

CHEMICAL CONTROL OF AVOCADO ROOT ROT – CHEMIGATION

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CHEMIGATION TRIALS

There are three current chemigation trials with a site chosen for a fourth trial and a tentative site for a fifth trial. The current trials are all on newly planted trees as is the fourth planned trial. The fifth trial will be on established trees if all goes well.

South Coast Field Station

Trial one is chemigation-amendment trial at South Coast Field Station field 30 and consists of 24 treatments with 20 replications of each treatment. The experimental design is a randomized block. The trees are Hass with Duke 7 rootstocks planted in May of 1990. Amendments are added once per year as top dressings

TREATMENTS

1. Inoculated control
2. Aliette 22.6 g/tree 2x/year based on leaf flush
3. Ridomil 2.96 g/tree 2x/year based on leaf flush
4. Alfalfa mulch
5. Plastic ground cover (porous)
6. Alfalfa - plastic
7. Steer manure
8. Gypsum
9. Alfalfa - steer manure
10. Alfalfa - gypsum
11. Plastic - steer manure
12. Plastic - gypsum
13. Alfalfa - plastic - steer manure
14. Alfalfa - plastic - gypsum
15. Steer manure - gypsum
16. Alfalfa - steer manure - gypsum
17. Plastic - steer manure - gypsum
18. Alfalfa - plastic - steer manure - gypsum
19. Aliette 22.6 g/tree 1x/yr
20. Ridomil 2.96 ml/tree 1x/yr

21. Aliette 22.6 g/tree 1x/yr - alfalfa - plastic
22. Ridomil 2.96 ml/tree 1x/yr - alfalfa - plastic
23. Aliette 22.6 g/tree 1x/yr - alfalfa - plastic - manure - gypsum
24. Ridomil 2.96 ml/tree 1x/yr - alfalfa - plastic - manure- gypsum

Measurements are taken each June of trunk diameters and canopy volume. Significant differences were noted in both measurements as shown in the tables below. Nitrogen leaf analysis generally followed the applied mulches (those with alfalfa and/or manure generally being higher than others) and not the treatments giving the best growth measurements. While first year data need the confirmation of following years it is exciting in the fact that there are differences showing in the first year.

The tables are Duncan's multiple range analysis. Means followed by different letters are significantly different at the 5 percent level. Aliette 1x/yr-alfalfa-plastic was the best treatment over all followed closely by alfalfa-gypsum; alfalfa-plastic-gypsum; alfalfa-plastic and Aliette at the label rate. One point of interest is that the Aliette 1x/yr-alfalfa-plastic-manure-gypsum treatment is number 4 in canopy volume but number 15 in trunk diameter. Given the failure of most treatments that include manure to do very well it appears that manure has a negative effect on tree growth.

TRUNK DIAMETERS
SOUTH COAST FIELD STATION - FIELD 30 RESULTS

Treatment	Mean (mm)	
Aliette 1x/yr+alfalfa+plastic	27.595	a
Alfalfa+gypsum	27.145	ab
Alfalfa+gypsum+plastic	25.831	abc
Alfalfa+plastic	25.260	abcd
Aliette-label rate	24.515	abcde
Ridomil-label rate	24.395	bcde
Gypsum+plastic	23.975	bcdef
Plastic	23.865	cdefg
Alfalfa	23.755	cdefg
Aliette 1x/yr	23.745	cdefg
Manure+plastic	23.601	cdefg
Alfalfa+gypsum+manure+plastic	23.442	cdefg
Ridomil 1x/yr+alfalfa+plastic	22.890	cdefg
Alfalfa+gypsum+manure	22.889	cdefg
Aliette 1x/yr+alfalfa+plastic+manure+gypsum	22.795	cdefg
Inoculated control	22.785	cdefg
Alfalfa+manure+plastic	22.597	cdefg
Manure	22.578	cdefg
Gypsum+manure+plastic	22.533	cdefg
Ridomil 1x/yr+alfalfa+gypsum+manure+plastic	22.381	defg
Ridomil 1x/yr	21.820	defg
Alfalfa+manure	21.785	efg
Gypsum	20.925	fg
Gypsum+manure	20.475	g

Field 30 canopy volume

Treatment	Mean	
Aliette 1x/yr-alfalfa-plastic	179.10	a
Alfalfa-gypsum	168.57	ab
Alfalfa-plastic-gypsum	154.18	abc
Aliette 1x/yr-alfalfa-plastic-manure-gypsum	153.30	abc
Aliette label rate 2x/yr	147.51	abcd
Alfalfa-plastic	144.69	abcd
Plastic-gypsum	132.37	abcde
Aliette 1x/yr	123.43	bcdef
Ridomil 1x/yr-alfalfa-plastic	114.44	bcdef
Alfalfa-manure-gypsum	113.20	bcdef
Ridomil 1x/yr-alfalfa-plastic-manure-gypsum	110.93	cdef
Alfalfa	108.40	cdef
Alfalfa-plastic-manure-gypsum	100.43	cdef
Plastic-manure-gypsum	97.79	cdef
Manure	97.47	cdef
Ridomil label rate 2x/yr	93.70	def
Inoculated control	93.28	def
Plastic-manure	92.68	def
Plastic	92.30	def
Gypsum	92.26	def
Manure-gypsum	89.27	def
Ridomil 1x/yr	79.30	ef
Alfalfa-plastic-manure	78.81	ef
Alfalfa-manure	70.47	f

Field 30 % nitrogen - leaf samples

Treatment	Mean
Alfalfa-plastic-manure	2.42 a
Alfalfa-plastic-manure-gypsum	2.41 a
Alfalfa-manure-gypsum	2.38 ab
Ridomil 1x/yr-alfalfa-manure-plastic-gypsum	2.37 ab
Alfalfa-plastic	2.35 abc
Aliette 1x/yr-alfalfa-plastic-manure-gypsum	2.35 abc
Alfalfa-plastic-gypsum	2.32 abcd
Aliette 1x/year-alfalfa-plastic	2.31 abcde
Ridomil 1x/yr-alfalfa-plastic	2.29 abcdef
Alfalfa	2.28 abcdefg
Alfalfa-manure	2.27 bcdefgh
Alfalfa-gypsum	2.24 bcdefghi
Manure	2.24 bcdefghi
Manure-gypsum	2.22 cdefghi
Plastic-manure-gypsum	2.19 defghij
Inoculated control	2.18 defghij
Plastic-gypsum	2.18 defghij
Ridomil label rate 2x/yr	2.17 efghij
Aliette label rate 2x/yr	2.16 fghij
gypsum	2.16 fghij
Plastic	2.14 ghij
Plastic-manure	2.12 hij
Aliette 1x/yr	2.10 ij
Ridomil 1x/yr	2.05 j

U.C.R.

Trial 2 is in field 20 at UCR. The trial is a chemigation experiment coupled with foliar sprays of fertilizers and cytokinins. The trial consists of Hass on Duke 7 with 13 treatments of 18 replicates each. The trial was initiated in June 1990 and received setbacks due to heat and cold weather. To date there are no significant differences.

Treatments are:

1. Untreated control
2. Fertilizer only
3. Cytokinin only
4. Fertilizer - cytokinin
5. Aliette chemigation
6. Aliette chemigation - fertilizer
7. Aliette chemigation - fertilizer - cytokinin
8. Aliette foliar
9. Aliette foliar - fertilizer
10. Aliette foliar - fertilizer - cytokinin
11. Ridomil chemigation
12. Ridomil chemigation - fertilizer
13. Ridomil chemigation - fertilizer - cytokinin
14. Aliette chemigation 2x/yr at 22.7 g/tree/application
15. Aliette foliar spray 4x/yr at 6 g/L. Spray till runoff
16. Ridomil chemigation 3x/yr at 2.96 ml/tree/application
17. Fertilizer spray 5x/yr at 2.4 g/L till runoff. Spray is 20% N (6.2% NH₄, 6.2% NO, 7.6% Urea), 20% Phosphoric acid, 20% potash, 0.02% boron, 0.05% copper, 0.1% iron, 0.05% manganese, 0.0005% molybdenum, and 0.05% zinc.
18. Cytokinin foliar spray 3x/yr at 7 ml/L of Westbridge Trigger 0.12%. Spray to wet.
19. Cytokinin soil drenches monthly at 15 ml/L, 200 ml/tree

Embarcadero

The third chemigation trial is in Santa Barbara county and was initiated in August of 1991. It is Hass on Thomas root stock with only 5 treatments due to the limited number of trees. There are no apparent differences in this trial to date. Rates are the same as at field 20 UCR and are as follows:

1. Non treated control
2. Aliette chemigation
3. Aliette chemigation - foliar fertilizer & cytokinin
4. Ridomil chemigation
5. Ridomil chemigation - foliar fertilizer % cytokinin