low AMF situation.

Key findings

- Increasing soil arbuscular mycorrhizal fungi (AMF) levels increased the yield of chickpea by 13%.
- Sowing chickpea with starter fertiliser containing P increased yield by 14%.
- Increasing soil AMF levels can increase yield to levels comparable to those obtained when applying fertiliser.
- The application of starter fertiliser plus AMF inoculation did not have a cumulative yield in this trial.

Average chickpea grain yield at Tamworth, 2021



For +fertiliser treatments, 60 kg/ha Granulock®Z (Incitec Pivot Fertilisers) was banded below the seed (6.6 kg N/ha, 13.08 kg P/ha, 2.4 kg S/ha, 0.6 kg Zn/ha).

Treatments not requiring fertiliser were balanced for N and S using urea and gypsum respectively.

This experiment demonstrated that potential yield limitations can be overcome by increasing soil AMF levels. In this experiment, this was achieved through inoculation with EndoFuse. Whilst the addition of an extra 60kg of starter fertiliser produced statistically similar results the cost efficiencies and broader crop and soil health benefits associated with EndoFuse make it a valuable choice.

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