

Avocado Industry

Biomin Boron

ISSUE 15

Top of the Line Products Increasing Fruit Set and Yield for your Bottom Line Dollars.

Importance of Balanced Nutrition

Balanced nutrition plays a major role, if not the biggest role in the production of quality produce. The aim of the grower should always be to optimize fertilizer practices and never cut costs by cutting out on fertilizers.

Improper nutrition can impact on other issues within an orchard such as keeping quality, disease and pest levels, which at the end of the day may work out far more expensive than properly timed applications of quality fertilizers that are systemic and have no residues.

Grower Trial

Aim: - A trial was conducted in the Bay of Plenty to test the effects of different boron products and application techniques on avocado trees.

Control:

The current Industry practice is to: -

- 1) Apply regular applications of solubor boron to the soil under the trees (solubor, Granubor)
- 2) Apply a foliar spray of a weak boron solution to the trees while flowering. This is repeated three times between September and November.

Trial One

The first part of the trial was using Biomin Boron as a foliar

Biomin Boron is a Glycine chelated Boron where the boron atom is attached (Chelated) to an Amino acid called Glycine forming a compound. Glycine is actively transported into the leaves carrying the Boron with it like a Trojan horse.

Trial Two

The second arm of the trial is to inject a boron solution directly into the trunk of the tree to ascertain affects on boron leaf levels and yield. Injecting avocado trees is an established practice used for controlling root rot (Phytophthora)

Method

23 trees were selected that were in two rows, these trees are the same age and have had the same treatments over the last five years.

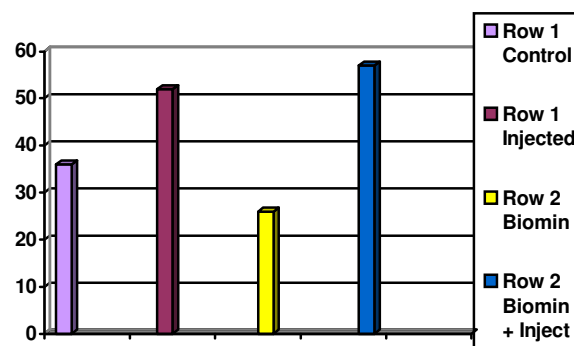
Row one is the control block that was sprayed with three solubor boron applications as outlined under control

Row two was the first experiment block which was sprayed with Biomin Boron three times during flowering

In addition to this alternate trees were treated with four injectors each containing 20 mls of boron solution in October 2001.

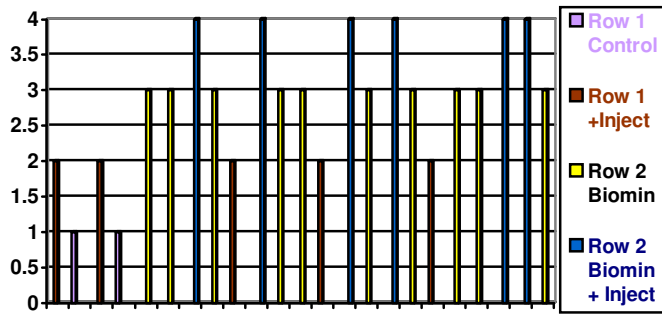
Alternate trees in row one were injected with Solubor boron solution, alternate trees in row 2 were injected with Biomin Boron solution.

Leaf Boron Levels



On the 25th February leaf analysis of Boron levels were sent for assessment through RJ Hill Laboratories as shown in graph above.

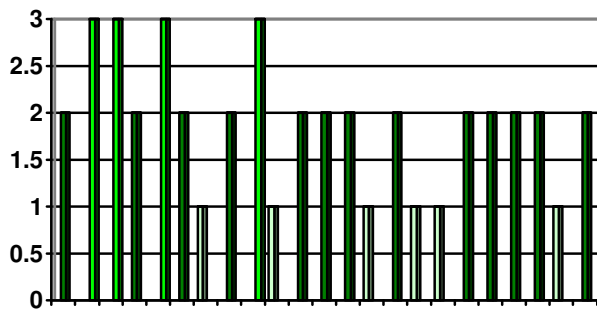
Crop Load



Trees in experiment group

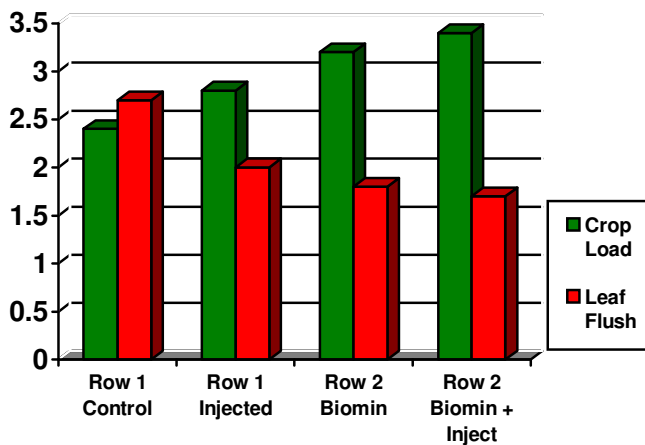
A survey of crop load and leaf flush measured on a continuum basis are outlined in the two graphs above and below. Leaf flush measured how vigorously the trees are growing. Usually a tree with a poor crop will grow with excessive vigor, however some leaf growth is required to ensure flowering next season.

Leaf Flush



Trees in experiment group

Means of Crop Load and Leaf flush



Trees in averaged Groups

Results

It was clearly demonstrated from the results that the Biomin Boron rows produced more crop with less leaf flush.

The control group, (row one) with Solubor boron as a foliar had the lowest crop load and the highest leaf flushes.

(Row two) Biomin Boron plus injection had the lowest leaf flush and the heaviest crop load. The Biomin Boron injected trees also had the highest Boron leaf levels at 57, which was one of the highest Boron levels ever attained on that orchard. The difference in crop load between the highest and lowest was estimated based on bins at approximately 4 tonne / ha .

Discussion

It was interesting to note that row two, Biomin Boron foliar had the lowest leaf boron levels however had significant yield increase.

Biomins are Glycine chelated nutrients that are bio-available within a plants system i.e. They are systemic.

Boron is required in large amounts by the avocado flower ovaries. Since Biomins are systemic the boron is translocated within the tree to the flower and excess boron above the tree requirement is stored within the leaf.

This is demonstrated in row two Biomin boron plus injection, where the yield was significantly increased as well as leaf levels.

It is also interesting to note that Biomin are wax soluble. Biomin have a molecular weight of around only 200, which means they are easily able to pass straight through the waxy leaf and fruit at any stage of growth and do not require the plant stomates to be open for absorption. No contamination of elemental leaf analysis is present as may be found through the use of other products, which may leave residue sitting on leaf

Conclusion

The use of Biomin boron has shown significant yield increase on avocado with the lowest leaf flush levels. It has also been shown that injected boron makes a difference to measurable boron levels and avocado productivity. The sustainable use of Boron injection may come into question however the use of Biomin Boron could significantly increase production of avocados for many growers in New Zealand.