



Cherry Soil Health Fact Sheet

Key Points

- The **alternative nutrient management regime** uses organic amendments and effective microbes as an alternative to conventional synthetic fertilisers and herbicides.
- **Fruit cracking** was reduced each season in plots treated with **effective microbes** with 37% less cracking in a high rainfall season. In years 3 and 4, there was also less fruit cracking in the **alternative nutrient regime** plots.
- **Fruit set** was higher for the alternative nutrient management plots with a small decrease in **fruit size** (1-2 mm) for Sweetheart and Staccato
- In the alternative regime fruit quality met **Australian 'export finest' standards**.

The Cherry Soil Health Project is a 5 year project with the goal of improving soil health through an alternative nutrient management regime. Soil health has many definitions but ultimately means the soil should be fit for purpose, in this case growing cherries, whilst sustaining soil biodiversity and the soil ecosystem. At the same time a healthy soil maintains or enhances water and air quality. It's a complex system that is difficult to meaningfully measure.

This project looks at how different management practices affect indicators of soil health and how these impact on longer term cherry tree productivity and fruit quality.

Alternative or conventional?

Alternative farming systems use organic based fertilisers such as manures, composts, humates and bio-fertilisers as an alternative to conventional systems that rely on synthetic fertilisers and herbicides. There has been a growing interest in alternate farming systems as a way of reducing environmental impact and enhancing soil health. However it is uncertain whether fruit quality in alternate systems can be maintained and whether these amendments increase soil biology and provide sufficient nutrients.

Our test orchards

The project has 2 trial sites: Hansen Orchards in the Derwent Valley, established in November 2012 on cultivars Sweetheart and Staccato; and Huon Park Orchards at Nicholls Rivulet, established in March 2013 on Lapins.

The alternative system

The alternative regime is a dynamic program that we modified each season based on annual soil test results. The aim was to rebalance available soil minerals and promote soil biology. Fertiliser amendment included **regular applications of bio-humates** blended with **targeted minerals**. The mineral component was made up according to levels of total and available minerals indicated by soil tests. Weeds were mown as an alternative to herbicide application.

Effective microbes (EM)

We also examined a commercial mix of effective micro-organisms (EM). EM is a mixture of beneficial microorganisms, predominantly lactic acid bacteria and yeasts purported to have beneficial effects on soil and plant growth.



Figure 1: Applying effective microbes in the cherry orchard

The test products

Organic amendments

- *Ferbon™* (lignite-based soil conditioner, Interstate Energy Group) applied at 300 kg/ha in years 1 & 2.
- *Humified compost* (Foundation Aerobic Compost, Pure Living Soils) at 800 kg/ha combined with soluble humate granules (Nutri-Tech Solutions) at 20 kg/ha from year 3 onwards.

The organic amendments were applied in spring and autumn. Targeted minerals were blended with the ferbon or compost and included potassium, manganese, zinc, copper and boron.

Microbial amendment - Effective microbes (EM) Soil EM amendment (EM1, VRM Pty Ltd) was applied monthly at the recommended rate (15 L activated EM/ha) throughout the experiment, from October 2012 to February 2017.

Impact on cherry fruit quality

- **Cultivar:** Lapins was more responsive to the alternative management regime and effective microbe application than Sweetheart or Staccato. However, this may be due to site factors and soil type with Lapins grown only at Huon Park Orchards, Nicholls Rivulet.
- **Fruit set:** The alternative regime resulted in a higher fruit set compared to fruit set in conventionally managed trees in most years.
- **Fruit size:** Sweetheart and Staccato fruit diameter was 1-2mm smaller in the alternative regime in most years.
- **A-grade fruit:** There was a general trend for more A-grade fruit from the alternative regime.
- **Fruit Cracking:** There was significantly less fruit cracking from the alternative regime in years 3 and 4. EM application reduced the incidence of cracking in every season. The 2016/17 season was notable for high levels of fruit cracking due to rain leading up to harvest. In this season greater than 50% of fruit from the conventionally managed trees cracked whilst there was only 18.5% cracking from alternatively managed trees.

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Dr Sally Bound

Tasmanian Institute of Agriculture
Sally.bound@utas.edu.au

Tel: +61 3 6226 2958