2007 – Evaluating Ethrel as a tool to remove breba crop

Carlos H. Crisosto, Vanessa Bremer, Maxwell Norton, Dan Rivers, and Louise Ferguson.

Department of Plant Sciences
University of California, Davis
Kearney Agricultural Center

In some cultivars breba figs are considered an undesired crop as production is too low to be commercially important and the presence of dropped fruit in the orchard can attract pests and serve as a reservoir for fungi. In 2005 we started our experiments with Ethrel to attempt to remove breba figs from 'Black Mission' and 'Conadria'. To accomplish this, we took two approaches:

- We applied Ethrel in the fall, at leaf fall, to stop flower differentiation and, therefore, the breba crop the following spring.

- Ethrel spring sprays were applied during early fruit development to promote early fruit abscission.

While Ethrel treatments were successful in reducing breba crop, some phytotoxicity was observed on trees sprayed with spring concentrations 1000 ppm AI at intermediate breba development stage. This season the study was repeated with spring concentrations of 250, 500 and 1000 ppm AI and two application dates, as we believe that timing of spring application may be important since stress from high temperature and drought is known to make trees more susceptible to defoliation after Ethrel application, and three fall application dates.

This season we are focusing on finishing a safe protocol to remove brebas, determining chilling units for different cultivars, and to begin developing a technique to break apical dominance.

Breba Abscission with Ethrel Treatments

Fall Sprays. Ethrel to reduce flower differentiation on 'Conadria' figs was applied at three different concentrations and three times during leaf drop during dormancy (winter/spring). A control (untreated), water plus a wetting agent, and three concentrations of Ethrel (250, 500 and 1,000 ppm AI) prepared in water with a wetting agent were applied at three different times (application date) starting at 20% leaf drop, 80% leaf drop and 100% leaf drop to produce 15 treatment application date combinations. These treatments were applied to individual 'Conadria' fig trees in a commercial orchard using a mist blower until the trees were damp just prior to runoff. Each treatment was replicated eight times in the field (total of 8 trees per each of 5 treatments = 40 trees total per application date).

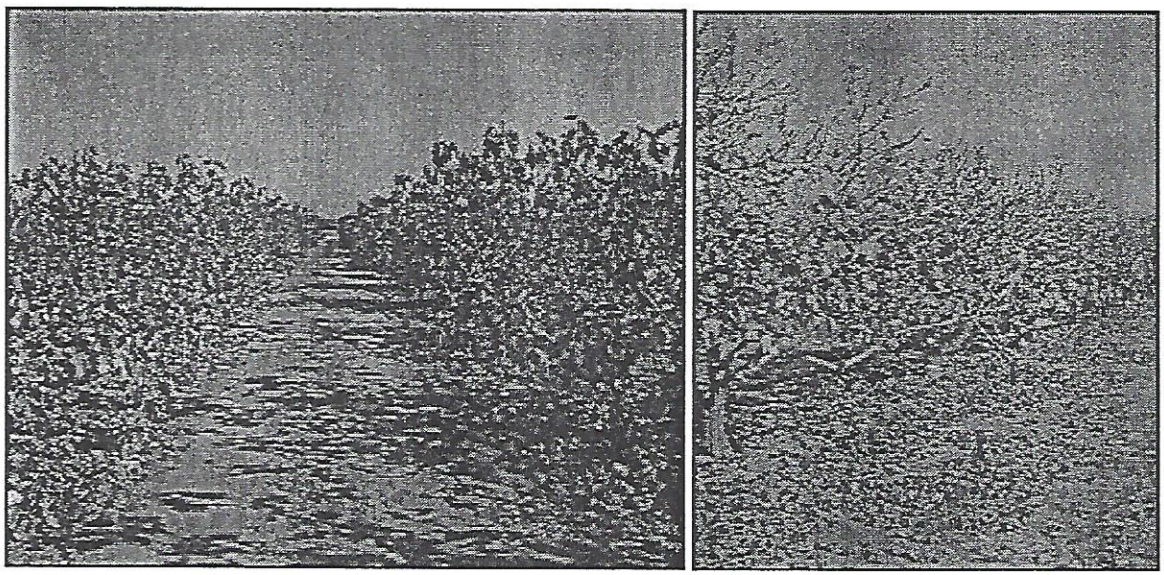

Figure 1. Ten percent of leaf drop (left); and 80% leaf drop (right).

Spring Sprays. This season, we proposed to finish evaluating the ability of Ethrel to abscise breba figs on 'Conadria'. A control (untreated), water plus a wetting agent, and three concentrations of Ethrel (250, 500 and 1,000 ppm AI) prepared in water with a wetting agent were applied at two different times (application date) when the breba fruit first start to form and then again 10 days later to produce ten treatment application date combinations. These treatments were applied to individual 'Conadria' fig trees in a commercial orchard using a mist blower until the trees were damp just prior to runoff. Each treatment was replicated eight times in the field (total of 8 trees per each of 5 treatments = 40

trees total per application date). Weekly observations of the treatments are being made with respect to fruit abscission, leaf abscission, and phytotoxic response.

In both trials, visual damage symptoms and yield (breba and fig) will be evaluated during the spring and summer.

Figure 2. Breba fruit first start to form (left); breba approximately 10 days later (right).

PRELIMINARY 2007 RESULTS

Breba Abscission with Ethrel Treatments

Spring Sprays.

- Lower amounts of breba per tree (breba harvested) and breba per unit area were observed on trees treated with high concentrations of Ethrel (500 ppm and 1000 ppm) plus surfactant in the case of 'Conadria'.

- The trees that were sprayed at the "beginning development" stage of 'Conadria' yielded lower amounts of breba per tree (breba harvested) and breba per unit area than the ones sprayed at the "intermediate development stage".

- Ethrel treatments did not affect the bud break in either case for 'Conadria'.

- Phytotoxicity was not observed in any of the treatments except for the trees with an application concentration of 1000 ppm Ethrel plus 0.05% surfactant at the "intermediate development" stage.

- These treatments should be repeated with a higher number of replications in several orchards to evaluate orchard and season effect on treatment performance prior to commercial application.

Fall Sprays.

- Ethrel treatments did not affect the percentage of bud break and phytotoxicity was not observed in any fall treatment.
- Detailed evaluation will be carried out later in the season.
- The experiment using high Ethrel concentrations should be repeated with a higher number of replications and in several orchards.