Advancing IPM for Midwest Apple Production using the Pesticide Risk Mitigation Engine

Since 2006, the IPM Institute of North America has helped over 60 orchardists in Illinois, Iowa, Minnesota and Wisconsin improve their use of IPM strategies through participation in the IPM Institute scouting program, AppleTalk, sprayer calibration, ipmprime.com analysis, TruEarth certification and the USDA Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP). This work has been supported by grower fees; grants from USDA and US EPA Region V; Wescott Agri Products; and NRCS EQIP. The USDA-NRCS supports IPM through voluntary programs with private landowners that protect and enhance natural resources.

Ipmprime.com Documents Pesticide-Risk Reduction

WI Eco Fruit Project
Since 2000, the Wisconsin Eco-Fruit Project has helped growers reduce pesticide risk and apply Integrated Pest Management (IPM). The project supports growers with the resources to learn IPM scouting, monitoring, and sampling techniques. Apple producers receive additional support through participation in the IPM Institute’s scouting program, NRCS EQIP 595 and AppleTalk.

AppleTalk is an innovative weekly IPM conference call where 30+ growers, consultants and researchers participate in an open discussion of the weeks pest phenology and the IPM techniques required to manage the emerging pests.

To create a greater incentive to adopt advanced IPM, a local packing house began developing the TruEarth Certified eco label for their wholesale suppliers. TruEarth developed out of the successful Red Tomato Eco Apple program. The program prohibits the most highly toxic pesticides and uses additional pesticide use restrictions, to minimize pesticide risk. TruEarth certification requires documenting IPM strategies, complying with pesticide use restrictions and passing on-farm and record audits.

Eco-Fruit is a project of a partnership with the Wisconsin Apple Growers Association, the IPM Institute of North America, and the UW-Madison Center for Integrated Agricultural Systems.

Sprayer Calibration: Immediate and Measurable Savings Guaranteed!
In 2012 we calibrated air-blast sprayers in the Upper Mississippi River Valley region of Minnesota and Wisconsin. This work was completed with funding support from the US-EPA Strategic Agricultural Initiative between 2010 and 2012. Tree fruit producers in the region use both the tradition high pressure air-blast sprayer and the low-pressure sprayer produced by AgTec. The calibration results represent 11 orchards and two to three spray scenarios per orchard, for a total of 32 calibration events.

Five Reasons to Calibrate
1. 10-15% of spray material is routinely lost in air-blast applications.
2. Speeds two to three-tenths of a MPH off change sprayer output 5%.
3. Charts that estimate travel speed based on gears are often inaccurate.
4. Our results found tractors with digital speedometers were inaccurate.
5. Nozzle wear of 10% can change spray patterns.

Calibration observations and results:
✓ Over applying water and pesticide to orchard blocks by 52%.
✓ Other frequent observations:
  ▶ Missing/broken pressure gauges,
  ▶ Leaking manifolds, fittings and nozzles,
  ▶ Broken/clogged/missing nozzles.

Recalibration and follow up 2013-2014:
✓ Five growers installed electronic spray-control system, a $2,500 to $5,000 investment;
✓ Nine growers calibrated with assistance from the IPM Institute;
✓ Three orchards calibrated sprayers independently.

What did we find after three years of calibration outreach?
✓ Growers made a consistent 3.5% to 15% improvement in calibration results by 2014 after implementing annual sprayer calibration.
✓ The average over application declined to 9.81% among four sprayers and under application declined to 11.64% in seven sprayers.