

FOCUS VINEYARD INTERIM SOIL TRIAL RESULTS

PLEASE NOTE THAT THESE ARE INTERIM RESULTS. FURTHER STATISTICAL ANALYSIS OF THE DATA IS STILL REQUIRED

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OBJECTIVES

Increasingly, growers are becoming aware of the importance of maintaining soil health by adapting to more sustainable methods of production. In addition to changes in management, there are a number of products/treatments promoted and in some cases widely used, that specifically aim to address aspects relating to soil health related issues. In some cases they are based on assumptions that have not been tested in vineyard environment yet, and the effect of treatments on vines and crops has not been investigated to any great depth.

The scope of these trials does not extend to include testing theories brought forward lately relating to soil biomass fractions and the ratios between them, or to examine the exact mechanisms by which mycorrhizal fungi may improve berry quality. However the results will hopefully shed at least some light on some of these issues.

The trials will investigate the effect that some treatments/products commonly used to promote more sustainable soil use, have on soils and vines, and on wine quality.

The following trial objectives have been identified:

Within the budgetary constraints it was decided to lay down a new trial in one Hawkes Bay vineyard (Prospect Vineyard) and to combine forces in relation to an existing trial on the Gimblett gravels (Villa Maria). The Villa Maria trial has been started in 2003, and revolves around the efficacy of using of less soluble phosphorus fertiliser inputs to reduce leaching losses, and improving vine phosphorus uptake by promoting mycorrhizal fungi.

TREATMENTS

The choice of treatments is based on treatments presently available and commonly used and promoted in the New Zealand viticultural landscape. These include the use of (semi) raw organic/biological inputs like composts and compost tea, as well as a number of more processed commercial inputs (bio stimulants, commercial soil inoculants and seaweeds).

There is a range of commercial (processed) products on the market. For practical reasons we cannot test a whole range of products. It is likely that there are considerable differences between different seaweed products.

For these reasons we have limited the treatments to only two commercial products, one is already widely used in vineyards to promote mycorrhizal colonisation of grapevine roots (Mycorrcin). The other one is a Humic Acid based product commonly used in Hawkes Bay (Humax).

The use of soluble fertiliser at high rates may affect soil microbial communities and result in negative environmental effects. There is an increasing trend to use less soluble fertiliser like Rock Phosphate, which it is claimed is more compatible with the promotion of mycorrhizal fungi.

One treatment is based on a suspension fertiliser application Rock phosphate and elemental sulphur.

TRIAL SETUP

The applied treatments are

PROSPECT VINEYARD

- 1 Control
- 2 Bark based compost
- 3 Bark based compost + compost tea
- 4 Compost tea
- 5 Mycorrcin
- 6 Humax
- 7 Sulphur (sulphur prills)

VILLA MARIA TWYFORD GRAVELS (shared)

- 1 Control
- 2 Suspension fertiliser (RPR and elemental S)
- 3 Repeat suspension fertiliser
- 4 Fertigation NPK
- 5 Fertigation NPK + Mycorrcin
- 6 Fertigation NPK (3/4 rate) + Mycorrcin

Compost tea, Mycorrcin and Humax are based on multiple applications/year.

Compost tea is supplied by Abron and applied as per specifications.

Suspension fertiliser will be applied using the special equipment developed for this purpose.

Mycorrcin and Humax can be applied through spray applications. Mycorrcin will be applied through fertigation in the Villa Maria fertigation part of that trial.

The Prospect trial is based on 5 replicates per treatment (two bays per replicate). The Villa Maria site is limited to three replicates/treatment due to technical fertigation system constraints and because this is a continuation of an existing trial.

INTERIM RESULTS

The full effects of these treatments cannot be expected in this first season. Although there may be some early results, the dynamics of vine physiology and nutrient uptake mean that one has to wait for at least the second vintage for some of these (potential) effects to start coming through. This is further accentuated by the late starting date for this trial, which meant that the applications on the Prospect site were made later in spring than desirable.

Prospect Vineyard Interim results

Petiole and blade samples were collected at flowering and veraison. The results showed:

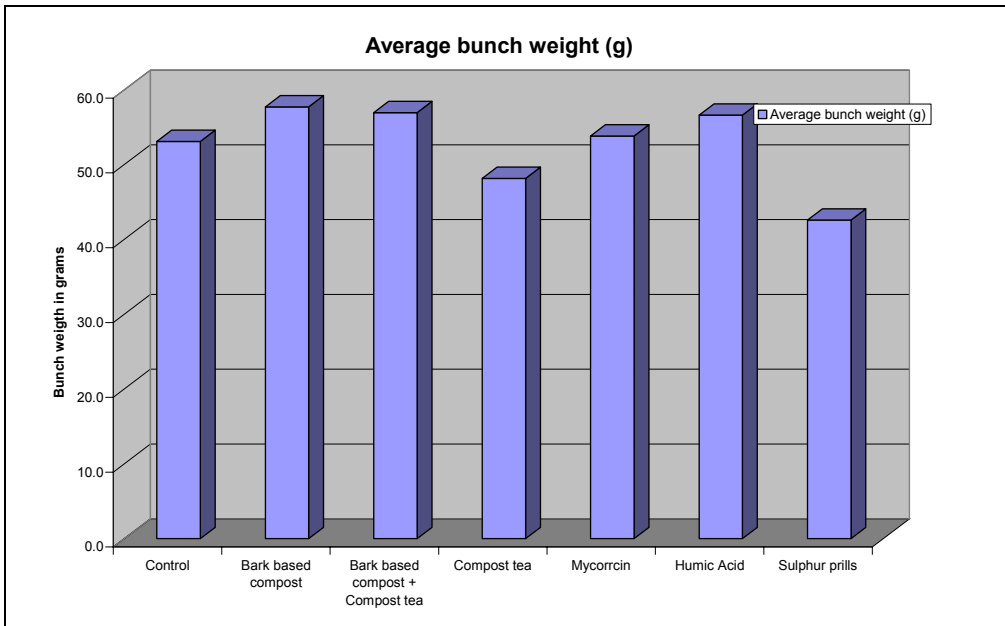
- a slight increase in tissue potassium levels at veraison for the bark compost treatment
- The bark compost may also have had a positive effect on phosphorus uptake.
- Increased calcium levels for the Mycorrcin treatment.
- Slightly lower nitrate-N levels from the Humax, Mycorrcin and Sulphur prills treatments

TABLE 1 – Petiole and blade analyses (flowering)

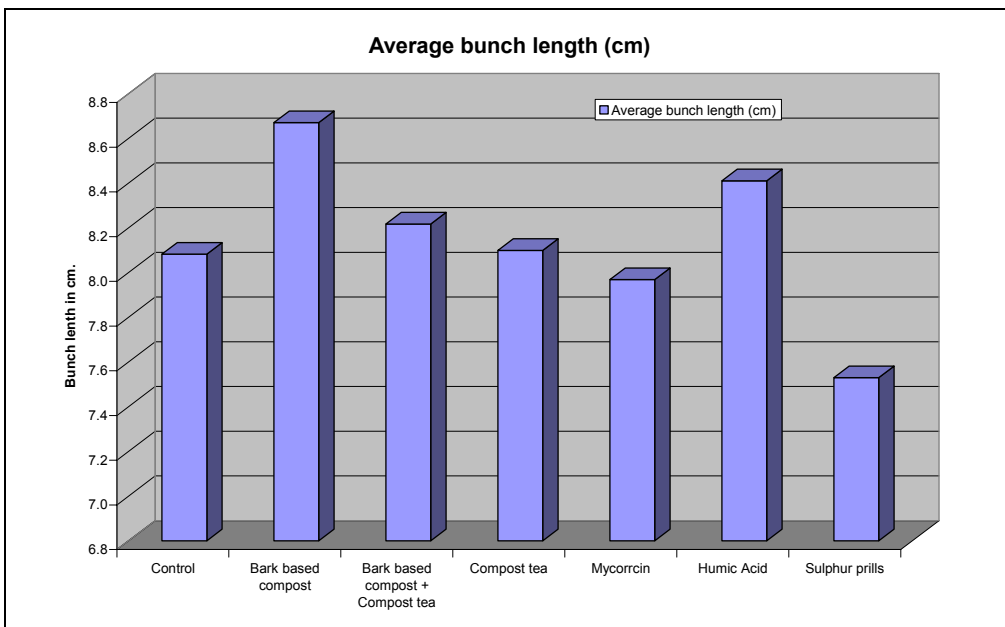
Petiole and blade at veraison	1 Control	2 Bark Compost	3 Bark Compost & Tea	4 Tea	5 Mycorrcin	6 Humic Acid	7 Sulphur Prills
Nitrogen	2.7	2.9	2.8	2.9	2.9	2.6	2.9
Nitrate-N (Petiole)	632	735	584	511	387	362	441
Phosphorus	0.17	0.19	0.19	0.18	0.18	0.17	0.18
Phosphorus (Petiole)	0.14	0.19	0.15	0.14	0.18	0.14	0.17
Potassium	1.1	1.2	1.1	1.1	1.1	1.1	1.1
Potassium (Petiole)	3.5	4.1	3.7	3.5	3.4	3.2	3.5
Sulphur	0.24	0.25	0.25	0.24	0.24	0.24	0.24
Calcium	2.14	2.18	2.23	2.2	2.32	2.2	2.14
Magnesium	0.25	0.24	0.27	0.24	0.26	0.26	0.23
Magnesium (Petiole)	0.29	0.23	0.26	0.3	0.3	0.29	0.27
Sodium	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron	67	74	71	68	67	67	68
Manganese	84	90	100	83	96	96	80
Zinc	18	19	21	18	21	20	20
Copper	4	5	7	5	6	5	5
Boron	27	26	29	24	24	25	25

At harvest, sub samples bunches were collected from each replicate, and bunch weights, bunch length, berry weight and berry number/bunch were measured. In addition a Botrytis assessment was made, and some juice parameters were determined.

It appears there may have been an effect on bunch weights and bunch length in the bark based treatments (upwards) and in the Sulphur Prills treatment (downwards) as is shown in the following graphs (graph 1 and 2)

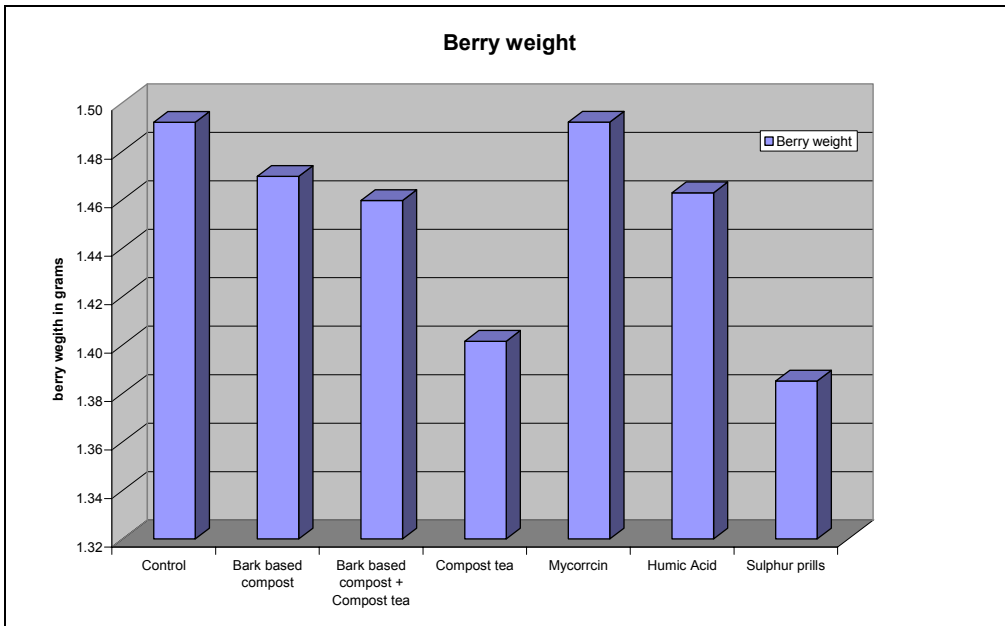


Graph 1 – Prospect 2006 average bunch weights



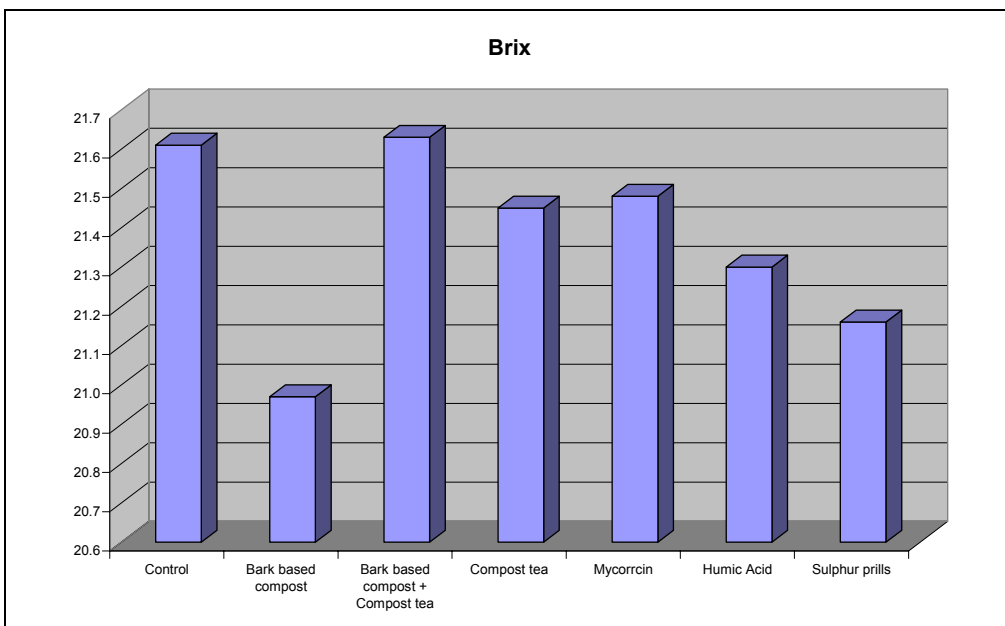
Graph 2 – Prospect 2006 average bunch length

Berry weights (shown in the graph 3) varied considerably per treatment:



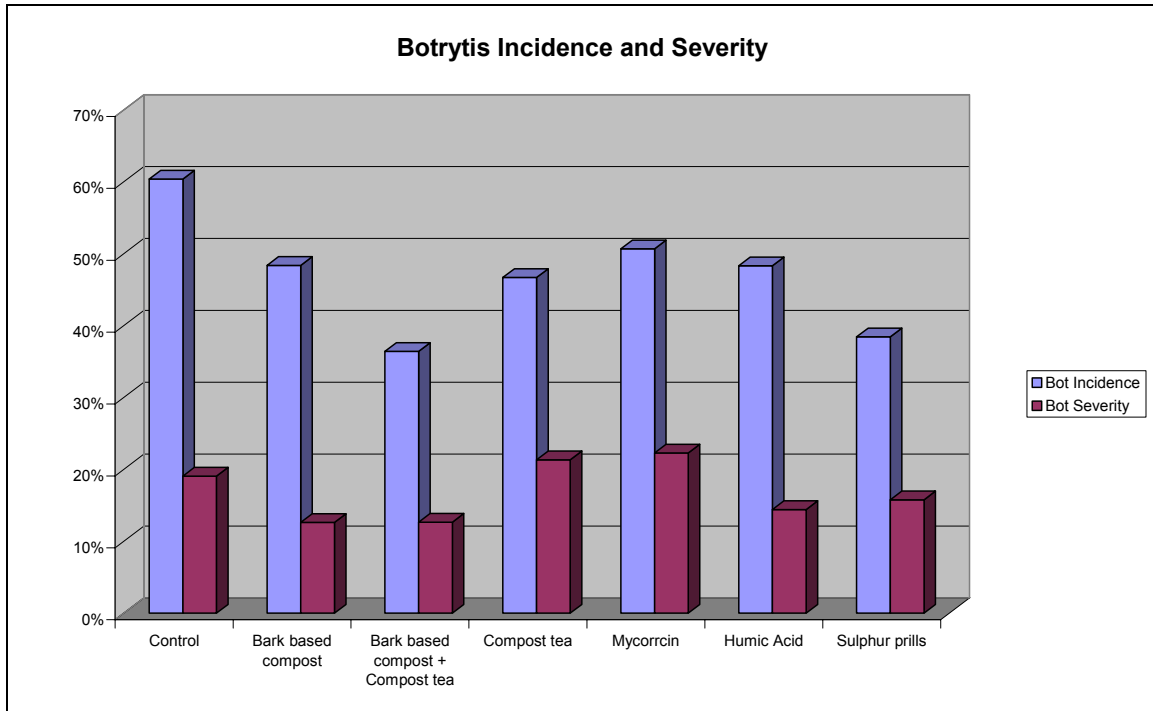
Graph 3 – Prospect 2006 average berry weights

Brix results also showed some interesting trends, with the bark Compost treatments apparently resulting in lower Brix levels. In contrast, the combination of Bark Compost and Compost Tea showed the highest Brix levels. The Bark Compost treated vines showed the highest yield of all treatments (which would explain the lower Brix), however more analysis is required to confirm the significance of this.



Graph 4 – Prospect 20065 – Brix levels

Botrytis assessments were made on the bunches 36 hrs after they were harvested. This is likely to have increased both incidence and severity compared with the field Botrytis status.



Graph 5 - Prospect 2006 Botrytis -36 hrs after harvesting bunches

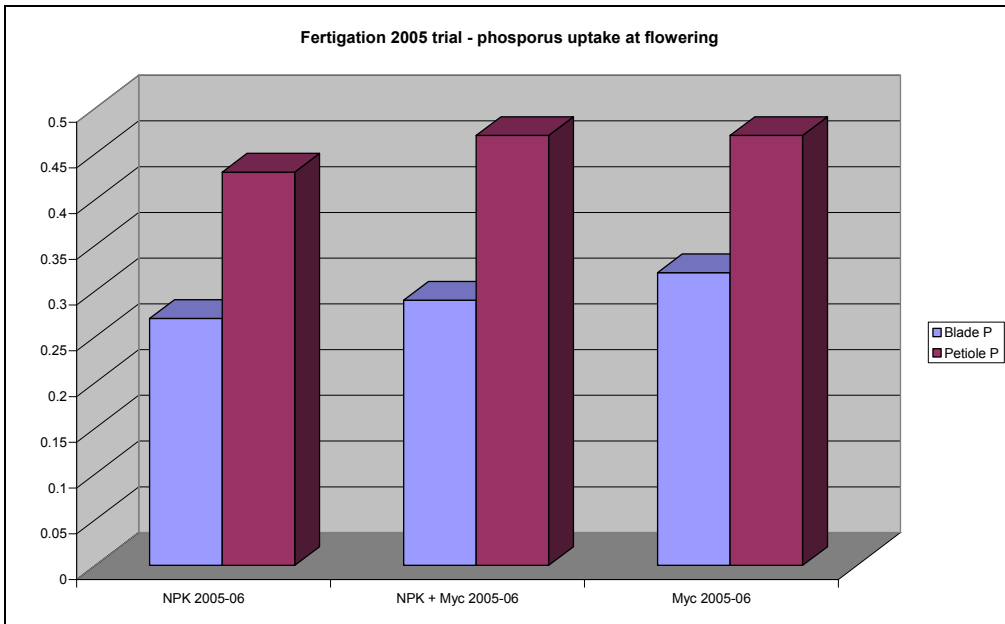
VILLA MARIA Trial interim results

The Villa Maria trial consists out of three different trials. One trial (not replicated) started in 2003. A three time replicated trial where suspension RPR and granular RPR were applied and where a bio stimulant was applied as well, and the third part which started in 2005 and is a 3 replicate fertigation trial. This latter trial is based on three treatments:

- NPK fertigation program as normal.
- NPK fertigation program at 75% with half the label rate of a bio stimulant.
- Fertigation with the bio stimulant only.

The bio stimulant was aimed at increasing mycorrhizal colonisation to aid vine phosphorus uptake.

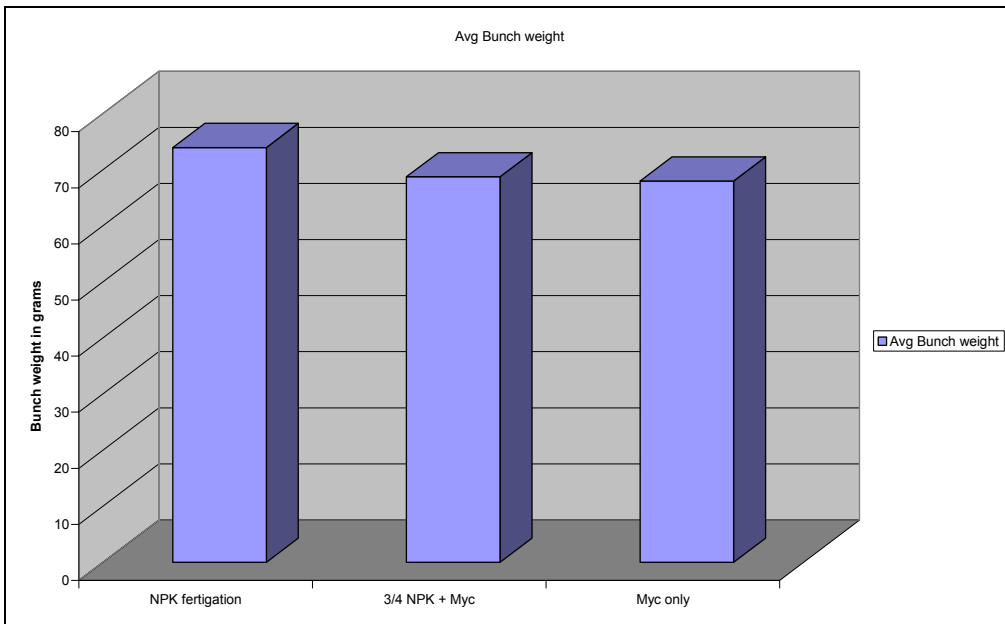
The phosphorus tissue results at flowering showed an increase in P uptake despite less P being applied:



Graph 6 – VM 2006 Petiole and Blade P levels

The test at veraison showed slightly higher P levels at the combines treatment but the bio stimulant only treatment had dropped back to just below the levels of the standard NPK treatment (No Phosphorus had been applied there at all).

The yield monitoring did not show much difference in quality parameters, but yield was slightly down in the bio stimulant treatments; this was mostly due to lower bunch weights. This is perhaps not surprising, as this site is very stony, and obviously requires regular nutrient inputs.



Graph 7 - VM 2006 Average bunch weights of fertigation trial treatments

The bio stimulant treatment may have decreased Botrytis incidence and severity (not shown).

The older part of the Villa Maria trial was in its second year. Rock phosphate was applied by suspension fertiliser and the same bio stimulant was used in this trial.

There were no significant differences in harvest and juice (2006) parameters (Brix, TA, pH). A number of these Villa Maria treatments will be microvinified.

Microvinifications from the 2005 harvest suggested some positive effects on wine quality in a blind tasting. Further laboratory analyses also suggested effects on wine quality parameters. This will be followed up again with the 2006 vintage for which a number of treatments have again been microvinified.