**Seasonal Assessment of Fixed Spray (SSCDS) Application of Apple Pesticides,**

**Fowler Farms 2015**

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 A fixed-spray (Solid Set Canopy Delivery) system was used to apply all the crop protectants (insecticides, fungicides, acaricides) and foliar nutrients required in a section of a commercial apple planting, at the same dates and rates as those applied to the remainder of the orchard using a standard airblast sprayer. The system was constructed in a 1.1-acre section of a super-spindle dwarf (M.9) apple orchard in its 7th leaf, located at Fowler Farms in Wolcott (Wayne Co.), NY. The system plot covers 16 rows comprising 4 varieties in 4-row sets (McIntosh, Gala, Zestar!, Honeycrisp), planted on a 10-ft row spacing with 2 ft between the trees, extending 300 ft down each row. Spray nozzles are supplied by 1" diam polyethylene tubing attached to a support wire above the trees (105" height); single or double microsprayer (9.2 gal/hr) nozzles are suspended on 8" or 28" lengths of tubing reservoirs alternating every 3 ft along the lateral tubing, and are fitted with anti-drip devices. For each application, pesticides mixed in the tank of the airblast sprayer were pumped directly into the system's input manifold at a low pressure, to fill all the tubing reservoirs, and then compressed air at <25 psi was used to push the excess liquid through return lines and back into the tank. Finally, compressed air at 40 psi was used to open the check valves and spray out the solution from the reservoirs into the trees. On each application date, sprays were applied to each of the eight 2-row sections of the system's structure sequentially; after all 16 rows had been sprayed (a process taking 15-20 min for the 1.1 acres), the remainder of the block was sprayed, using the same airblast unit being drawn by the tractor.

 Insect pheromone traps were deployed at the start of the season, in both the SSCDS and Airblast portions of the orchard, to assess the levels of 3 primary lepidopteran fruit pests: codling moth (CM), oriental fruit moth (OFM), and obliquebanded leafroller (OBLR). Two traps per species were hung in the orchard interior, at two locations in the SSCDS section, and were checked weekly from 12 May until 7 September. On 14 September, fruits were examined on the tree for evidence of insect damage and apple scab infection; 200 fruits each of Gala, McIntosh, and Honeycrisp (Zestar! had been harvested at an earlier date) were sampled in each of the treatments and rated for the presence of insect or disease damage.

**Results**

 Insect pressure was generally low in this orchard throughout the season, with few or no captures of CM or OFM, but a moderate level of OBLR was seen (Fig. 1). The results of the fruit inspection revealed no incidences of apple scab using either application method, and extremely low damage from any insects; the only fruit damage found was caused by tarnished plant bug, in the SSCDS treatment (Table 1). Although no untreated check was included to assess the baseline pressure of these pests, these results indicate that the SSCDS application method provided control equivalent to that obtained with an airblast sprayer.

Fig. 1. Captures of fruit-damaging Lepidoptera pest moths in the SSCDS orchard section, 2015.

Table 1. Pre-harvest fruit insect and disease damage to apples receiving seasonal sprays applied using either SSCDS or Airblast application methods, 14 Sept. 2015.

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | Number  | No. damaged by |
| Treatment | Variety | of fruits | OBLR | TPB | Apple Scab |
| Fixed Spray | Gala | 200 | 0 | 3 | 0 |
| Fixed Spray | McIntosh | 200 | 0 | 0 | 0 |
| Fixed Spray | Honeycrisp | 200 | 0 | 0 | 0 |
| Airblast | Gala | 200 | 0 | 0 | 0 |
| Airblast | McIntosh | 200 | 0 | 0 | 0 |
| Airblast | Honeycrisp | 200 | 0 | 0 | 0 |