



**BIOMIN™ CALCIUM
TRIAL
DMS ORCHARDS 2008-2009**

Efficacy of Biomin™ Calcium on Kiwifruit Quality Assessments and Storage Life
Compared to 'Standard Practices'

THREE TIERS ORCHARD

*Preliminary Report
July 2009*

CALCIUM

Calcium is an important constituent of the cell walls and membranes of plants.

When calcium is in short supply, cell membranes become leaky, and cell division is disrupted causing abnormalities in the growing points and root tips, as well as the fruit. Calcium appears important in protecting the cells from toxins, in slowing the aging process of plant tissues and in promoting longer storage life and resistance to tissue breakdown in many fruits, as well as promoting pest and disease resistance.

Most physiological disorders in plants have been attributed to the lack of Calcium. Such disorders can be in either the fruiting parts of the plant or the vegetative parts of the plant.

During critical stages of growth, the supply of Calcium to growing points, young leaves, root tips and developing fruit is limited.

Many Calcium related disorders are the result of Calcium movement patterns within a plant.

Conditions which stress the plant such as drought, very hot weather, drying winds, and soil lock-up of Calcium or factors which encourage rapid growth such as heavy pruning and / or excess Nitrogen can all reduce Calcium movement into the fruit.

WHAT IS BIOMIN CALCIUM

BioMin Calcium carries worldwide patents; developed by JH Biotech Inc. leaders in research and development of nutraceuticals and biological organisms. BioMin Calcium is a fully chelated mineral utilizing Glycine in the chelation process. Glycine is the smallest amino acid, and can permeate both the fruit and leaves of plants due to its very small molecular weight and it is not reliant on stomata opening.

THREE TIERS ORCHARD

Biomin Calcium has been trialed in many industries including kiwifruit with excellent results. Results to date show that Biomin Calcium has impacted positively on fruit Calcium levels, colour, dry matter, and disease incidence.

OBJECTIVE

This season 2009, Biomin Calcium will be further assessed for fruit quality parameters in terms of yield, size, TZG, dry matter, taste payments as well as ongoing fruit storage assessments showing the dollar for dollar return from the use of Biomin Calcium.

METHOD

Three Tiers Orchard was selected as one of the eight orchards by DMS to be utilized in this trial. This orchard had been under performing.

The orchard was ideal with a control block and treatment block side by side both at the same altitude.

Biomin Calcium was applied to the Green Treatment area with Control One being Pink block at same altitude whilst blocks Blue and White were further utilized as controls to assess quality parameter comparisons on the blocks sprayed with Biomin Calcium.

The previous year, 2008 results for all blocks including the Green block are also shown.

Biomin Calcium was air blasted over the treatment area at a rate of 3.3kg / Ha x 3 applications with 2 L/ Ha Mobilizer (Fulvic acid) during the cell division period immediately after flower on the 3rd Dec 2008, 11th Dec and 17th Dec.

RESULTS

The results for this orchard were outstanding. This block has never in the history of the orchard gained a Y band yet the Biomin Calcium treated area did gain a Y Band whilst all other control areas remained as M band fruit.

Levels on the Biomin Calcium treatment block recorded the highest Dry Matter.

The Zespri Taste grade was the highest along with yield per Ha.

Fruit size remained reasonable at 34.33 being the second highest size bracket from the orchard whilst carrying significantly higher yield in a year where fruit size has been smaller across the industry as a whole.

ECONOMICS

These are significant results.

With an initial expenditure for the Biomin Calcium of around \$500.00 Ha , increased yield, higher dry matter and improved taste band grade have effectively gained the grower extra profit as outlined below

Extra Trays per Ha produced	833.8
Zespri Average for trays	\$3.42
Amount	\$2848.86
Dry Matter published average per tray	\$1.10
Amount	\$917.18
Sub Total	\$3768.78
Zespri Loyalty 15 Cents per tray	\$125.07
Total	\$3893.85

With this block achieving a higher dry matter level & Y taste band whilst all other control blocks did not, the above profit is a conservative representation of extra profit earned. Since the total trays per Ha on the treated block (12,295) earned the extra TZG level of \$1.10 this alone comes to \$13,524.50 extra profit

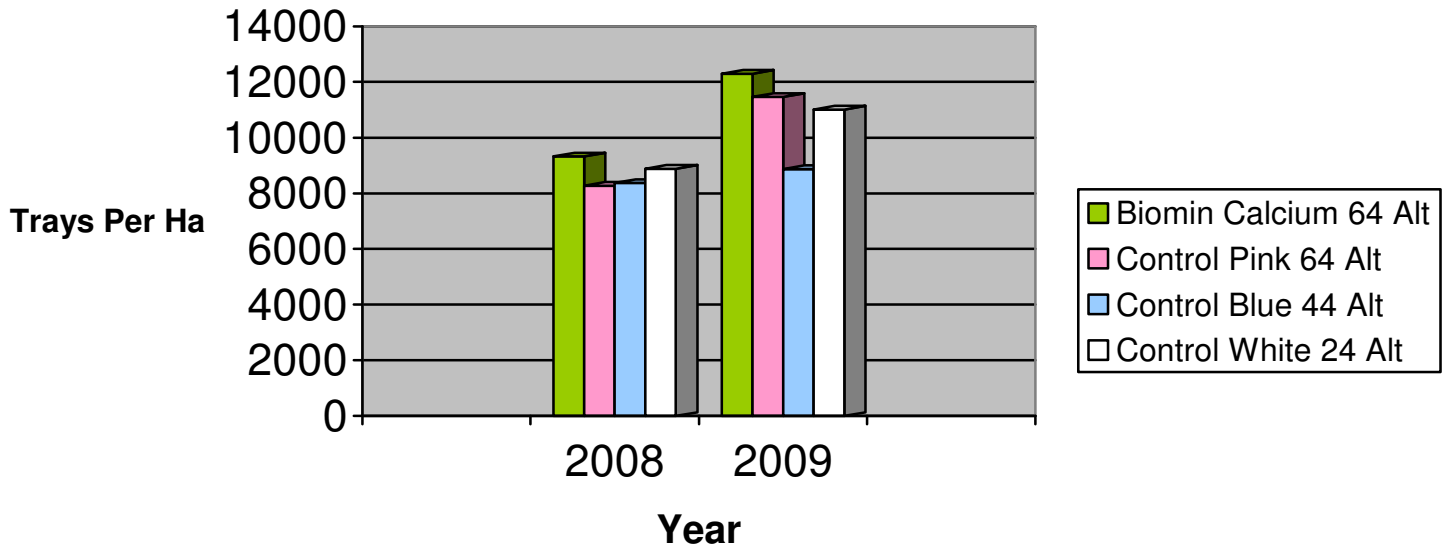
Table 1

RESULTS	Colour	Dry Matter	Taste Zespri Grade	Taste Band	Yield Per Ha	Fruit Size
2008	Control Green Alt 64	15.57	0.28	M	9323.85	29.77
2009	Biomin Calcium Alt 64	16.62	0.55	Y	12295.41	34.33
2008	Control Pink Alt 64	15.41	0.2	M	8275.76	31.17
2009	Control Pink Alt 64	16.14	0.35	M	11461.62	35.23
2008	Control Blue Alt 44	15.70	0.29	M	8373.39	30.15
2009	Control Blue Alt 44	16.31	0.39	M	8870.64	33.41
2008	Control White Alt 24	15.29	0.22	M	8887.18	32.80
2009	Control White Alt 24	15.98	0.32	M	11006.41	37.05

Graph 1

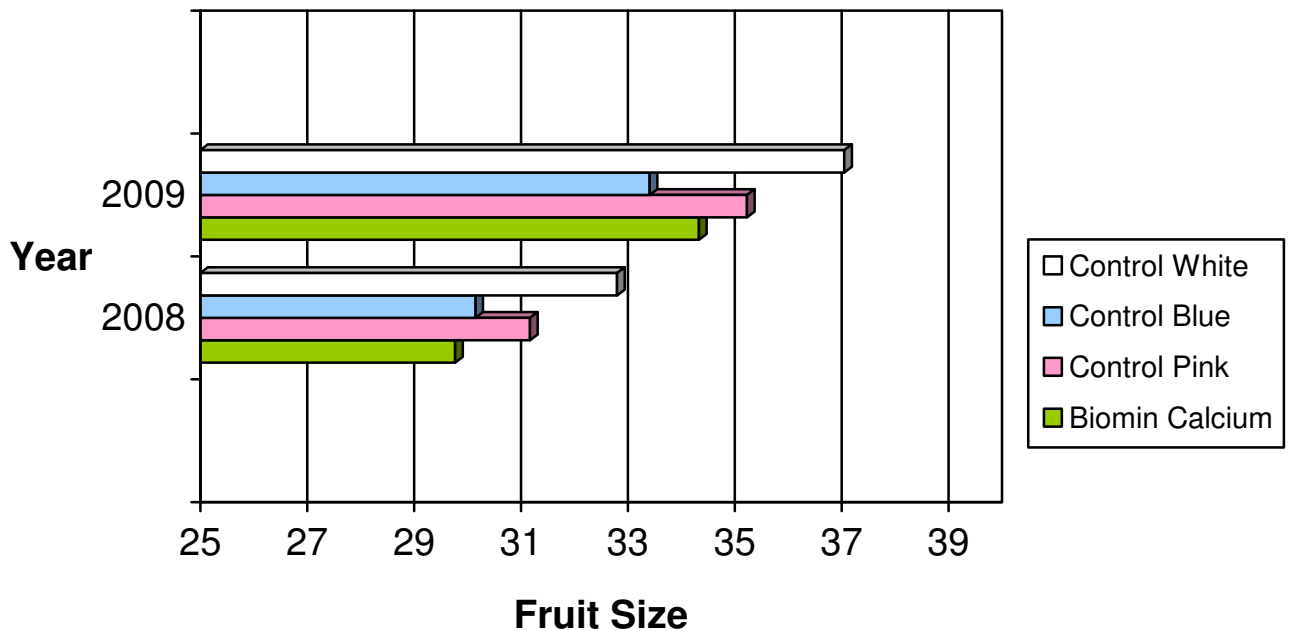
***NB: Please note that NO BIOMIN CALCIUM was applied in 2008. Data for 2008 is displayed for comparative purposes to show the blocks history in relation to 2009 when Biomin Calcium was applied shown in Green

Biomin Calcium Yield Data



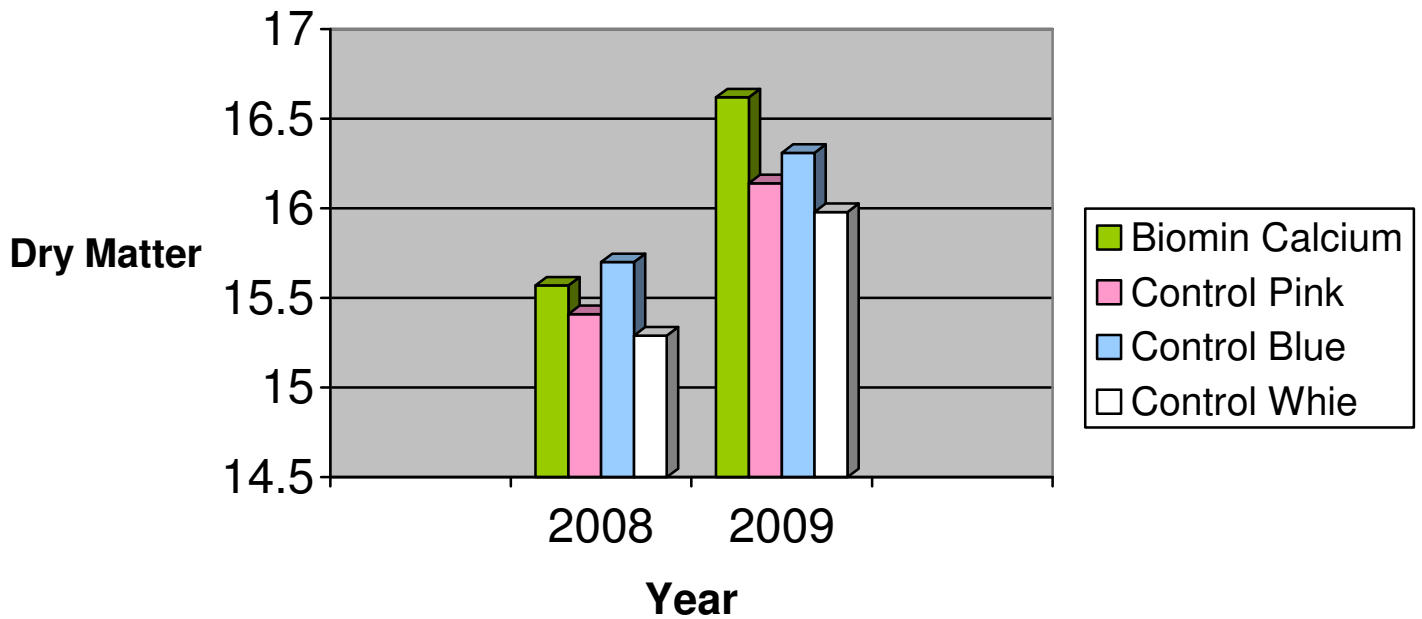
Graph 2

Fruit Size Comparison



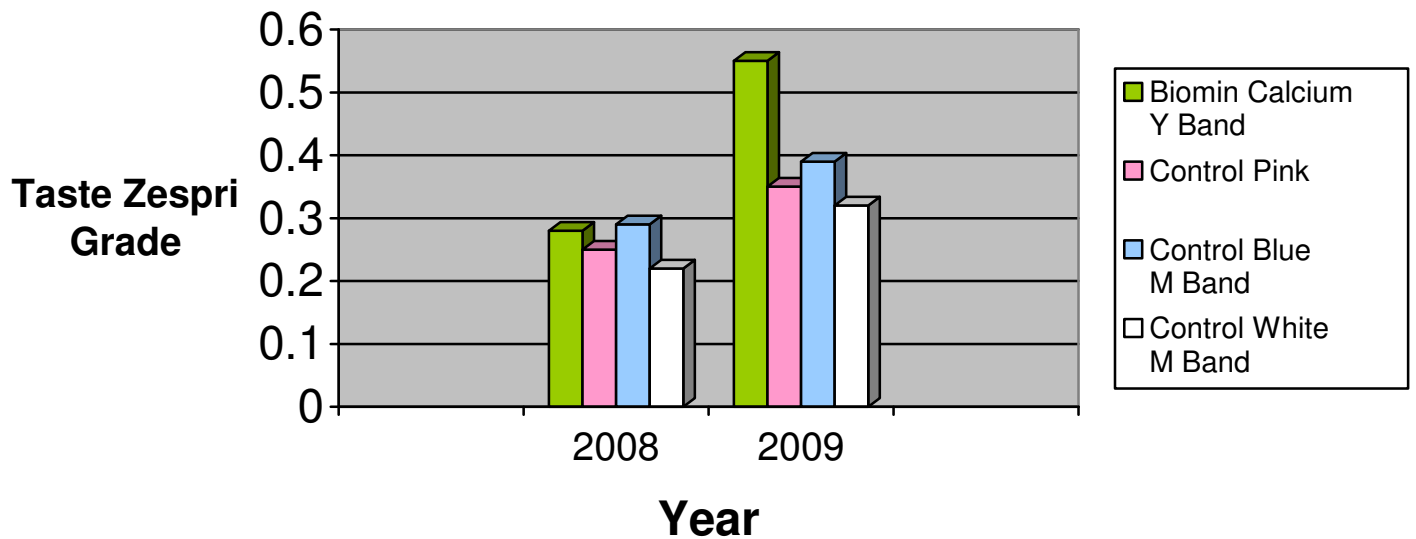
Graph

Biomim Calcium Dry Matter Results



Graph 4

Taste Zespri Grade & Taste Band Biomim Calcium Y BAND



CONCLUSIONS

Biomin Calcium is considered by many to be an expensive product, and when compared to other products on the market, kilo for Kilo Biomin Calcium is more expensive.

The trial has shown however that purchasing decisions should not be made on the basis of price alone but consumer confidence should be evaluated on the quality, formulation, and efficacy to validate the choice. A cheap product which does not deliver on expectations is actually an expensive product.

The advantages of the use of a quality Calcium would impact positively on other aspects such as keeping quality (Still to be assessed), fruit hue colour and vine health.