

Chemical Control/New Products

Evaluation of Ethrel With and Without Silwet or ProGibb for Acceleration of Postharvest Fruit Maturity in Pears

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Two trials were conducted in commercial pear orchards in the Suisun Valley and Sacramento River Delta. In both trials, ten treatments were replicated four times in a randomized complete block design. Treatments were applied with a handgun operating at 200 psi with a finished spray volume of 400 gal/acre. In the Suisun Valley trial, the treatments were ethephon at 0, 300, 600 and 1200 ppm (0, 1, 2 and 4 pt Ethrel per 100 gal) with and without Silwet L-77 at 0.05% and 0.10% by volume. The treatments were applied between 8:45 a.m. to 12:15 p.m. on 27 July. Temperature at 8:45 a.m. was 77°F and at 12:15 p.m. was 91°F. The pH of the water was 6.84. In the Sacramento River Delta trial, the treatments were ethephon at 0, 300, 600 and 1200 ppm (0, 1, 2 and 4 pt Ethrel per 100 gal) with and without gibberellic acid at 25 and 50 ppm (10 and 20 oz ProGibb 4% per 100 gal). The treatments were applied between 7:50 a.m. to 11:45 a.m. on 8 Aug. Temperature at 7:50 a.m. was 68°F and at 11:45 a.m. was 82°F. The pH of the water was 6.76.

The effect of Ethrel with and without Silwet or with and without gibberellic acid on fruit drop and fruit maturity (fruit pressure and fruit color) was evaluated at 7 and 14 days after treatment (DAT). The day before treatment, fruit color and pressure were determined on 25 rattail and 25 mature green fruit from the plot. In addition, 10 rattail and 25 mature green fruit were flagged per replicate. Percent fruit drop was based on the number of flagged fruit remaining on the trees at 7 and 14 DAT. Fruit maturity was based on color using standardized peach maturity color chips which were provided by the California Tree Fruit Agreement. The chips were modified to reflect more accurately pear maturity. We assigned color A=1, C=2, D=3, H=4, I=5 and J=6. Fruit pressure was determined with a penetrometer taking 3 readings per fruit. At 7 DAT, fruit color and pressure were determined on 5 unflagged rattail fruit and mature fruit per replicate. At 14 DAT, fruit color and pressure were determined on all flagged fruit remaining on the trees.

The Suisun Valley trial should be considered a rigorous test of Ethrel and Silwet. The materials were applied two to three days after the study site was picked and picking operations were continuing in the orchard on the date of application. Mature fruit drop was significantly increased over the untreated control with the use of Ethrel (2-4 pt/100 gal) while rattail fruit drop was not increased with the use of Ethrel. The addition of Silwet to the Ethrel did not greatly increase the mature fruit drop. Past research has shown that if pears reach a fruit color of 3 or greater and fruit pressure of 10 kg/cm² or less then the pears cannot support the complete larval development of codling moth. The pears are rotting faster than the larvae can complete their development. Based on this research, 1200 ppm ethephon (4 pt Ethrel/100 gal) and possibly

600 ppm ethephon (2 pt Ethrel/100 gal) plus 0.05% Silwet would prevent codling moth development in mature fruit but not rattail fruit at 14 DAT. Next spring, we will evaluate the trees for return bloom and fruit set.

The Sacramento River Delta trial should be considered a fairly rigorous test of Ethrel and ProGibb. The materials were applied seven to eight days after the study site was picked and picking operations terminated in the orchard on the date of application. Mature fruit drop was significantly increased with the use of Ethrel (2-4 pt/100 gal) while rattail fruit drop was only slightly increased with the use of Ethrel. From this trial, 1200 ppm ethephon (4 pt Ethrel/100 gal) at 7 DAT and all rates of ethephon at 14 DAT would prevent codling moth development in mature fruit. However, only 600 and 1200 ppm ethephon (2 and 4 pt Ethrel/100 gal) at 14 DAT would prevent codling moth development in rattail fruit. The addition of ProGibb to ethephon did not greatly accelerate fruit maturity. Next spring, we will evaluate the trees for return bloom and fruit set.