



Kiwifruit soil | Trial Sheet

Mycorrcin, Foliacin and Digester



Three long term biostimulant trials were conducted in Bay of Plenty kiwifruit orchards: one a conversion of a G3 orchard to certified organic management and two were Hayward orchards. Use of the Biostart programme had visibly improved soil structure in all three orchards and increased the yield of Class I trays harvested.

To identify the relationship between these improvements to yield and quality in kiwifruit and the Biostart programme, soil samples were collected and then analysed by Soil FoodWeb NZ (www.soilfoodweb.co.nz). The samples were collected from the G3 orchard in autumn and from the Hayward orchards in winter.



Biostart-treated soil from a kiwifruit orchard



Untreated



Biostart-treated

Organic conversion block visual soil comparison

Method

Mycorrcin, Foliacin and Digester were applied regularly in these orchards: 3 years in the G3 orchard and 4 years in the Hayward orchards.

Mycorrcin – a soil biostimulant that activates beneficial soil microbes to make more nutrients available for plant growth and speeds up crop establishment. Three applications per year, at bud break, flowering and post-harvest.

Foliacin – a foliar biostimulant that improves leaf retention, photosynthesis levels and improves vine resilience. Five applications per year, starting at early shoot growth

Digester – a soil biostimulant that activates the soil microbes that breakdown organic matter from crop residues which recycles nutrients faster and improves soil structure. One application in late autumn/leaf fall.

Application rates and kiwifruit biological programme yield results available at biostart.co.nz/kiwifruit



Results

Soil Fungi

Long-term use of the Biostart biostimulant programme has greatly increased both soil fungal levels and activity. In all three orchards the Biostart biostimulant programme increased the level of both active (by 405–496%) and total (by 51–326%) fungi above that observed in the standard orchard soils (Figure 1). This four-to-five-fold increase in active fungi levels created by the Biostart programme is a desirable outcome for permanent horticultural crop soils. In autumn/winter fungal activity is critical for efficient recycling of organic matter from the previous season's growth (leaves, old roots and prunings) into humus, which improves soil structure, and releases/captures plant nutrients for next season's growth.

Soil Bacteria

In all three orchards the Biostart biostimulant programme increased the level of both total (by 6–70%) and active (by 58–116%) bacteria over that observed in the standard orchard soils (Figure 2).

The elevated levels of active bacteria in the Biostart-treated soils are a result from the higher fungal activity, which releases sugars from organic matter breakdown. Bacteria then utilise these sugars to grow and, as a result, provide nitrogen for fungal growth and activity. In spring, for example, soil bacteria are critical for providing soil nitrogen.

Endo-mycorrhizal fungi colonisation

The Biostart biostimulant programme increased the level of endo-mycorrhizal colonisation of kiwifruit roots in all three trials by 30–160% over the standard orchard samples (Figure 3). Endo-mycorrhizal fungi act like a secondary root system for plants, helping them absorb nutrients, improving root health and increasing plant resilience during droughts or flooding. Increasing levels of endo-mycorrhizal colonisation leads to improved plant nutrition.

Conclusion

These results identify the improvements in the soil biology that created the higher vine yields and quality measured in the Biostart treated orchards. Long-term use of the Biostart biostimulant programme in kiwifruit orchard soils led to significant enhancements in soil health and productivity. Notably, active soil fungi have increased by over four times, active soil bacteria by 60–120%, and mycorrhizal fungi colonisation of vine roots by 30–160%. These improvements enabled the Biostart-treated soils to recycle organic matter more efficiently, enhance plant nutrient availability, and boost nutrient uptake, ultimately leading to higher yields and more Class 1 fruit.

Figure 1. Active Fungi in Kiwifruit Orchard Soils

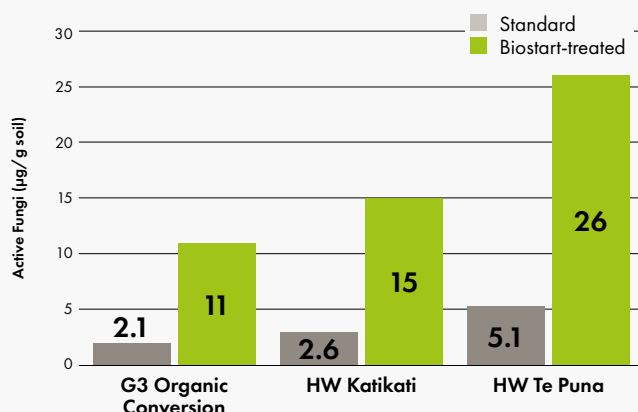


Figure 2. Active Bacteria in Kiwifruit Orchard Soils

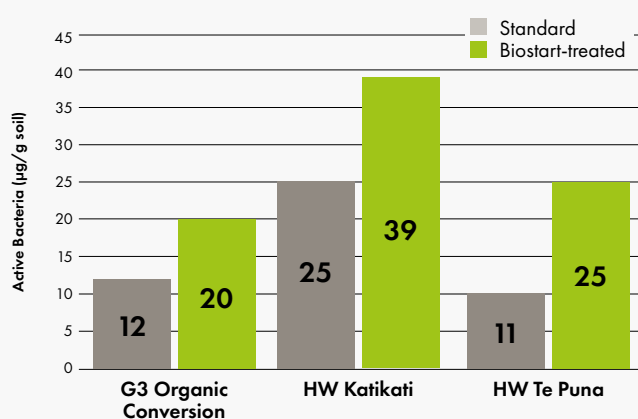


Figure 3. Endo-Mycorrhizal Fungi Colonisation in Kiwifruit Orchard Soils

