Kiwifruit | Benefits Sheet

Biostart Armillaria Programme

Background

Armillaria is a naturally occurring soil fungus that infects the roots of plants. In kiwifruit vines, Armillaria infection is a slow progressing disease that initially restricts production of the vine and eventually results in vine death.

Kiwifruit vine death due to Amilaria infection

There are three different Armillaria species found in New Zealand with *Armillaria novae-zelandiae* being the most important for kiwifruit. Armillaria infections spread from infected roots of other vines, dead tree stumps, or willow/pine hedges. New kiwifruit vines cannot be planted in same spot as the infected vine.

In healthy soils, disease-causing fungi and bacteria are suppressed by other soil microbes. A balanced soil biology enables kiwifruit to withstand disease pressure from Armillaria while an unbalance soil biology can allow the disease-causing microbes to prolificate.

Biostart Armillaria Programme

Terracin is used to reduce the Armillaria, followed by Mycorrcin, which rejuvenates any beneficial microbes that have also been reduced by Terracin. This results in a rebalanced soil microbial population that is resilient against Armillaria going forward.

Terracin contains *Bacillus amyloliquefaciens* Bs1b which works by disrupting the existing microbial population in the soil by producing antimicrobial compounds which suppress the Armillaria (and some other microbes).

Mycorrcin is a soil biostimulant that activates naturally occurring beneficial microbes present in your soil, including *mycorrhizal fungi*, which improve plant health, resilience and root development. Mycorrcin is used to restart the beneficial bacteria in the soil to recreate the balance found in healthy soil after Terracin has done its reset.

Root damage on a kiwifruit vine caused by Amilaria infection

Biostart Armillaria Programme Benefits

- Address soil imbalances to ensure healthy balanced soil biology
- Reduced Armillaria induced vine loss
- Higher yields
- Sturdier vines with bigger stronger root systems
- Better soil structure and aeration
- Improved canopy health

Reduced Vine Death Rate

Trials in five Armillaria infected kiwifruit orchards over 3 years showed that the Biostart Kiwifruit Programme reduced Armillaria vine deaths by 88%. Over the three year trial 5.6% of the untreated vines had died whereas only 0.7% of the Terracin-treated vines had died. This equates to a significant reduction in death rate from 2 vines/100 vines/year down to one vine/100 vines every 4 years.

A kiwifruit vine beginning to die from Amilaria infection

Terracin programme improved canopy health

In April trial vines were assessed using a scoring system that measured the impact of the disease on canopy health. At this time of the year vines are under maximum physiological stress due to the crop load as the vines approach harvest.

Figure 1. Change in Canopy Disease Score

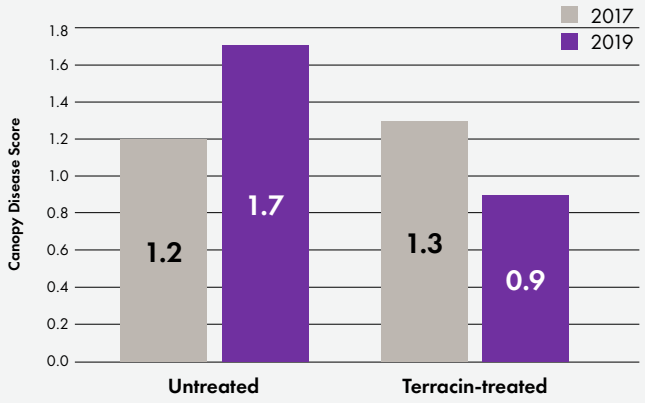

Figure 1 shows that vine canopy disease scores were similar at the end of year one of the trial but that at the end of year three the disease score had reduced by 32% for the Terracin-treated vines but increased 34% for the untreated vines. This showed that the Armillaria disease impact was worsening in the untreated vines, while Terracin-treated vines were improving and being less affected by Armillaria.

Conclusion

Application of the Biostart Terracin and Mycorrcin programme over three years in kiwifruit orchards was an effective way of reducing vine death from Armillaria and the impact of the disease on canopy health.