

Improved wine quality with the application of biostimulant Mycorrcin

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Key words

Grapes, Mycorrcin, wine quality.

Overview

In 2003 a trial site was established on patches 302-306 which had previously been Riesling which was grafted onto Chardonnay in 1991-93. The site which represents approximately 16.82ha was divided into 5 replicates for a total of 10 subplots. The treatments (Control versus Mycorrcin) were assigned randomly.

On October 20 2004 10L/ha of Mycorrcin was applied via a herbicide unit and sprayed to cover the entire row.

On October 25 trunk circumferences were measured on randomly selected vines. On each subplot 20 vines were selected (5 vines from 4 rows) and measured using a tape measure and measuring at the height of the drip line.

In November petiole tests were undertaken (at flowering) on all replicates and sent away to Hardy's standard laboratory for testing. Results are expressed as a % for the elements of Nitrogen (N), Phosphorous (P), Potassium (K), Sulphur (S), Sodium (Na), Calcium (Ca), Magnesium (Mg) and Chloride (Cl). For the remaining elements Copper (Cu), Zinc(Zn), Manganese(Mn), Iron (Fe), Nitrate (NO₃) and Boron(B) these are expressed in mg/kg.

Light Incidence was conducted just prior to harvest to determine light penetration into the canopy (1/3/05). Using a ceptometer and selecting twenty random vines per sub-plot a PAR reading was collected for each vine and then averaged. This is then expressed as a percentage of ambient light which is recorded with every PAR recorded. Leaf Area Index (LAI) is also recorded at the same time.

Maturity results were collected on two dates (23/2 and 2/3) which consisted on 40 bunch samples. These were measured for Brix, pH, TA, and Malic Acid. Bunch weights were also collected.

Harvest occurred on 5th and 6th of March with tonnes per hectare being calculated to determine yield.

Two wines were made from the combination of the sub-plots and tasting analysis performed in August.

Results.

Trunk Circumference

The Mycorrcin and control treatments reported a trunk circumference of 54.5 and 53mm respectively. Figure 1 indicates that this difference is not significantly different.

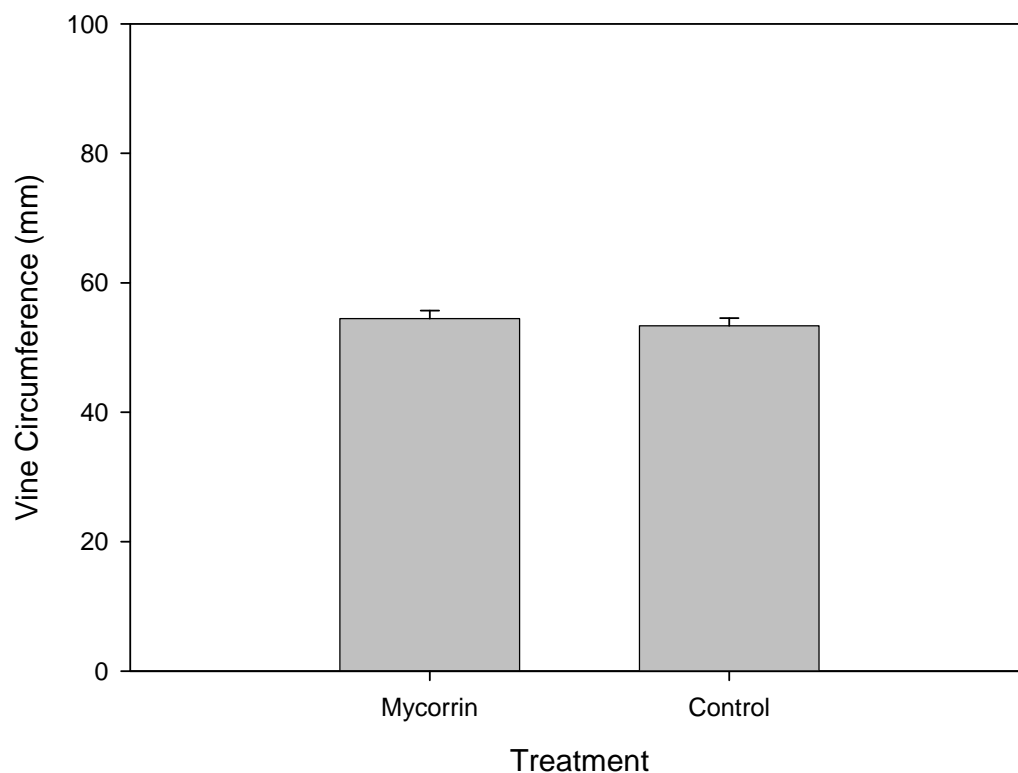


Figure 1. Effect of Mycorrcin application on trunk circumference.

Petiole Analysis

The elemental components as represented in Figure 2 and 3 indicate the control vines had higher amounts of N, P, K and NO₃ when compared against the Mycorrcin treatment. Ca, Cl and Zn levels all were higher in the Mycorrcin treatment with the Calcium results showing the greatest differences (1.07 and 1.28% respectively).

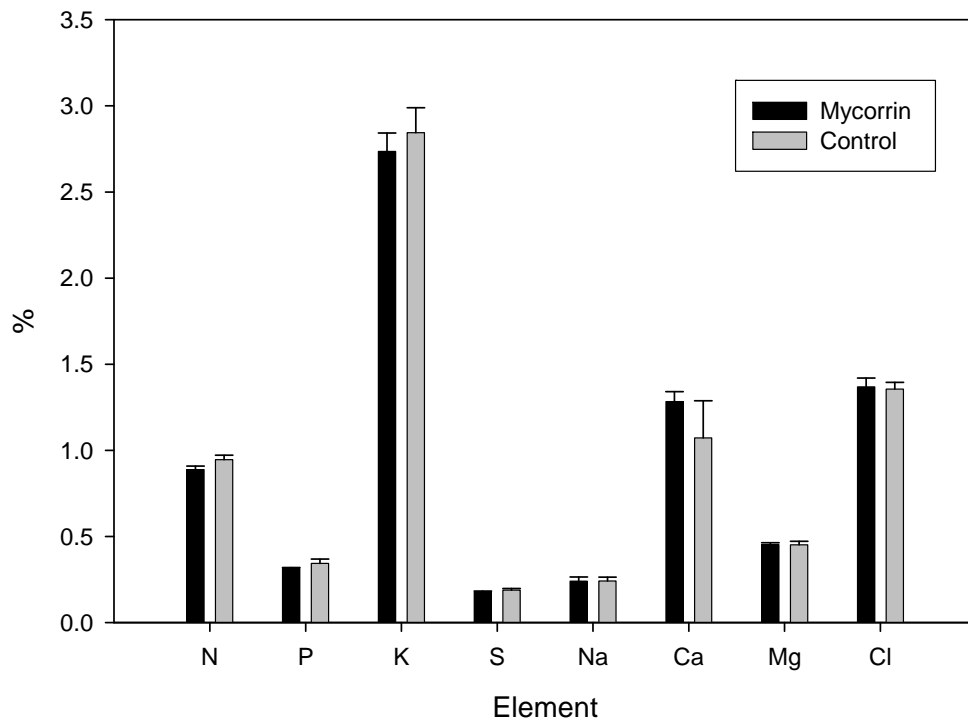


Figure 2. Effect of Mycorrhin application on petiole nutrient elements of Nitrogen (N), Phosphorous (P), Potassium (K), Sulphur (S), Sodium (Na), Calcium(Ca), Magnesium (Mg) and Chloride (Cl).

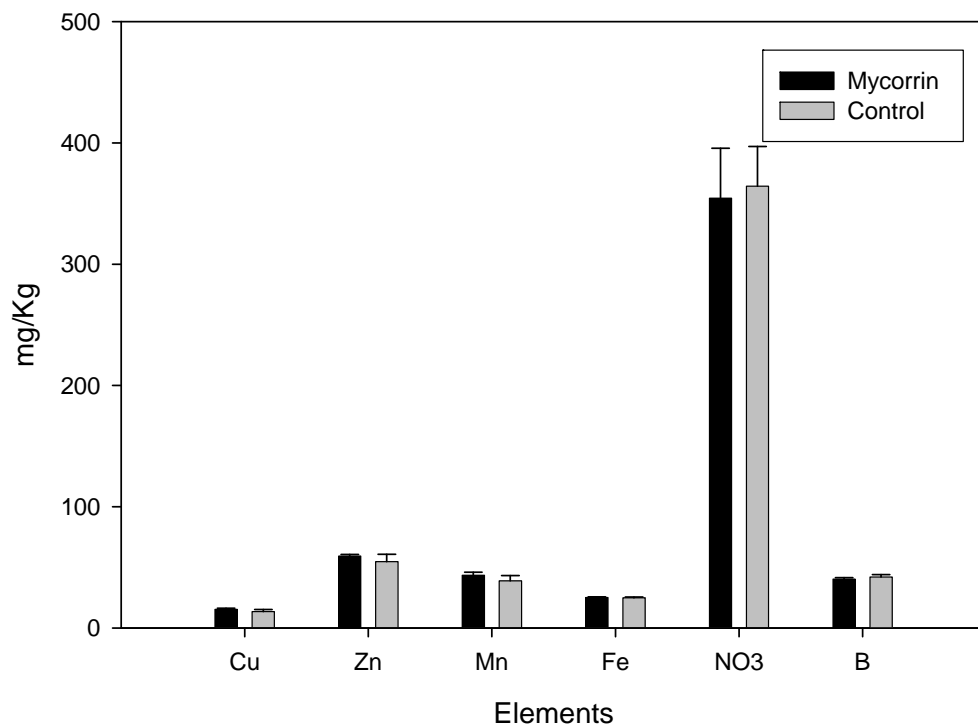


Figure 3. Effect of Mycorrhin application on petiole nutrient elements of Copper (Cu), Zinc (Zn), Manganese (Mn), Iron (Fe), Nitrate (NO₃) and Boron (B).

Light Incidence

Figure 4 indicates a greater amount of light being intercepted within the canopy in the control treatment (14% versus 12.9%). This difference is not significant. The Leaf Area Index reflects this trend with a greater leaf area in the Mycorrcin treatment. The greater leaf area of the Mycorrcin treatment (4.18 vs 3.72) is significantly different from the control.

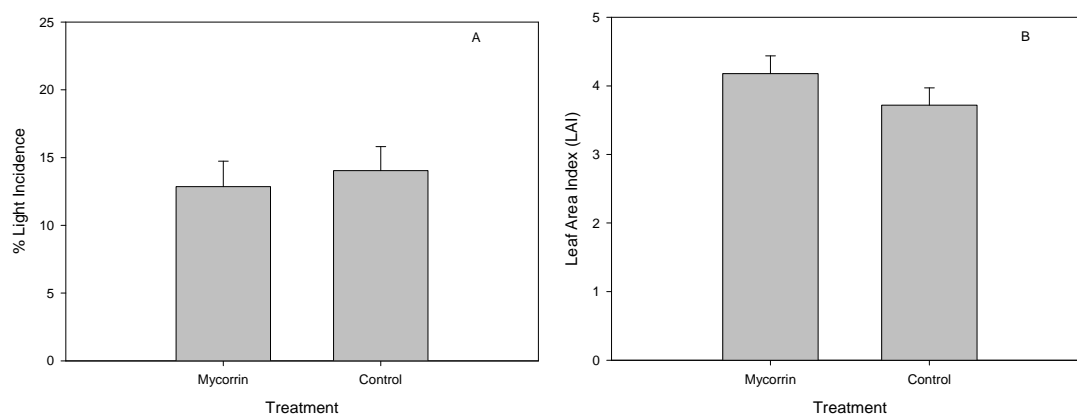


Figure 4. Effect of Mycorrcin on Light Incidence (Graph A) and Leaf Area Index (Graph B).

Grape Maturity Samples

Baume levels on both sampling dates as indicated in Table 1 do not show significant differences between the Mycorrcin and Control treatments. There is a 0.2° Baume difference just prior to harvest. There was no difference at all between the pH levels which did not alter from either sampling date. The TA trends suggest a lower reading at both sampling dates for the Mycorrcin treatment but once again not significantly so. Bunch weights on the first week of sampling were lower in the Control treatment (86.6 vs 90.2g) but a week later it was the Mycorrcin with the higher result (92.8 vs 93.4g). Malic Acid was only recorded in the final weeks sample with no significant difference between treatments.

Table 1. Effect of Mycorrcin on Baume, pH, TA, Bunch Weight and Malic Acid.

Sampling Date	Treatment	Baume	pH	TA	Bunch Wt	Malic Acid
23/02/2005	Control	12.8	3.1	11.1	86.6	-
	Mycorrcin	12.8	3.1	10.8	90.2	-
3/03/2005	Control	13.7	3.1	9.5	93.4	3.7
	Mycorrcin	13.9	3.1	9.3	92.8	3.8

Yield

Figure 5 indicates a higher yield in the Mycorrcin treatment (4.41T/ha) when compared against the Control (4.17T/ha) although not significant.

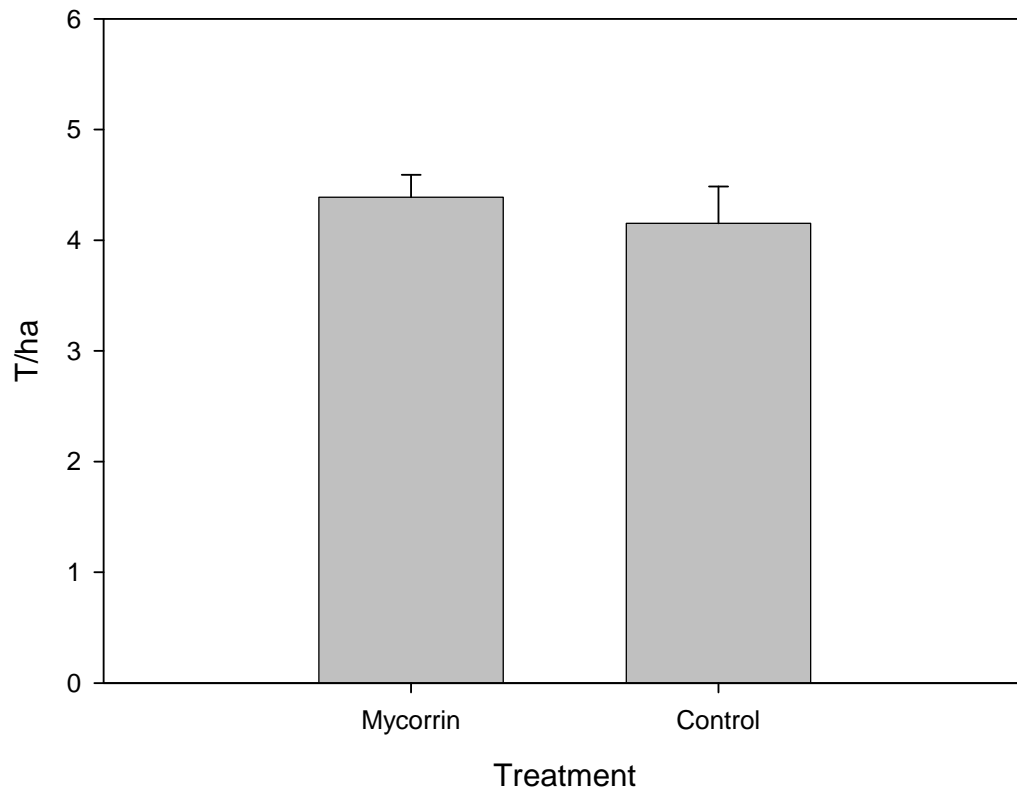


Figure 5. Effect of Mycorrcin on Yield.

Wine Summary

Juice parameters indicated a lower baume in the Mycorrcin treatment, and lower Malic acid levels as well as lower chloride levels when compared against the control. The control produced lower YAN levels. There was very little difference between the pH and TA values.

Wine values reported very little difference between the two treatments except for the chloride and copper levels which were lower in the control treatment.

As only two wines were made from the trial a ranking was given as to the most preferred. Wines were tasted blind. Of the 5 winemakers three preferred the Mycorrcin treatments with the remaining two nominating the control as the preferred wine. Thus the results are inconclusive. Comments from the winemakers are detailed in Table 2.

Table 2. Winemaker preference and wine description of control and Mycorrcin treatments.

Winemaker	Preference	Wine Description Mycorrcin	Wine Description Control
1	Control	Slightly dirty, slightly phenolic	Fuller on palate, palate creamier, smells sweeter with peaches, lemon citrus on palate
2	Mycorrcin	Tropical, slightly herbal, more intense, flinty	Less fruity, hotter, flinty
3	Mycorrcin	Clean crisp nose, grassy, some tropical flavours, creamy	Not as clean, less grassy, nose a bit closed, almost yeasty
4	Mycorrcin	Slightly H2S, full, slightly creamy	Sharper, thinner palate, greener and leaner
5	Control	Tropical/menthol, oily palate, tropical	Less tropical, oil, menthol

Table 3. Effect of Mycorrcin on juice parameters on fruit prior to winemaking

	Baume	pH	TA (g/L)	YAN(mg/L)	Malic (g/L)	Cl(mg/L)
Mycorrcin	12.4 (13.9)	3.34 (3.12)	5.9 (9.3)	251	3.6	318
Control	12.7 (13.74)	3.32 (3.114)	5.9 (9.5)	234	3.8	357

(between bracket the earlier info – GB)

Table 4. Effect of Mycorrcin on wine parameters

	Alcohol(%)	R.S.(g/L)	pH	Cu(mg/L)	Cl(mg/L)	NaCl(mg/L)
Mycorrcin	13.9	1.9	3.32	0.53	275	454
Control	13.8	1.7	3.43	0.38	254	419

2005/6 Season

This trial is to be repeated again this season, with the early spray already being applied according to the recommendations from Biostart. It is intended to undertake a Mycorrizal population count in September.

It is the recommendation of Biostart that Mycorrcin is applied via the dripper lines rather than a ground spray. This was not possible in the current trial site due to the replication issue making it impossible to inject the Mycorrcin accurately.

As a result we have set aside patches 206 and 208 Chardonnay to inject patch 206 with Mycorrcin and leave patch 208 as the control. Although not replicated it should give us an idea as to how effective the injection of the Mycorrcin is.

Possibly why we are not seeing the results from the original trial site is that only one application of the Mycorrcin is occurring during the season. Also at the time of application last year (October), Padthaway received less than average rainfall and above average temperature. It is well known that Mycorrcin is benefited by moist conditions.