HOW IMPORTANT ARE SANITATION PRACTICES IN THE *D. SUZUKII* WORLD?

Amy J. Dreves[1] and Amanda Ohrn[1], Wei Yang[2], A. Basey, H. Andrews, and M. Marcus
[1]Crop and Soil Science Department and [2]NWREC-Hort, Oregon State University, Corvallis, OR
Amy.Dreves@oregonstate.edu

Introduction

Sanitation practices have been a key management tool in many cropping systems to prevent the introduction or spread of pest infestations. Removal and proper disposal of infested fruits may prevent *Drosophila suzukii* (spotted wing Drosophila, SWD) population buildups and reduce insecticide applications currently necessary to keep fly numbers low.

A 2nd year of research was implemented in 2013 to address two questions of concern: 1) Whether SWD will oviposit in fallen blueberries when competing with hanging ripe fruit or after harvest, and 2) If SWD oviposit in fallen fruit, whether eggs can fully develop to adulthood. Currently growers rely heavily on many protective insecticide applications to keep fly pressure at a minimum. However, excessive use of insecticides threatens existing IPM programs and increases the likelihood of insecticide resistance. Is sanitation worth the action and expense to reduce SWD pressure? Can innovative practices be designed to achieve an effective and economical means to reduce SWD spread?

Methods. In 2013, several field trials were conducted in the mid- and northern Willamette valley, OR to assess SWD's oviposition preference and development in fallen fruit from no-spray and chemically-treated blueberry farms, varieties Bluecrop, Aurora, Berkeley and Elliott. In a trial to determine the ability of SWD to oviposit in fallen fruit, exclusion cages (allowing SWD entry only) were placed over fallen blueberries. Samples of 40-100 berries were collected for sugar extractions at 0 (untreated control), 2, 4, 7, 9, 11, 14, 16, 18, and 21 days after outdoor exposure to seasonal field conditions. Larvae were placed in developmental cups to determine *Drosophila* spp. Treatments (exposure periods) were replicated 4-5 times during harvest (July and Aug) and late-harvest periods (Aug and Sept). Daily temperature and precipitation were recorded. Each field site was monitored for adult activity using 6-hole red cup and standard apple cider vinegar (5%) bait. Male and female SWD were counted.

To determine the survival of SWD in fallen fruit, one hundred SWD-infested blueberries

were placed in ground exclusion cages beneath blueberry plants. Survival of SWD larvae exposed to field conditions (from 0 (untreated control) to 21days)was determined at each evaluation date using the salt extraction method. Adult eclosion was recorded from all exclusion cages on evaluation dates.

Results. Leftover hanging fruit, and berry drop from machine-harvesters and spray equipment may increase risk of SWD spread. Monitoring trap catch revealed low (<5 flies/trap/week) and high fly levels of SWD (>5-300) at chemically-treated and no-spray blueberry farms, respectively.
Little to no *Drosophila* eggs or larvae were found in fallen berries at chemically-treated farms. The proportion of SWD oviposition in ground fruit at the no-spray blueberry farm averaged 26 (n=55 larvae recovered) to 88% (n=25 larvae recovered) compared to the total number of *Drosophila* larvae extracted over nine evaluation dates, harvest and post-harvest period, respectively (Figure 1). By the end of the post-harvest period, berry weight was reduced by 44-66% compared to the beginning of the harvest period in clean fallen fruit. A proportion of SWD larvae survived (Figure 2) and adults eclosed in outdoor exclusion cages from ground blueberries exposed to seasonal field conditions under drip-irrigated blueberry plants at no-spray farm during the harvest and post-harvest period, respectively. Berry weight was reduced by 66-69% in infested ground fruit by 21 days after treatment.

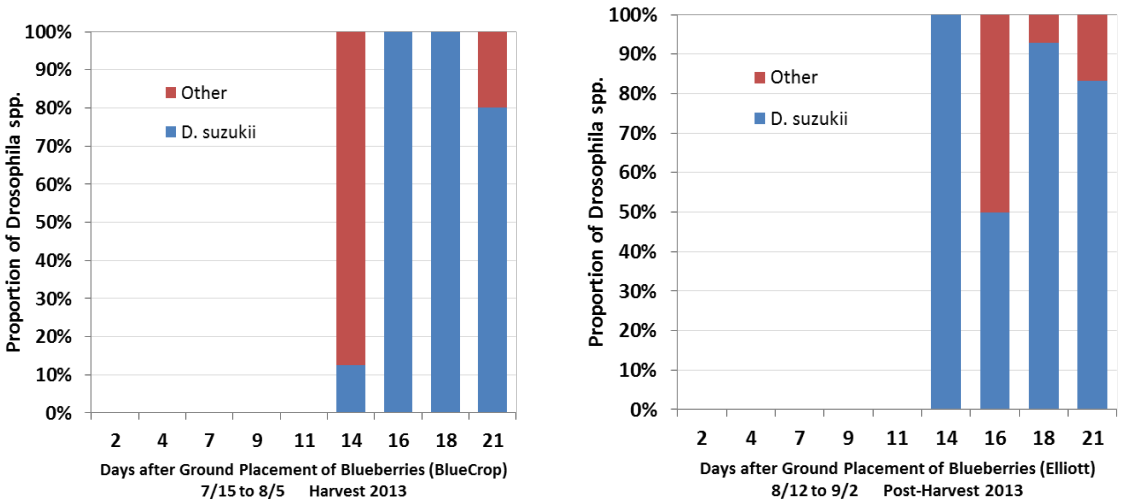

Figure 1. Proportion of SWD larvae (blue) extracted using the sugar method from fallen clean fruit under blueberry plants over two time periods in 2013.

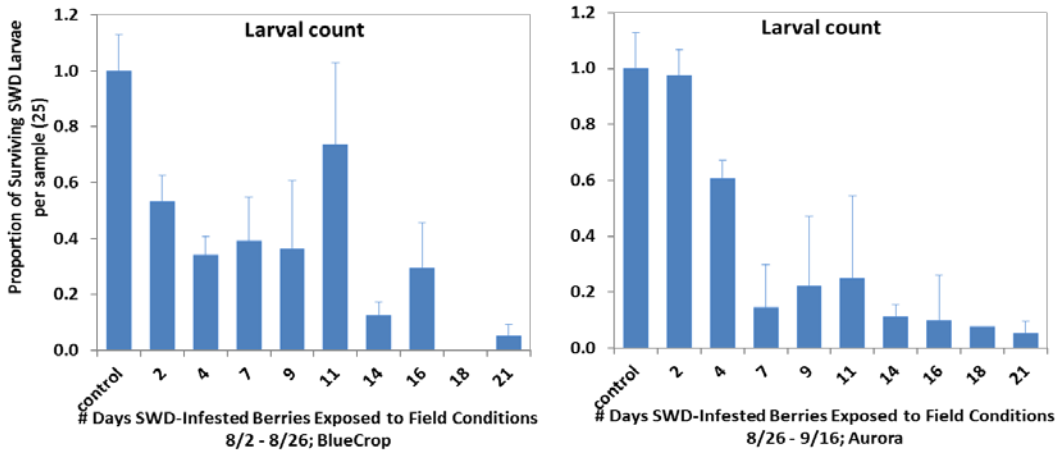

Figure 2. Proportion of surviving larvae extracted over time using the salt method from infested blueberries under drip-irrigated plants over two time periods in 2013.