

PRE PLANTING TREATMENTS TO AID TREE ESTABLISHMENT VAMINOC MYCORRHIZA and RIDOMIL PLUS DIPS NACM 2k/5.1

Summary

The objective of this trial was to overcome any residual SARD effects following replanting a site, and to increase resistance to crown rot.

The tree performance during the drought period shortly after planting, indicated that the pre-planting treatments were a great help in initial rooting and establishment. Since the treated trees continued to grow and crop better than the control trees, it would seem that the VA mycorrhiza treatments with or without a pre-planting dip, have also helped to overcome the inherent replant problem on this site. There were no symptoms of crown rot root problems in any of the trial trees.

The VA treatments, especially the combination treatment, also strengthened and increased flower bud production, leading to a significant increase in early cropping. After an initial growth check in the first year, shoot extension and trunk growth was normal, in spite of a heavier crop of fruit. This is a further indication that the treatments improved root establishment and possibly nutrient uptake.

Trial site and design

Bulmers, Lower Newton Farm, Replant Block [ex Major block]

Site treated with Round-up mid February 2000 before powerharrowing and ploughing to 20 cm.

Trees, variety Katy on MM 111 stocks, with rather dry roots, planted by machine 17.3.00 into good, fairly dry soil conditions. Weather warm but getting colder.

Trial design: Two single rows each containing 18 replicates of treated trees, in sets of 3. Several control rows in between, planted 16.3.00, after full rate Ridomil Plus dip.

Planting treatments

- 1] Incorporation of 10g VA mycorrhiza [Vaminoc] to planting hole.
[trees banded green]
- 2] Pre-planting dip Ridomil Plus at half rate [500g – 80l water], then incorporation of 10g VA mycorrhiza [Vaminoc] to planting hole. [trees banded green/yellow]
- 3] All control trees and rest of site; pre-planting dip in Ridomil Plus at full rate [1kg – 80l water].

Results

First year establishment [2000]

Treated trees survived an initial period of drought stress shortly after planting, better than control trees. Leaves showed less severe stress symptoms, cupping and scorch.

No signs of crown rot were noted.

Results are summarised in Table 1.

By the end of the first growing season, VA treated trees are noticeably more spurred, showing plenty of potential flower bud. Trees treated with VA alone are noticeably shorter than Ridomil dipped trees and controls, and lateral shoots and branches are more compact. Control trees are quite whippy, with more bare wood.

Tree girths at 30cm above the union, and total leader shoot extension growth, were measured during the dormant season. Girths of all VA treated trees are bigger than Ridomil dipped control trees, but their total leader shoot growth was significantly less.

2nd year establishment [2001]

Results are summarised in Table 2.

All trees on the site are healthy and growing away well. Trunk girths on the treated trees, measured 25 cm above the union, were significantly bigger, a 6% increase on average. There was also less variation between individual tree trunk growth than last season. Larger trunks indicate a better root system and hence a more rapid overall establishment.

There were no significant differences in the number of extension shoots longer than 10 cm on each tree, although the untreated trees tended to have fewer. Treated trees are recovering from their rather restricted, chunky growth pattern that they had in their first year by putting on more vegetative shoot growth.

Because of the compact growth on the treated trees in the first summer, more fruit buds were formed. They carried more and stronger blossom in the second spring which tended to flower slightly earlier than the control tree blossom, and set significantly more fruits per tree. In the case of the combination treatment; mycorrhiza plus dip, fruit set was often nearly doubled.

Third year establishment [2002]

Results are summarised in Table 3.

There were no apparent differences in the amount of flower bud on any treatment this spring. Most trees were carrying good strong buds and their development and flowering was synchronised.

Trees in the combination treatment tended to set more fruit than the control trees, and those that had mycorrhiza only, tended to set less fruit, but the differences were not significant [mean of 34 trees/treatment]. The weight of individual fruits [from a mean of 50 fruits/treatment] was roughly proportional to the number of fruit set. The mean weight of fruit per tree [number of fruit set x mean fruit weight in g.] was increased to 101% by the mycorrhiza alone and 112% by the combination treatment.

Fruit was not weighed in 2001 but the average fruit weight across all treatments in the following year [106 g] was used to estimate that crop per tree. This enabled a further estimate to be made to compare the yield of each treatment over the two years of the trial: Mycorrhiza alone and mycorrhiza plus dip treatments carried 104% and 119% more fruit resp. than control trees.

Table 1: First year growth response

Treatment	Tree girth 30 cm above union [cm]	Total extension shoot growth [cm]	Mean number of leader shoots
Vaminoc	6.75	27.7	2.0
Vaminoc + dip	6.99	27.3	2.1
Dip only	6.67	36.4	2.1
Control trees	6.82	32.0	1.9

Table 2: Second year response

Treatment	Dip only	Vaminoc	Vaminoc + half rate dip	P value
Mean trunk girth [cm]	8.5	9.0	9.0	0.02
No. extension shoots/tree	5.5	7.8	6.2	n.s.
Mean no. fruits set/tree	6.0	7.1	10.0	0.03

Table 3: Third year response

Treatment	Dip only	Vaminoc	Vaminoc + half rate dip
Mean no. fruit set/tree	37.1	35.7	42.5
Mean fruit weight [g]	105.4	110.5	102.6
Mean weight fruit/tree [kg]	3.90	3.95	4.36
% control	100	101	112
Calculated yield over 2 years [kg/tree]	4.54	4.70	5.46