EFFICIENT NITROGEN APPLICATION TIMING IN PRUNE PRODUCTION

Bill Olson, L. Fitch, D. Ramos, J. Yeager, K. Uriu, J. Pearson, R. Snyder

A low rate of nitrogen (1/4 lb/tree) had been applied and incorporated via water and/or tillage in a uniform replicated three-acre prune plot at different times of year starting in July 1975. The nitrogen application timings are: Dormant (Jan.), Bud Swell (Mar.), Beginning Shoot Growth (May), End of Shoot Growth (July), Post Harvest (Sept.), Leaf Fall (Nov.), and an unfertilized check. After three complete years it was found that the 1/4 lb. rate of actual nitrogen per tree was too low a rate to differentiate between treated and untreated trees. Consequently, in November 1978 the rate was raised to 1/2 lb. actual nitrogen per tree. Of the parameters being measured, statistically significant difference at the 10 percent level was found only with the dry away ratio, dry yield and fruit density per cm trunk. The difference in dry away was mainly a reflection of the variability in soluble solids and pounds fruit pressure at harvest. The Post Harvest, Leaf Fall and Untreated plots had significantly better dry away ratios than the other treatments. The dry yield/cm trunk was significantly poorer in the untreated check. The density of prunes/cm trunk was greatest when nitrogen was applied between Leaf Fall and End of Shoot Growth. The post harvest treatment resulted in fewer prunes than the Bud Swell and End of Shoot Growth treatments. The untreated treatment resulted in fewer prunes than did treatments where nitrogen was applied from dormance through End of Shoot Growth. Bloom strength was obviously lower in the untreated plots, tree variability was too great to show any statistically significant difference. Fruit set was uniform throughout the trial indicating that nitrogen status of the tree has no influence on the ability to set fruit. However, it does have an influence on the number of blossoms and number of fruit produced. Fruit quality parameters such as soluble solids and fruit pressure do not appear to be influenced by nitrogen application date. That is fruit maturity is neither advanced or delayed by different nitrogen application dates. Monthly leaf analysis data for 1979 or 1980 are not available at this time. This trial will be conducted for only one more season. Any conclusion drawn to date would have to be that the time of nitrogen application has no influence on any of the parameters being measured. However, the repeated absence of the application of nitrogen has a negative influence on bloom strength, yield, and fruit size. Nitrogen applied at Post Harvest resulted in some reduction in fruit numbers and yield. However, no conclusions can be drawn about Post Harvest fertilization at this time. There is no evidence that any nitrogen application timing had an influence on the trees' ability to size a given number of prunes (see table). Also, any additional benefit derived from split nitrogen applications under the test field conditions would seem unlikely since no single nitrogen application timing stands out as superior to any other nitrogen application date.

PRUNE NITROGEN TIMING TRIAL[1/] 1980

Nitrogen Application Date	Increase in Trunk Circumference (cm) Since 1975	Shoot Growth Rating[2/] 7/18/80	Bloom Strength Rating[3/]	% Fruit Set 7/18/80	% Soluble Solids 8/13/80	Lbs. Fruit Pressure 8/13/80
1 Jan-Dormant	17.8 a	1.61 a	1.7 a	21.4 a	19.3 a	5.68 a
2 Mar-Bud Swell	16.5 a	1.48 a	1.8 a	27.5 a	18.8 a	5.84 a
3 May-Shoot Growth	19.4 a	1.53 a	1.6 a	24.6 a	18.7 a	6.71 a
4 July-End Shoot Growth	19.1 a	1.64 a	1.7 a	26.5 a	20.2 a	5.83 a
5 Sept-Post Harvest	17.8 a	1.67 a	1.4 a	24.5 a	20.0 a	5.82 a
6 Nov-Leaf Fall	19.8 a	1.83 a	1.4 a	25.4 a	19.4 a	5.79 a
7 Untreated	17.7 a	1.33 a	1.2 ab	26.3 a	20.3 a	5.50 a

Nitrogen Application Date	Lbs. Dry Yield/cm Trunk	Dry Tons /Acre	Dry Away Ratio	Ct/lb.	Fruit Density/ cm Trunk
1 Jan-Dormant	.76 a	3.74 a	3.27 c	70.9 a	56.8 ab
2 Mar-Bud Swell	.84 a	4.18 a	3.24 bc	76.7 a	66.6 a
3 May-Shoot Growth	.75 a	3.76 a	3.29 c	71.9 a	58.0 ab
4 July-End Shoot Growth	.81 a	4.02 a	3.24 bc	75.1 a	63.4 a
5 Sept-Post Harvest	.70 ab	3.46 a	3.04 a	62.4 a	45.5 bc
6 Nov-Leaf Fall	.75 a	3.83 a	3.15 ab	68.4 a	54.3 abc
7 Untreated	.57 b	2.83 a	3.11 a	66.0 a	39.6 c

1/ Values followed by a common letter are not statistically significantly different from one another at the 10% level.

2/ 1 = 0-8" new growth; 2 = 9-16" new growth; 3 = 16+ inches new growth

3/ 1 = good; 2 = average; 3 = poor