

Ethephon concentrations of 75, 100, and 150 ppm delay almond flowering significantly.

Delaying almond bloom with ethephon

L. Todd Browne

George Leavitt

Marvin Gerdtz

Almonds are self-unfruitful and two or more varieties must be planted in one orchard to provide for cross pollination. Since most varieties bloom at slightly different times, there is only partial overlap of bloom with many variety combinations. Thus a treatment that would delay a relatively early blooming variety (for better bloom overlap with a later blooming variety) could potentially increase almond yields.

The plant growth regulator ethephon has been reported to delay bloom on numerous deciduous fruit trees when applied the previous autumn and has potential use for this purpose on almonds. Research was conducted for three years in Fresno County and one year in Madera County to evaluate this hypothesis.

Uniform trees were selected within a block and randomized. Full coverage sprays were applied in November using a handgun at 250 psi. Tests of applications

were also made with large dilute sprayers. At pink bud, 1500 to 2000 flower buds per tree were counted and marked in groups of 100 throughout the test trees. As flowers opened, periodic counts were made to determine percent bloom on specific dates. Floral parts from treated trees were examined in the laboratory to check for any abnormalities resulting from exposure to ethephon.

In May the same groups were examined to calculate percent nut set. Yield data were collected at harvest and nut samples were measured to determine any treatment effects on individual kernel weights.

Results

Results were consistent in all years and both counties (fig. 1). With the early bloom Ne Plus variety in 1974, untreated trees were at full bloom when ethephon-

treated trees were at 2/3 full bloom. In 1975 and 1976, 150 ppm ethephon delayed bloom two and six days, respectively, while in Madera (1976) trees treated with 100 ppm had bloom delayed five to six days (data not shown).

In Fresno County, the bloom delay brought about a longer bloom overlap period with Ne Plus and later blooming Nonpareil. Ethephon-treated Nonpareil trees in Madera County were delayed to cause better bloom overlap with later blooming Mission trees. However, unsprayed Norman variety trees, which usually bloom slightly later than Nonpareil, bloom earlier than ethephon-treated Nonpareil trees and thus poor bloom overlap resulted.

Laboratory examination of blossom floral parts from treated trees revealed no abnormalities. Ethephon treated trees had the same or greater fruit set than untreated trees (fig. 2). Return bloom and fruit set in subsequent years was not adversely affected.

Comparisons showed no yield effect due to ethephon on the treated trees. The average yield in a Fresno County test of treated trees was 30.7 kernel pounds per tree, and of untreated trees was 30.6 kernel pounds. In Madera County, the averages for Nonpareil with Mission pollinators were 11.5 kernel pounds per treated tree and 10.9 kernel pounds per untreated tree. Nonpareil trees with Norman pollinators yielded 11.6 and 13.7 kernel pounds per tree for the treated and untreated, respectively. The drop in yield for treated Nonpareil trees with Norman pollinators is probably due to reduced bloom overlap, as previously mentioned.

Comparison of individual kernel weights was made in 1976. In Madera County all treated trees regardless of pollinator yielded slightly smaller kernels. The average weight per kernel was 1.11 grams and 1.18 grams for treated and untreated trees, respectively, while in Fresno County treated kernels tended to be slightly smaller too, but not significantly so (1.26 grams from treated vs. 1.29 grams from untreated).

It is well recognized that adequate bloom overlap of interfruitful almond varieties is essential for cross pollination. Ethephon-treated pollinator trees bloomed later, overlapped better, and produced yields similar to untreated trees. Yields of untreated later blooming varieties were not measured because individual trees could not be isolated without interfering with pollen transfer by bees. Thus the question of whether delaying early

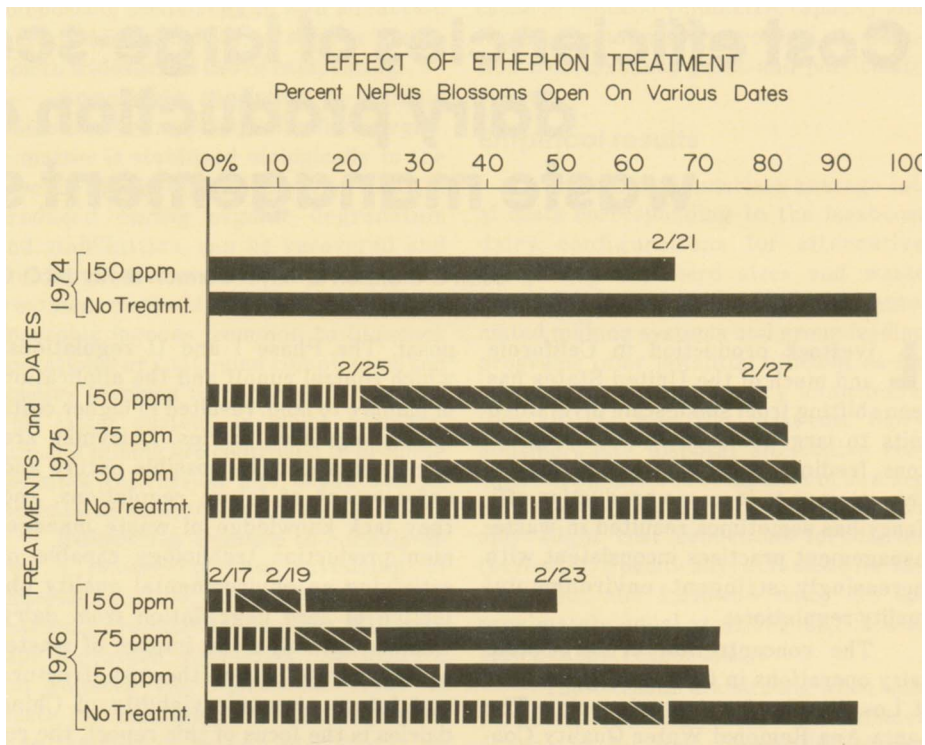


Figure 1.

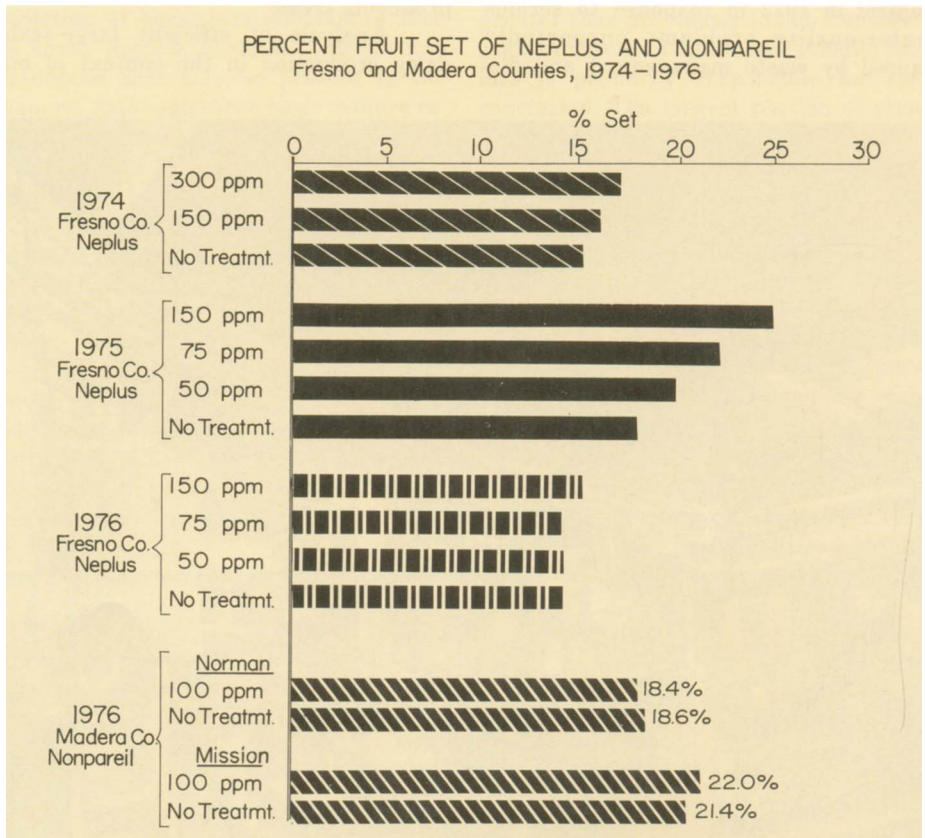


Figure 2.

blooming varieties improves orchard yield remains unanswered though the potential was strengthened because we were able to improve overlap of bloom.

Ethephon is not registered for use on almond trees at the present time.

L. Todd Browne is Farm Advisor, Fresno County; Marvin Gerds is Extension Pomologist, San Joaquin Valley Research and Extension Center, Parlier; and George Leavitt is Farm Advisor, Madera County.