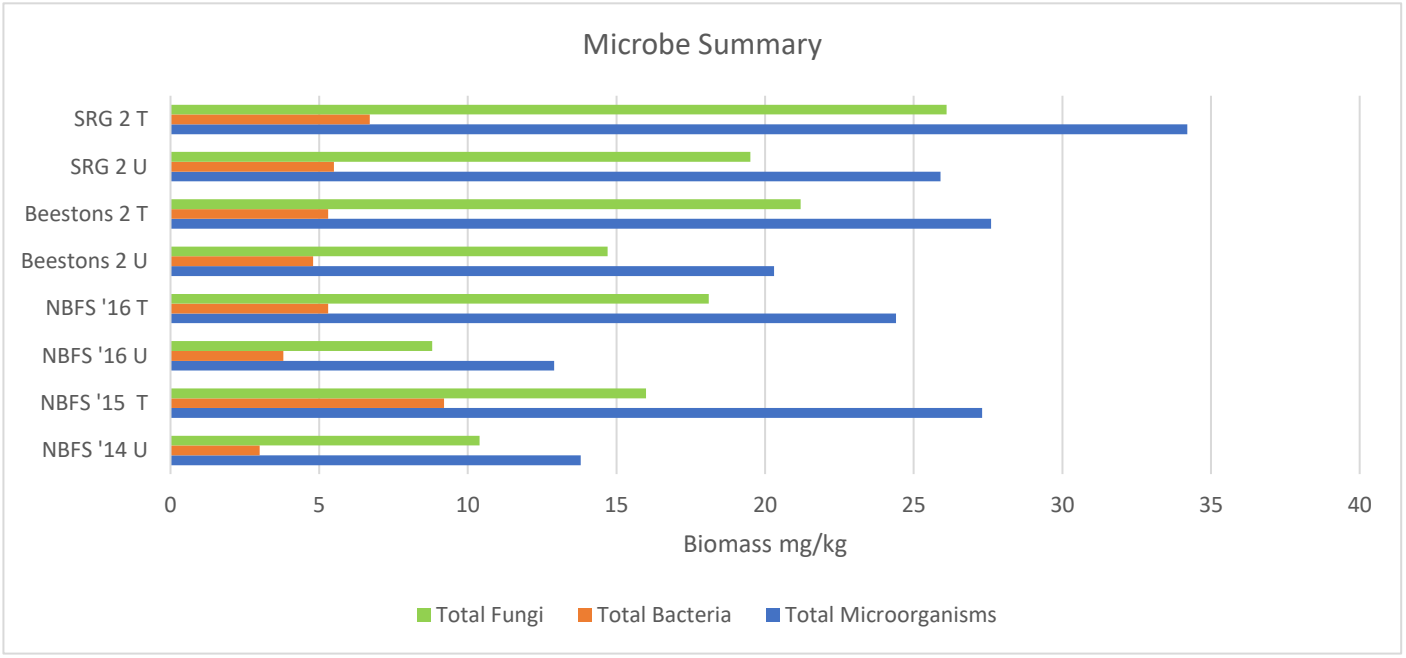
Boxford Fruit Farm – Microbial Trial Report

Results from the trial work at Boxford continue to impress with BioAg Soil and Seed consistently outperforming control treatments.

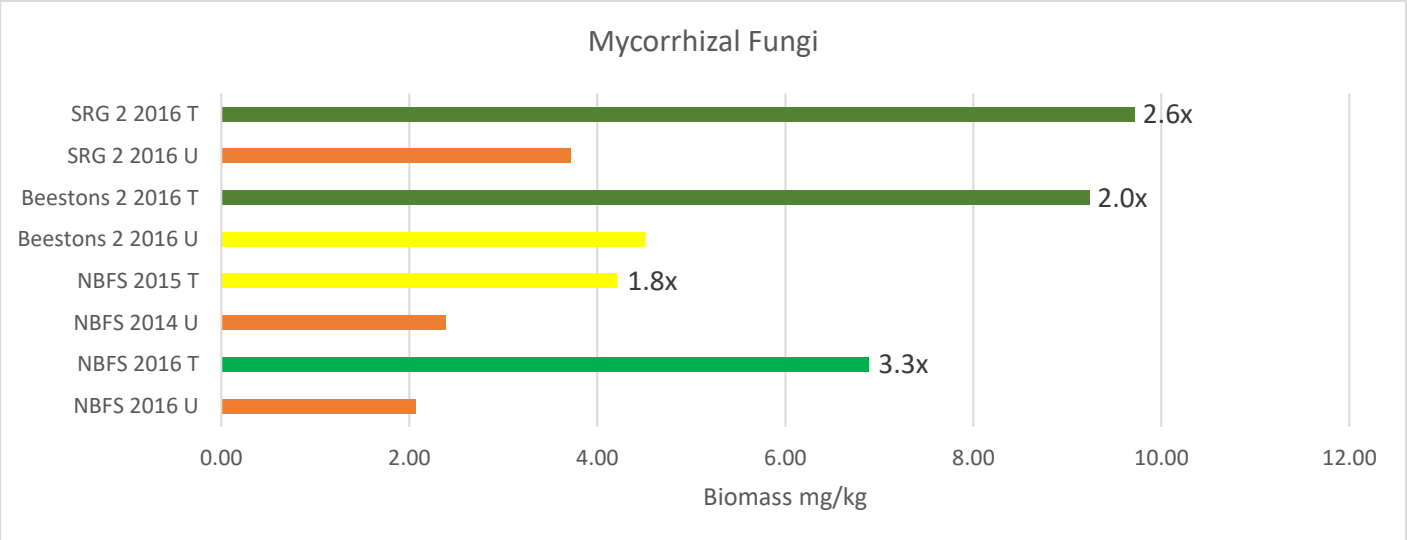
Soil & Seed provides the complex food supply for the micro-organisms in the soil to give them energy so that balanced and efficient nutrients are available to the plant (both roots and herbage). This food supply is a complex of vitamins, amino acids, hormones (natural), enzymes, proteins and special mineral compounds providing high levels of biochemical energy (by products of humus formation). The graph below shows results of the trial work with BioAg Soil & Seed. Treated results are indicated with a "T" meanwhile untreated plots are indicated with a "U".

Total microbial content has been consistently higher on the treated plots. Most this increase is due to the proliferation of fungal microbes as expected given the nature of the product, although there has been some increase in bacterial levels as well.

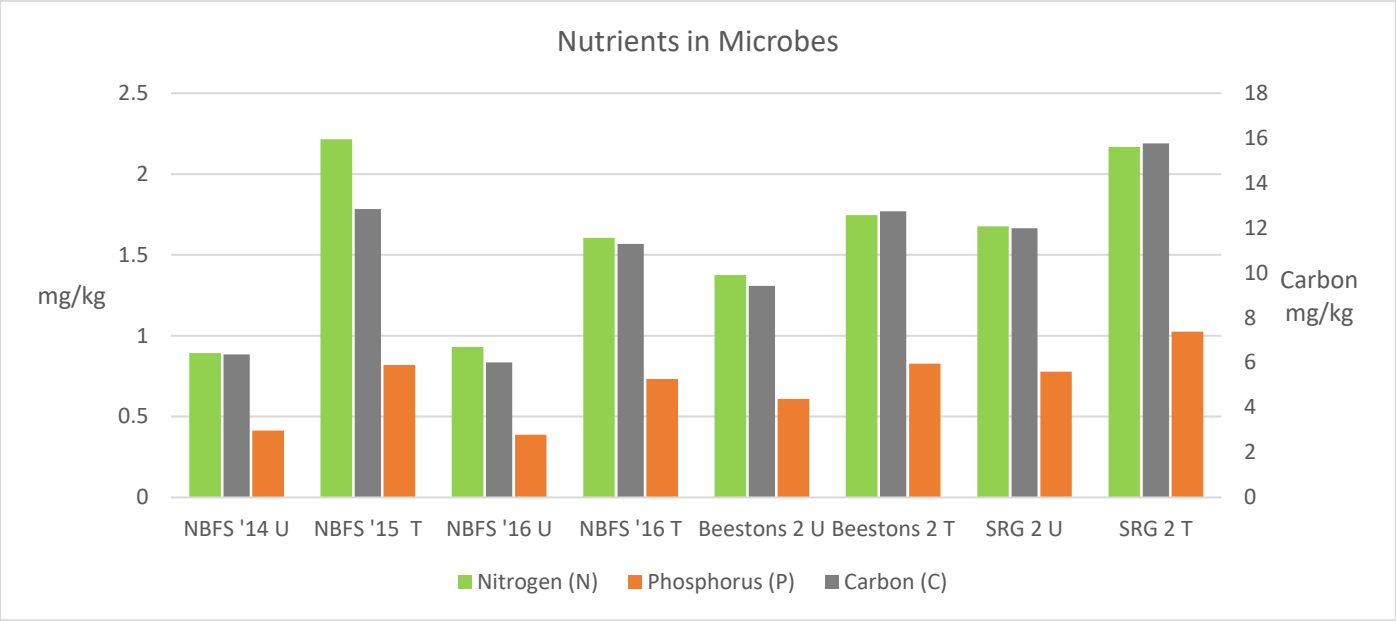


Out of the fungi found in soils it is the mycorrhizal fungi that are of particular interest for plant productivity. Mycorrhizal fungi enhance plant performance through the formation of mutualistic relationships with the roots of many plant species. The plant gains the benefits of the fungi mycelium's higher absorptive capacity for water and mineral nutrients and in return the fungi receive carbohydrates including glucose and sucrose that the plant produces through photosynthesis. The fungi's mycelium increased the plant roots absorptive capacity because of the fungal hyphae, which are both longer and finer than plant root hairs therefore having a greater surface area for absorption. Mycorrhizal fungi are also well known for their ability to fix atmospheric Nitrogen and to increase the release of Phosphorus from soil reserves.

The graph below displays the mycorrhizal fungi content of the soil samples we received. It is clear to see that soil that has received the Soil and Seed biological inoculant has a far greater mycorrhizal population (up to 3.3x) than the corresponding control plots. It is also clear that the benefit increases with multiple years of application (NBFS: 2015 1.8x, 2016 3.3x).



Due to the increased mycorrhizal fungi content, it is unsurprising that microbial nutrient levels are also performing well in the treated soils. In the graph below we can see that there have been significant increases in Nitrogen, Phosphorus and Carbon in the treated vs the untreated plots.



Below is a table summarising the analysed differences between the averages of all untreated and treated results. The key performance points of focus being the 80% or greater increase in the Mycorrhizal fungi, Calcium and Magnesium parameters. Although it is important to state that all parameters have increased by at least 39% with the majority over 50% higher in the treated soils.

	Control/Test	Guide	Mean Untreated	Mean Treated	Difference Treated vs Untreated	Increase vs Control
Total	Microorganisms	50.0	19.80	29.89	+10.09	+50.96%
	Bacteria	15.0	4.14	6.34	+2.20	+53.03%
	Fungi	33.8	14.77	22.30	+7.53	+50.97%
Bacteria	Pseudomonas	1.000	0.58	0.89	+0.32	+55.33%
	Actinomycetes	1.000	0.59	1.04	+0.45	+75.84%
	Gram Positive	4.000	1.90	2.65	+0.75	+39.60%
	Gram Negative	11.000	2.24	3.69	+1.45	+64.79%
Eukaryotes	Protozoa	1.300	0.90	1.24	+0.34	+37.43%
	Mycorrhizal Fungi	10.000	3.45	6.51	+3.07	+88.96%
Nutrients in Microbes	Nitrogen (N)	3.450	1.30	1.95	+0.66	+50.71%
	Phosphorus (P)	1.500	0.59	0.90	+0.30	+50.95%
	Potassium (K)	0.500	0.20	0.30	+0.10	+50.96%
	Sulphur (S)	0.500	0.20	0.30	+0.10	+50.96%
	Calcium (Ca)	0.250	0.14	0.26	+0.12	+81.73%
	Magnesium (Mg)	0.250	0.14	0.26	+0.12	+81.73%
	Carbon (C)	22.688	9.16	13.82	+4.66	+50.92%

The data from the past 3 years suggests that BioAg Soil & Seed is performing well, with analysis showing treated soils consistently outperforming untreated counterparts. Treated soils are providing plants with a greater beneficial microbial population, allowing for greater access to and absorption of essential nutrients and water. These factors benefit the plants within the treated plots and should increase future health and productive potential compared to those situated in the untreated counterparts.

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