

FURTHER INVESTIGATION INTO SPOTTED WING DROSOPHILA MONITORING TRAP DESIGN EFFICIENCY

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Previous efforts to discover optimal trapping techniques to adequately monitor spotted wing drosophila (SWD) (*Drosophila suzukii* Diptera: Drosophilidae) during periods of low abundance led to intriguing directions considered worth investigating further. Bait, color, trap height, and trap entrance were variables that could be tweaked to economically and effectively improve detection of the pest of several food crops. Adults can be caught year-round in significant numbers indicating either improved design or a disturbing trend of establishment that may require post-harvest treatments instead of relying on seasonal knockdowns related to weather events.

Traps were placed in or near wild Himalayan blackberry in mid-winter (late-January) and were changed and randomly positioned every week to ten days. Four replicates of red cups with three kinds of entrances and three kinds of baits (nine total per replicate) were initially used among the vines with some additions later involving height and color modifications. Collections of the catches were screened, rinsed and placed in plastic bags to be frozen until counted and sexed under microscope at a later date. Baits included (in approximately 100 mL aliquots): two kinds of apple cider vinegar (Heinz® and either Walmart or Safeway brand), until a consistent advantage was determined; and a diluted (1:1 with water) soy sauce (Kikkoman®) solution. The trap entrances included: two sizes of hardware cloth rectangles glued with hot glue gun, with either quarter-inch or eighth-inch spaced grids, two of same size on opposite sides of 8 ounce Kirkland Chinet® cups (Costco); and ten 3/16th-inch diameter holes poked one inch apart with soldering iron around the same type cup. Entrances were approximately one to two inches below the lid. Black party cups (slightly smaller than the red cups) with similar entrances and baits were eventually added in April, as well as placement of the traps with partial sets of treatments over 10 feet above ground in a Bartlett pear tree and a Douglas-fir tree.

The more expensive Heinz® apple cider vinegar (not the flavored option) was consistently a preferred attractant for the fly over the other brands of vinegar in a three month period, so the latter treatment was discontinued at the end of April (Figure 1). Soy sauce baits were competitive during the same period and were continued throughout the study, although a summer drop-off was observed in the field before a deterministic count was made. The larger quarter-inch entrance trap, conjectured to be more efficient in terms of SWD numbers, was not consistently observed to be definitively any better while collecting, and also allowed for more houseflies and other larger species to get trapped. The larger openings allowed the bait solutions to evaporate faster and often dried out in warmer periods, as observed in earlier years.

Comparisons in the spring among the various locations showed that the higher placed traps generally had more SWD than in the blackberries (Figure 2). The preference for one color over another was not determinate and varied among areas. As observed previously, the black color is often more preferred among blackberries, but there was much variability, and the black traps were not fully replicated. There was a late winter snow that affected catch totals for the ensuing weeks (Figure 3), and a significant surge did not occur until late September as noted in the two previous years.

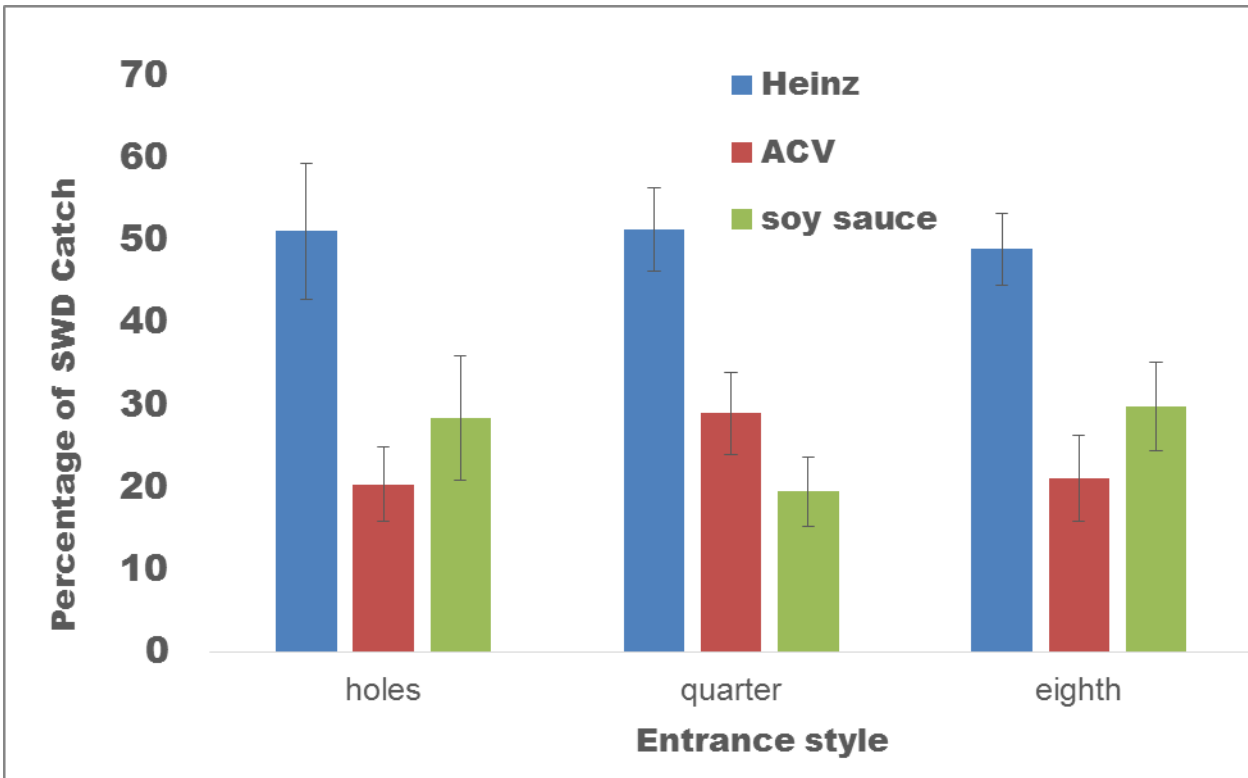


Figure 1. Proportion of SWD catch comparing baits according to entrance (red cups in blackberry).

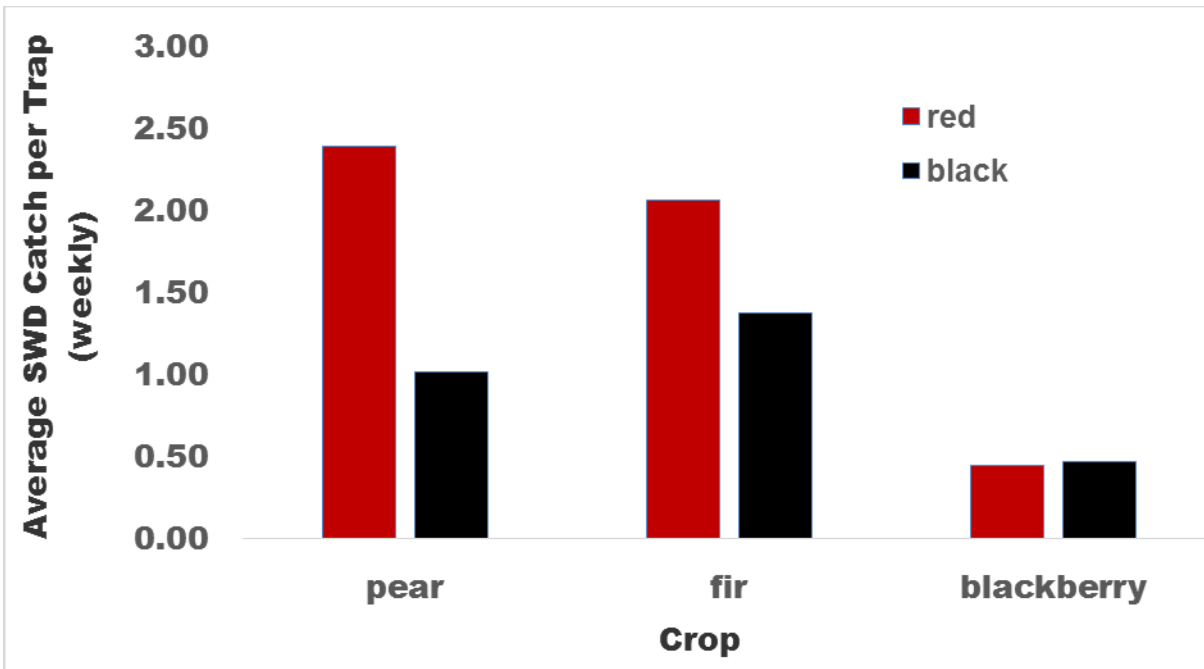


Figure 2. Average catch of SWD among trap locations spring 2012 by trap color.

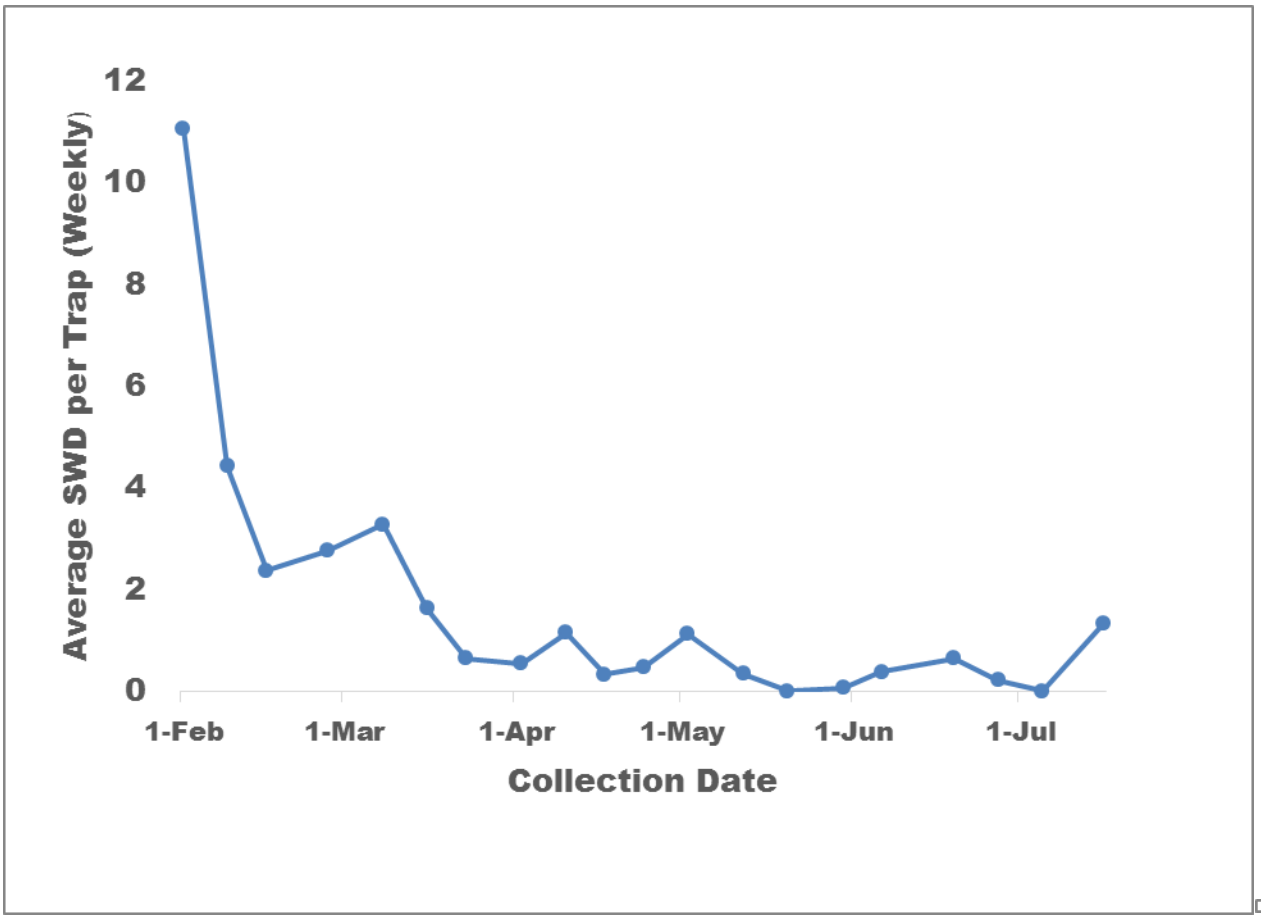


Figure 3. Average SWD catches by collection date in wild blackberry winter-spring 2012