Final Report for a Project in 2005

Presented to the Utah Horticultural Association

Project Title: *Blossom Thinning of Apples and Peaches with New Blossom Thinners*

Personnel: **Project Leader**: **Dr. Essie Fallahi**, Professor and Director of Pomology, University of Idaho, Parma Research and Extension
Technical Support: Bahar Fallahi and Benito Morales, University of Idaho.

Organization: University of Idaho, Parma Research and Extension Center 29603 U of I Lane, Parma, Idaho 83660

Justification:

Thinning of pome and stone fruit is a necessary but costly practice. Cost of hand thinning for stone fruit would range from $500 to $1200 per acre, thus cost prohibitive. We have experimented with hydrogen cyanamide (Dormex), lime sulfur, fish oil, and other blossom in several varieties of peaches, nectarines, 'Empress' and 'Friar' plums in the last 18 years. Results are very promising. In 2003, in addition to many other blossom thinners, we started using **Tergitol TMN-6** (a surfactant) extensively, for the first time, in several orchards in different regions, and blossom thinning results on peaches and plums were outstanding, **with up to 55 to 60% saving in hand thinning**. In 2004 and 2005, we continued using this chemical in different orchards in Washington, Utah, and Idaho with very promising results (results will be presented in details at the Washington soft fruit meeting). This chemical was found to be a very dependable blossom thinner during these years. However, similar to any blossom thinner, time and concentration of application can play a major role on blossom thinning and our information on exact timing and rate of application for most blossom thinners, particularly Tergitol TMN-6 is limited. In 2004 and 2005, we found that concentrations at ranges of 0.5% to 1.25% work better than any blossom thinner that we have dealt with during the past 20 years. The great aspect of Tergitol is that it does not leave mark on peaches OR NECTARINES, while it significantly reduces cost of hand thinning in these fruits.

Due to the great success that we have observed in stone fruit blossom thinning with Tergitol TMN-6, we propose to fine-tune the timing and concentrations of Tergitol TMN-6 blossom thinners for optimum thinning of peaches and nectarine during 2006-2007 seasons.

Objectives for Apples:

1) To experiment with different concentration and spray volume of Tergitol TMN-6 blossom thinner alone or in combination with other blossom thinners and consequence of the sprays on fruit quality and fruit marking on apples in Washington and Idaho. This experiment will be in conjunction with Dr. Jim McFerson on apples in Washington.

2) To study the effects of combination of Fish Oil and Lime Sulfur and perhaps other thinners on apple blossom thinning and ultimately yield and fruit quality and fruit marking.

Objectives For Peaches And Nectarines:

1) To study the effects of different of Tergitol TMN-6 at 3 different blooming time treatments in peaches and nectarines: Other blossom thinners such as lime sulfur were also tested. This experiment was in conjunction with different growers in Utah, Idaho, and Washington.

2) To study the effects of each application on fruit marking, fruit color, and size in peaches and nectarines.

Significant Findings in Apples:

1. Tergito TMN 6 at higher than 0.5% may cause over thinning.

2. Tergitol at rates of 1 to 2.5 pints in 100 gal applied at full boom reduced fruit set. 1.5-2.5 pints per 100 gal were more effective than lower concentrations.

3. Tergitol at each rate of 1.5, 2 and 2.5 pints in 100 gal significantly reduced fruit set and resulted in significant reduction in time of hand thinning while showed no sign of fruit marking at all. Thus, this chemical may have a great potential for Rome blossom thinning.

4. Tergitol at 1.5 pints or 2 pints/100 gal reduced fruit set in Red Delicious apple, but caused russetting (burning) on the fruit.

5. Tergitol at up to 2.5 pits in 100 gal did not reduce fruit set in Fuji while caused fruit marking.

6. Fish oil at 3% or lime sulfur at 6% single or double applications reduced fruit set.

Significant Findings In Peaches And Nectarines :

1. Lime sulfur at 6% effectively thinned peaches and plums in some years but not every year.

2. Tergitol effectively thinned peaches in various orchards in Idaho and Utah and Washington during 2003, 2004, and 2005. Other than hydrogen cyanamide, Tergitol is the most effective blossom thinner we have experienced with for peach and plum thinning.

3.The most effective concentrations for thinning is between 0.75% to 1.2%. Concentrations at 2 and 3% results in over thinning.

4. Tergitol at 0.75% and 1% significantly reduced fruit set in Empress plum and reduced the needs for hand thinning by about 50%.

5. Tergitol did not have any adverse effect or fruit marking on peaches or plums.

6. Time of application is very important and we intend to continue or research with Tergitol and “fine tune” the timing of application in 2006 season.

General Results and Discussions:

Tergitol TMN 6 at higher than 0.5% may cause over thinning. Tergitol at rates of 1 to 2.5 pints in 100 gal applied at full boom reduced fruit set. 1.5-2.5 pints per 100 gal were more effective than lower concentrations. In Rome Beauty apple, Tergitol at each rate of 1.5, 2 and 2.5 pints in 100 gal significantly reduced fruit set and resulted in significant reduction in time of hand thinning while showed no sign of fruit marking at all. Thus, this chemical may have a great potential for Rome blossom thinning.

Tergitol at 1.5 pints or 2 pints/100 gal reduced fruit set in Red Delicious apple, but caused russetting (burning) on the fruit. Tergitol at up to 2.5 pints in 100 gal did not reduce fruit set in Fuji while caused fruit marking.

Fish oil at 3% or lime sulfur at 6% single or double applications reduced fruit set.

In conclusion, Tergitol can be an effective blossom thinner for certain apple cultivars but not all. We found that Tergitol is an effective blossom thinners for peaches and plums without any adverse effects on these fruits. Lime sulfur, as a blossom thinner works, but results are not always consistent from year to year. We are going to continue our research with apple blossom thinners in 2006.

For peaches and nectarines, concentrations between 0.50% and 1.25% were best, although somewhere around 0.75% and 1% look optimal, depending on the stage of followers. The blossom thinners are more effective if they are applied earlier during the blossom stage. The results from Utah orchards were excellent and we intend to continue this experiments in Utah (in several orchards), Idaho and Washington during 2006 season and will greatly appreciate Utah’s continued support.