

NOT CONTROLLING SWD IN ORGANIC BERRIES

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Nine years ago, there was an estimated 600 acres of organic blueberries in the United States. By the end of 2015, Washington will have in excess of 2,500 acres of organic blueberries and has established itself as the leading producer of this crop in the world. Acreage of this crop is expanding due to the favorable prices received and the relative lack of insect and disease pressure the industry has enjoyed. Approximately 90% of organic blueberries are located in eastern Washington. Prior to 2012, virtually no insecticides or fungicides had been applied to blueberries grown in eastern Washington. [Blueberries produced in western Washington have significant disease and insect pressure.] Spotted wing drosophila (SWD) was detected in eastern Washington in 2010 but was not sufficiently widespread, present in sufficient numbers or was not noticed prior to 2012. The year 2012 was a turning point for blueberry production. Several growers deployed significant SWD programs, other growers less aware of the pest or less sophisticated in the SWD control programs suffered significant losses due to the insect.

For fresh blueberries, detection of a single larvae per pallet results in rejection. Processed blueberries have lower standards, but production of blueberries for the processed markets require a competent SWD control program. Several shipments of blueberries from eastern and western Washington have been rejected due to the presence of SWD. The Washington Blueberry Commission is under significant pressure to respond to this situation. For conventional growers, there are a number of insecticidal options available and WSU's Lynell Tanigoshi has evaluated these products. Unfortunately, only one organically approved insecticide (Entrust, spinosad, Dow AgroSciences) has been demonstrated to have sufficient efficacy against SWD, prior to the beginning of this research program. Organic blueberry growers rely heavily on Entrust and the Washington (and California and Oregon) organic blueberry industry is very dependent on this product. One of the challenges growers have is that there is a limit on the amount of the product that can be made during the course of the season, resulting in growers using lower rates in order to extend coverage throughout the season. The registrant of Entrust, Dow AgroSciences, now requires use of an alternative, effective insecticides after every two applications. Growers currently question whether there is anything effective enough to rotate with Entrust.

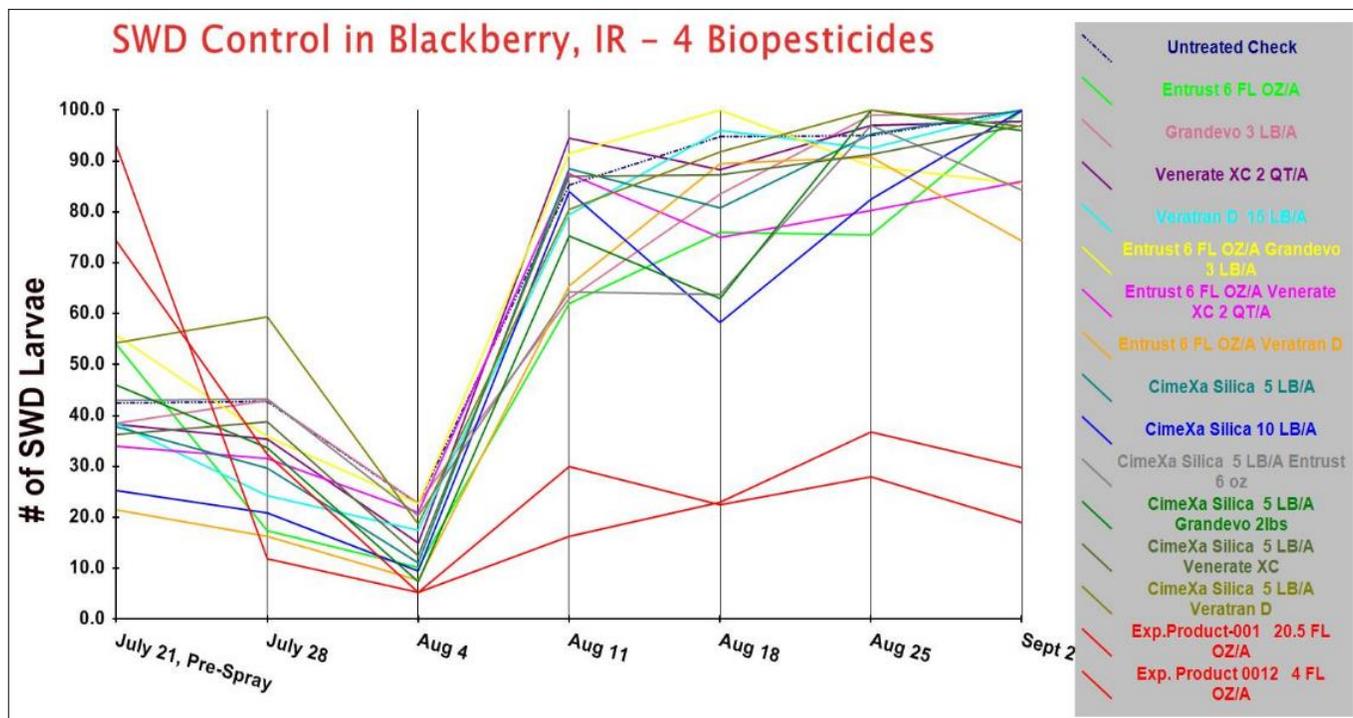
SWD has been documented as having developed resistance to Entrust in blueberries in the Watsonville area of California. While strong scientific data may be lacking demonstrating resistance in SWD to Entrust, two things are known: 1) Entrust is not working as well as it once did against SWD in the areas where it has been used the longest and 2) such heavy reliance on a single mode of action, year after year in a pest with a propensity to develop resistance is a risky situation. The Washington blueberry industry is desperate to develop new organic products for SWD control. In a late season SWD blackberry trial, Schreiber's group has developed successful data for three organic products demonstrating that 1) he can complete a SWD trial, 2) addition of sugar improves efficacy of products not previously known to control SWD and 3) there are other products potentially available. The data collected at present is not sufficient enough to call them equivalence to Entrust.

The 2015 research project was conducted in concert with a national effort looking at organic controls for SWD. Our effort in 2015 took a wrong turn when we agreed to trial a number of treatments involving an organic product that turned out to have no efficacy against SWD. It had previously been shown to have

efficacy against bed bugs and other household pests. As a result, we have less to show for 2015 results than in previous years.

Discussion of Results:

2015 was characterized by a mild winter and a very warm summer. It is believe that SWD were more successful overwintering due to the mild temperatures, and because of the warmer summer they were present earlier and in higher numbers than has ever been seen in the region. As a result, the first sampling of newly ripe fruit for SWD was already heavily infested. Treatments ranged from an average of 1 to 5 larvae per fruit and this was before we started spraying. Our first application was on July 21, two weeks earlier than we have ever treated for SWD in blackberry before.



Once SWD becomes established it is difficult if not impossible to control the pest organically in berries. No treatment provided commercially acceptable levels of control. The most effective organic treatment was Entrust at 4 oz mixed with corn syrup, followed Entrust at 6 oz and Entrust rotated with Veratran. The addition of corn syrup to Entrust has for the past two years has been the most effective of treatments. It is unknown what caused the decline in SWD numbers during the August 4th sampling date.

**For comparative purposes, two conventional insecticides (Exirel and Mustang Maxx) were included in the trial. It is clear that the organic treatments simply do not provide the level of control as does a commercial conventional synthetic insecticide. These results demonstrate the need to start control programs early, as soon as fruit starts to turn color. In a year of unusually warm weather, applications should begin earlier than what a grower would intuitively think to start spraying. Applications should have intervals of 5 to 7 days, at higher rates and the additional of a feeding stimulant appears to approve efficacy.



Photo #1 (above) – Over the Row multi treatment CO₂ sprayer that was used to make research applications to the organic SWD blackberry trial in Eltopia, WA.