# CHEMICAL THINNING OF PEACHES & NECTARINES
## 1997 Kearney Tree Fruit Review

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Researchers have been searching for an effective stone fruit thinning chemical for many decades. Literally hundreds of materials have been tested but none have proven consistent enough for widespread use. Recently, several chemicals have shown enough promise for private companies to pursue registration on stone fruit in California. These materials are either on the market now or are expected to be soon. Over the past several years, we have carried out extensive evaluations with both handgun applications to single trees and airblast sprayer treatments to larger blocks. This report will summarize those results and suggest directions for the future.

Three chemicals will be discussed: Armothin, Wilthin and Ralex (previously known as Release). The first two are blossom thinners applied during bloom. They essentially "bum" off flowers, thus preventing fruit from developing. They can also cause phytotoxicity to leaves and shoots. Ralex contains a plant hormone that prevents the formation of flower buds. It is applied to trees during the previous spring when flower bud initiation is occurring.

### Handgun trials

A given material applied by handgun often produces different results than when applied by an orchard sprayer. Therefore, the results of handgun trials are often less reliable and will only be dealt with briefly here to make a few points.

Armothin, when applied at a rate of 3 gals/100 gals, produced fairly consistent results among varieties, dates and percent bloom (Table 1). It reduced fruit load to about half of the control which is a realistic target to aim for. The one exception to this was Mayglo in 1997 where almost all flowers on the tree were burned off. We are not sure why overthinning occurred in this instance since it did not occur with the same variety in 1996. Perhaps the extremely early bloom and weather conditions at the time made the trees more susceptible.

Table 1. Handgun trials with Armothin applied during bloom in 1996 and 1997.

| Variety | Date | % Bloom | Rate of material (gals/100 gals) | Fruitlets remaining (% of control) |
|---|---|---|---|---|
| Mayglo | 2/14/96 | 75 | 1.5 | 41 |
| Spring Bright | 2/23/96 | 40 | 1.5 | 83 |
| Spring Bright | 2/28/96 | 80 | 1.5 | 84 |
| Summer Lady | 3/8/96 | 30 | 1.5 | 84 |
| Summer Lady | 3/11/96 | 90 | 1.5 | 88 |
| Mayglo | 1/31/97 | 90 | 1.5 | 11 |
| Spring Bright | 2/24/97 | 85 | 1.5 | 90 |
| O'Henry | 3/5/97 | 50 | 1.5 | 89 |
| Mayglo | 2/14/96 | 75 | 3.0 | 51 |
| Spring Bright | 2/23/96 | 40 | 3.0 | 53 |
| Spring Bright | 2/28/96 | 80 | 3.0 | 61 |
| Summer Lady | 3//8/96 | 30 | 3.0 | 55 |
| Summer Lady | 3/11/96 | 90 | 3.0 | 86 |
| Mayglo | 1/31/97 | 90 | 3.0 | 0 |
| Spring Bright | 2/24/97 | 85 | 3.0 | 52 |
| O'Henry | 3/5/97 | 50 | 3.0 | 75 |

Wilthin did not seem to be as effective (Table 2). Similar to Armothin, it tended to overthin Mayglo but otherwise did not show much thinning activity. Even when we tried higher rates (data not shown), no significant thinning effect was observed.

Table 2. Handgun trials with Wilthin applied during bloom in 1996 and 1997

| Variety | Date | % Bloom | Rate of material (quarts/100 gals) | Fruitlets remaining (% of control) |
|---|---|---|---|---|
| Summer Lady | 3/8/96 | 30 | 2 | 81 |
| Summer Lady | 3/11/96 | 90 | 2 | 88 |
| Mayglo | 1/31/97 | 90 | 2 | 33 |
| Spring Bright | 2/24/97 | 85 | 2 | 128 |
| O'Henry | 3/5/97 | 50 | 2 | 109 |
| Summer Lady | 3/8/97 | 30 | 4 | 69 |
| Summer Lady | 3/11/96 | 90 | 4 | 91 |
| Mayglo | 1/31/97 | 90 | 4 | 22 |
| Spring Bright | 2/24/97 | 85 | 4 | 86 |
| O'Henry | 3/5/97 | 50 | 4 | 91 |

Ralex (Release) was evaluated on 7 varieties in only one year. Several of the varieties showed a good thinning response of about 50% reduction in flowers (Table 3). Mid May appears to be the

most effective timing with early June also showing activity. Applications made later in the season, at this rate of 32 g a.i./acre, were not effective (data not shown).

Table 3. Handgun trials with Ralex (Release) in 1993. All treatments applied at rate of 32g a.i./acre.

| Variety | Date | Flower density in 1994 (% of control) |
|---|---|---|
| Early Maycrest | 5/14/93 | 68 |
| Mayglo | 5/14/93 | 82 |
| Spring Lady | 5/14/93 | 53 |
| Sparkling May | 5/14/93 | 60 |
| Elegant Lady | 5/14/93 | 94 |
| Fantasia | 5/14/93 | 84 |
| Cal Red | 5/14/93 | 56 |
| Early Maycrest | 6/4/93 | 61 |
| Mayglo | 6/4/93 | 78 |
| Spring Lady | 6/4/93 | 68 |
| Sparkling May | 6/4/93 | 86 |
| Elegant Lady | 6/4/93 | 110 |
| Fantasia | 6/4/93 | 111 |
| Cal Red | 6/4/93 | 73 |

**Airblast Sprayer Trials**

Airblast sprayer trials using Armothin and Wilthin were evaluated on several different varieties (Table 4). In each case blocks of about 1 acre were used for each treatment.

In contrast to the handgun trials, Wilthin tended to overthin. Fruit loads were so reduced in both the Crown Princess and O'Henry varieties that yields were substantially decreased even with no touch up hand thinning. O'Henry also had some gumming on fruiting shoots and several varieties exhibited dieback of weaker shoots.

Wilthin performed adequate thinning on both the Sparkling June and Loadel varieties (Table 4). Although some trees were obviously overthinned and others underthinned, it was felt on the average that trees had about the right fruit loads. Therefore, no follow up hand thinning was performed on these 2 varieties. The resulting yields were equal or slightly greater than hand thinned controls. However, because of underthinned areas in the trees, there were more undersized fruit and a greater percentage of doubles and deformed fruit. Overall, the decrease in fruit quality probably canceled out the savings in hand thinning. In general, the rate ofWi1thin used in these airblast sprayer trials was too high. Future studies will evaluate rates 25 to 50% lower.

Table 4. Airblast sprayer trials with Armothin and Wilthin applied during bloom in 1996 and 1997.

| Variety | Date | % Bloom | Material & rate | Fruitlets remaining (% of Control) |
|---|---|---|---|---|
| Spring Lady | 3/6/96 | 80 | Armothin -2.5 gals/l00 gals | 34 |
| Crown Princess | 3/4/97 | 85 | Armothin -2 gals/l00 gals | 63 |
| Sparkling June | 3/4/97 | 65 | Armothin -2 gals/l00 gals | 80 |
| Loadel | 3/7/97 | 90 | Armothin -2 gals/l00 gals | 90 |
| O'Henry | 3/7/97 | 90 | Armothin -2 gals/l00 gals | 62 |
| Crown Princess | 3/4/97 | 85 | Wilthin -8 quarts/200 gals | 20 |
| Sparkling Lady | 3/4/97 | 65 | Wilthin -8 quarts/200 gals | 61 |
| Loadel | 3/7/97 | 90 | Wilthin -8 quarts/200 gals | 52 |
| O'Henry | 3/7/97 | 90 | Wilthin -8 quarts/200 gals | 8 |

The Armothin treatments did not have as much tendency to overthin (Table 4). On three ofthe varieties (Crown Princess, Sparkling June & Loadel) we could measure no differences in hand thinning times compared to the controls, even though there was some evidence of reduced fruit loads. Therefore, chemical thinning offered no economical advantage with these varieties.

Thinning on Spring Lady was a bit excessive and yields were reduced in this variety. However, thinning crews were given instructions based on the control trees where they had plenty of fruit to select from. Therefore, they didn't compensate for the shoots where all or most of the fruit were "burned" off. With instructions to leave more fruit where possible, the thinning crews probably would have been able to leave a normal fruit load and thus maintain typical yields.

Thinning with Armothin in O'Henry was one situation that could definitely be considered a success. Fruit load was reduced enough (62% of control) that hand thinning time was decreased by about 30 hours per acre. At the same time, there was enough fruit remaining for good selection so yield was not reduced. In addition, the reduced fruit load stimulated better fruit growth leading to an increase in fruit size at harvest. The savings in hand thinning time and improved fruit size amounted to a substantial economic gain.

**Should I use a chemical thinner?**

The chemical thinners that will soon be available for stone fruit have the potential for success. They also have the potential for dismal failure. Whether they succeed for you will depend on many factors, some of which we don't fully understand at this time. Research will continue so we can better understand the various factors involved and improve your chances for success.

If you are interested in trying chemical thinning, we recommend considering the following:

1. Conduct your own research. Try the materials on an acre here and there, and then keep good notes on damage, thinning times, bin counts and fruit sizes.

2. Do not use the blossom thinners on early varieties. The damage caused by these sprays seems to set the tree back enough to cause irreversible loss in fruit size. Later varieties have sufficient time to catch up and even surpass the fruit growth of heavily laden control trees.

3. Avoid varieties that produce lots of doubles. Also keep doubling as low as possible by avoiding water stress in August and early September.

4. Work with varieties that tend to produce heavy crop loads every year.

5. Remember that each variety will probably respond differently to a given material. Therefore, if you have a rate and timing that seems to work for one variety, it may totally fail on another variety.

6. Finally, be creative as you figure out how to work with these materials. Perhaps just spraying the top or one side of the tree could be effective. Also, it may take some creative ideas to teach thinning crews how to leave more fruit on some shoots to compensate for fruit loss elsewhere.

These suggestions will not guarantee success but they should at least improve the odds. Research work will continue and hopefully we will learn each year from our experiences. Perhaps, some day chemical thinning will be a standard practice in stone fruit orchards.