

Managing A New Threat to Berry Crops Through Local and Regional Cooperation



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Abstract

Spotted wing drosophila (SWD, *Drosophila suzukii*) was first found in Maine in Fall 2011. This invasive fruit fly, originating in northern Asia, can destroy berry crops and other soft fruits. During Winter 2011-2012 an intensive educational program was initiated to increase grower awareness of SWD in Maine, with efforts supported and enhanced through cooperation with other northeastern programs. New England research and Extension specialists developed a network of monitoring sites, maintained with assistance from farmers and students. Fly population and damage data was shared through a blog, mapping web page and weekly e-mail updates. Management recommendations based on regional research were distributed via newsletter, web page and online videos. Detailed fact sheets on identification, monitoring and management were distributed through a cooperative project with Pennsylvania State University. Although damage has been significant, surveys have shown that most growers were aware of SWD and had access to management information, primarily through Extension. This program's impact in preventing severe economic harm to Maine berry growers could not have been achieved without the expeditious cooperation of Extension and research specialists locally, regionally and nationally.

The Problem: Spotted Wing Drosophila (*Drosophila suzukii*)

- An invasive insect pest of raspberries, blueberries, strawberries, and other soft fruits originally from northern Asia. It arrived on the west coast of the U.S. in 2008. It first appeared in the northeastern US in 2011 and quickly became an important pest of berry crops.
- Similar to *Drosophila melanogaster*, the common fruit fly found around any overripe fruit. Unlike *D. melanogaster*, *D. suzukii* will lay its eggs on fruit before it ripens. Affected fruit become infested with small white maggots just as it is ready to pick. Infested fruit quickly rot and have no shelf life.
- The ovipositor of the female spotted wing drosophila is hard and serrated, unlike most of its *Drosophila* relatives, allowing it to cut into the flesh of unripe fruit to lay its eggs; in excess of 400 per female.



Spotted wing drosophila,
♂ left, ♀ right

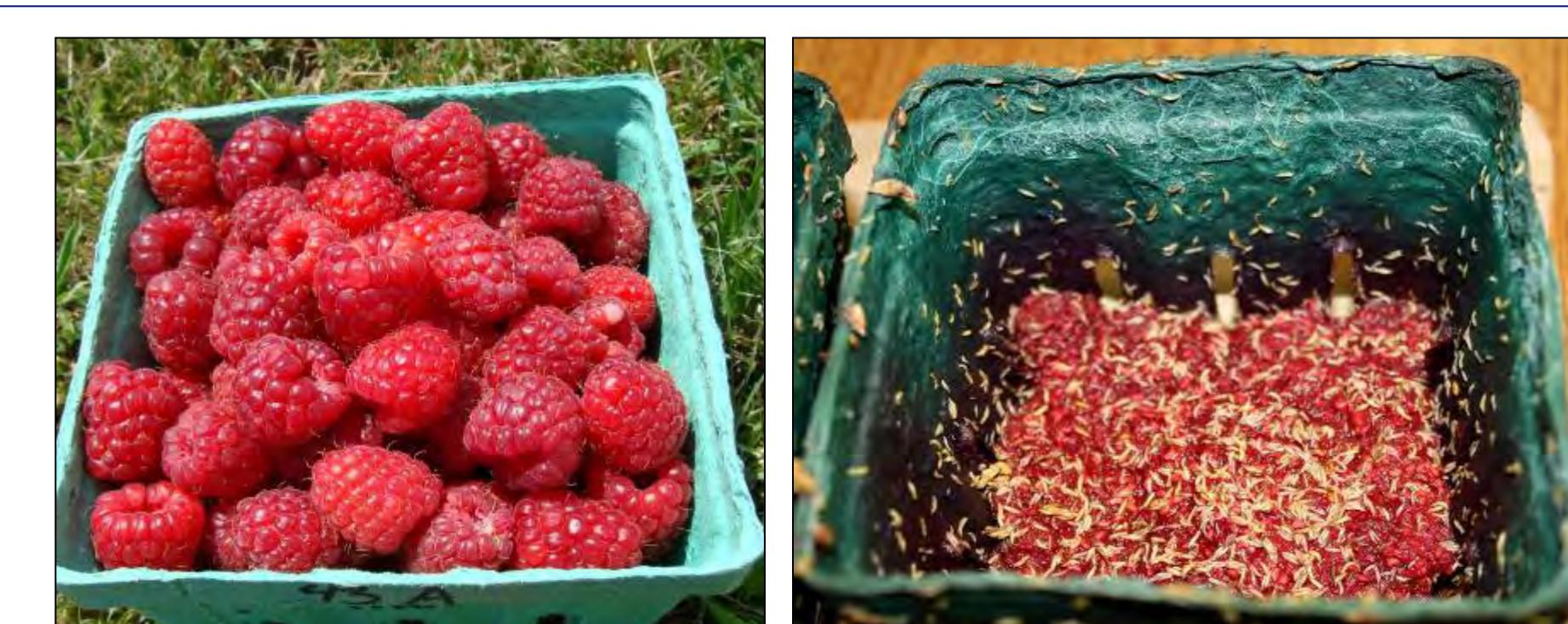


Spotted wing drosophila,
serrated ovipositor

- The flies can complete a generation in under two weeks, thus millions of flies can be present soon after the introduction of just a few into a field.
- It is likely that spotted winged drosophila can successfully overwinter in the Northeast, although it does not build up to damaging levels until summer.
- Controlling this pest is very difficult and frequently repeated insecticide sprays (1 to 3 times per week) may be needed to prevent infestations once the insect is present in a field.



Left: spotted wing drosophila adult ♂
Right: spotted wing drosophila larvae



Left: freshly harvested raspberries, infested
Right: infested raspberries 48 hours post-harvest

The Response: Maine

- Sixteen monitoring sites were set up at volunteer strawberry, raspberry and high bush blueberry farms, and 4 sites in wild blueberry fields.
- Trapping data was shared weekly with over 100 fruit growers through a UMaine Extension blog and e-mail list.
- A YouTube video was produced to introduce the new pest and illustrate how to make a trap.
- Management recommendations were posted on a newly created UMaine spotted wing drosophila web page.
- A statewide grower survey was distributed to determine the impact of this new pest on local berry crops and the effectiveness of Extension programming to address it.



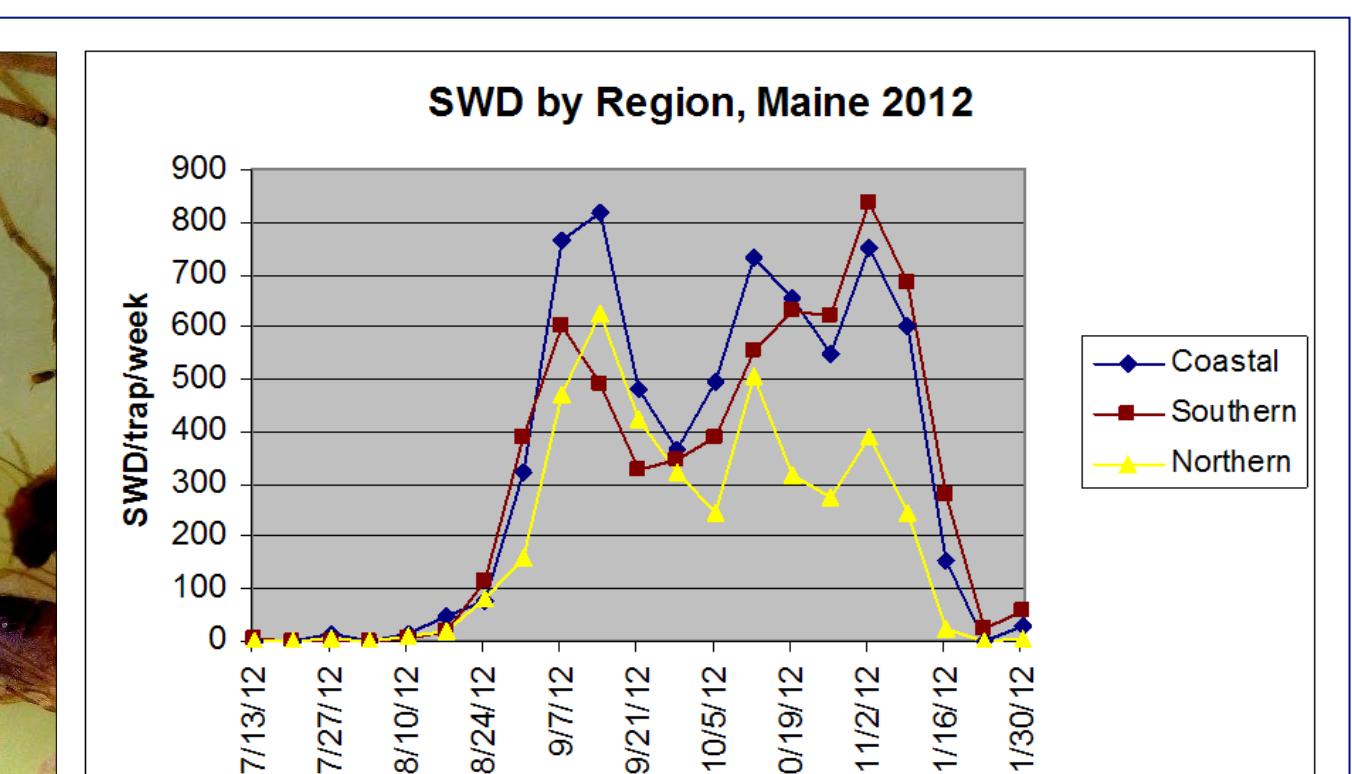
Left: spotted wing drosophila trap monitoring



Right: spotted wing drosophila trap catch, 1 wk



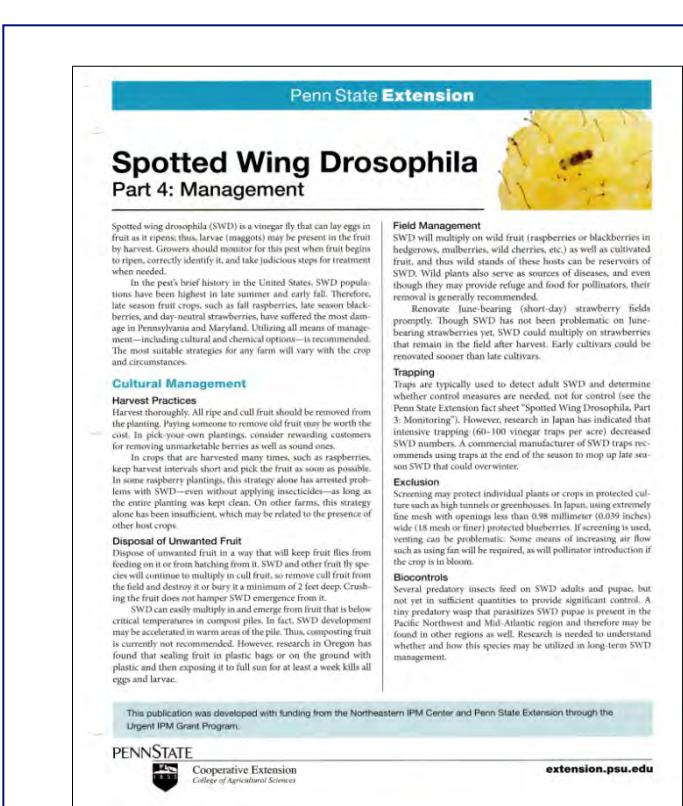
Left: spotted wing drosophila ♂ from trap



Right: seasonal spotted wing drosophila counts

The Response: Regional Cooperation & Coordination

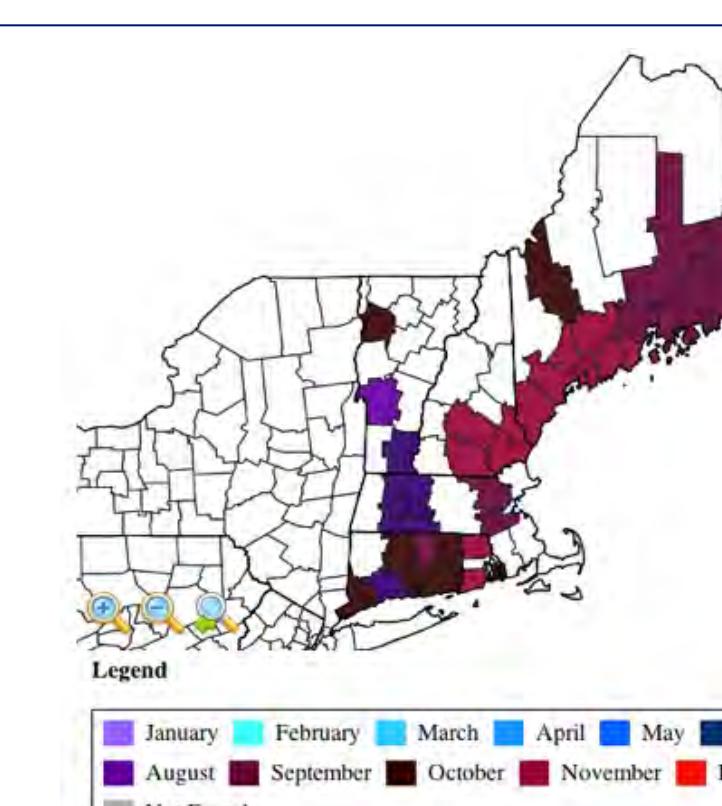
- Weekly teleconferences of northeast small fruit Extension and research staff, hosted by Cornell University, to provide updates of spotted wing drosophila monitoring data, management efforts and preliminary research results.
- Standardized monitoring protocol developed with six New England States
- Regional reporting system developed to map infestation levels throughout the region over the season
- Regional grower survey to determine extent of damage, grower understanding of the problem, management effectiveness, and impacts of Extension outreach
- Regionally funded fact sheet series produced on spotted wing drosophila by Penn State



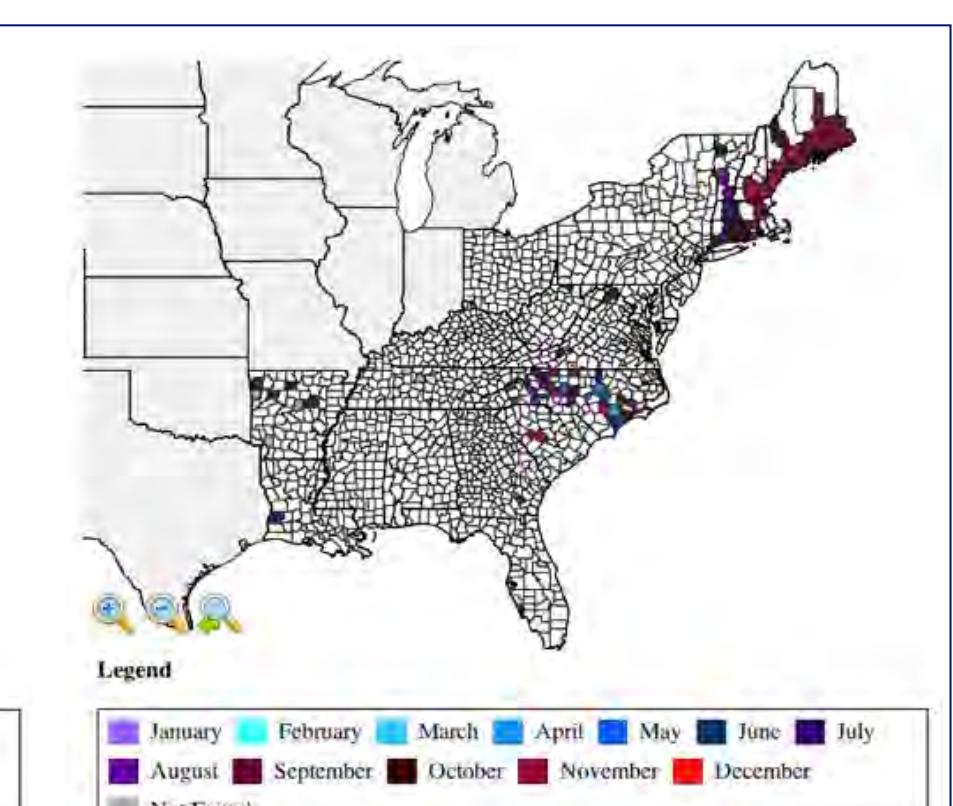
Left: regionally sponsored fact sheet (Penn State)



Right: New England standardized trap design



Left: local mapping of spotted wing drosophila



Right: regional mapping of spotted wing drosophila

Early Impacts (2012 Season)

- In Maine, over 75% of growers surveyed received spotted wing drosophila information from Extension sources
- In the Northeast, over 35% of growers surveyed used traps to monitor spotted wing drosophila
- Over 40% of growers surveyed used a recommended cultural practice to reduce drosophila infestation
- Over 50% of growers surveyed used Extension information to make management decisions

Conclusions

- Most commercial berry growers received timely spotted wing drosophila information from Extension sources
- Many of those receiving spotted wing drosophila information from Extension in the first year of its appearance used it to monitor and manage this pest.
- Regional cooperation greatly enhanced the quality and quantity of Extension information that was quickly available in response to this new threat to berry crops in Maine.