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Spotted lantern fly, a new pest from Asia

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EFFICACY AND LONGEVITY OF DINOTEFURAN BARK SPRAYS TO CONTROL THE SPOTTED LANTERNFLY

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ABSTRACT

An infestation of spotted lanternfly (*Lycorma delicatula*) was detected for the first time in the United States in late 2014 in eastern Berks County of southeastern Pennsylvania. The infestation is currently known to be present on hundreds of properties within 6 counties, with the heaviest infestations centered on the initial point of detection. Recent finds in new municipalities continue to be located adjacent to existing quarantine locations. The strategy to eliminate this pest is multifaceted and includes the following: establishment and enforcement of quarantines, intensive surveys using tree sticky bands, various research efforts (host range, trapping), outreach and extension activities that include volunteer efforts (egg mass scraping and tree banding), and chemical control.

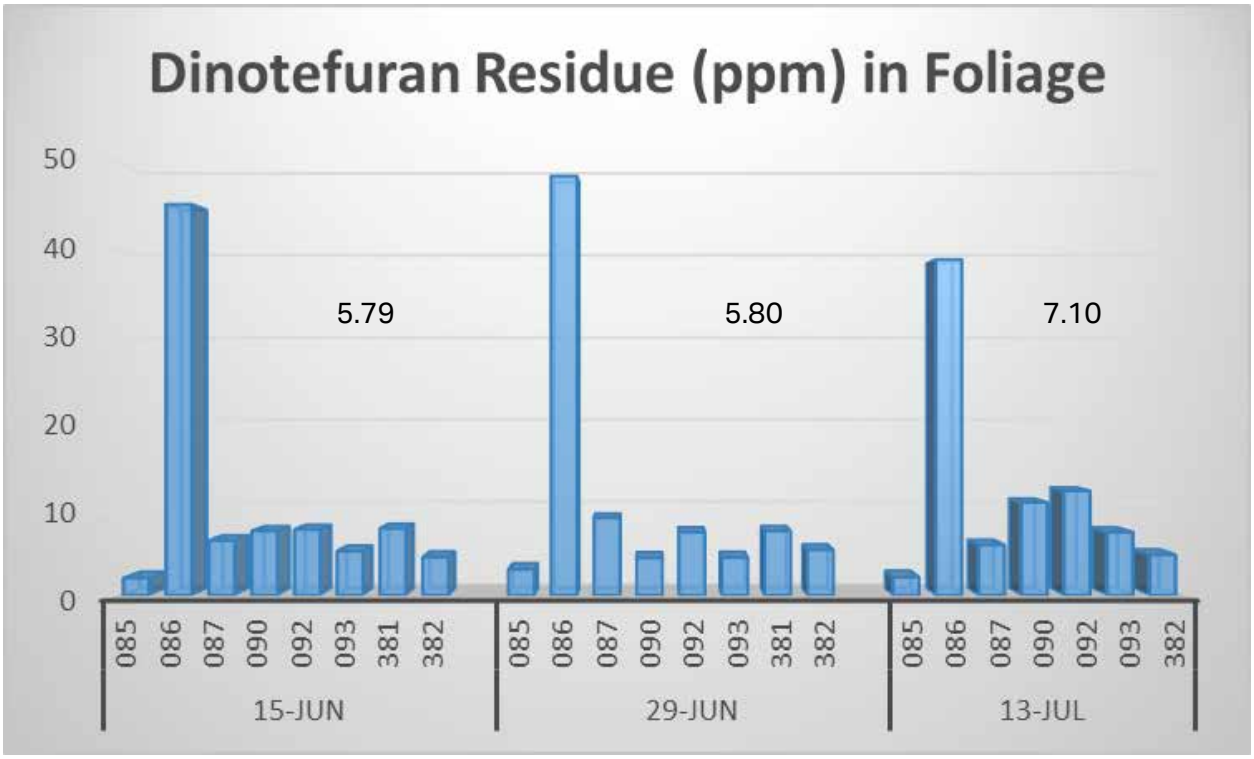
Tree of heaven (*Ailanthus altissima*) is a key host where all life stages of the insect congregate. Prior to the 2016 field season, seventy-five parcels of land were identified and cleared of *Ailanthus*, except for several trees on each parcel that were retained as trap trees. Treatment of trap trees began in late May, 2016 using a bark spray application to the lower portion of the tree trunk using a systemic insecticide (dinotefuran, Transtect 70 WSP).

Observations of these trees during the summer verified that the treatments were quite effective, with dead lanternfly nymphs and adults readily found beneath treated trees. There is a concern, however, about proper timing and continued efficacy of the treatments considering EPA label restrictions of one application per year and that adults are active between mid-July and a hard frost (December or later in Pennsylvania, depending on the year). Tree foliar residues of dinotefuran can be readily detected using a commercially available ELISA kit. Foliage samples were collected between mid-June through October and were processed and analyzed in the lab to quantify dinotefuran residue. The majority of samples were collected from trees treated in late May to early June. Samples were also collected from a few trees that were treated in late in the fall and from trees that had been treated at ½ of the maximum labeled rate.

Dinotefuran residue was determined for all foliage sample collections, even in late October when leaf senescence was beginning to occur (Figure 1). There was a decrease in residue detected over time, with the collections in September and October differing from both of the June and the July samplings (One-Way ANOVA p=0.003; Tukey HSD Q=4.33). Spotted lanternfly nymphs and adults were sensitive to the pesticide applications, with abundant cadavers present throughout the summer and fall; poisoned adults exhibited wing-flaring while resting on the tree trunks (Figure 2). Trees treated with a fall bark spray application had minimal to low levels of dinotefuran.

Future plans for this work will investigate treatment timing and efficacy of a ½ rate application and a tank mixture of dinotefuran and imidacloprid. The goal is to provide the eradication program with data to determine the longevity and efficacy of the treatments so that optimal timing and impact of the applications is achieved.

Figure 1. Dinotefuran residue detected in *Ailanthus* foliage over time. Numbers above the bars are the average residue value for all of the trees for each date, but excluding tree 086.



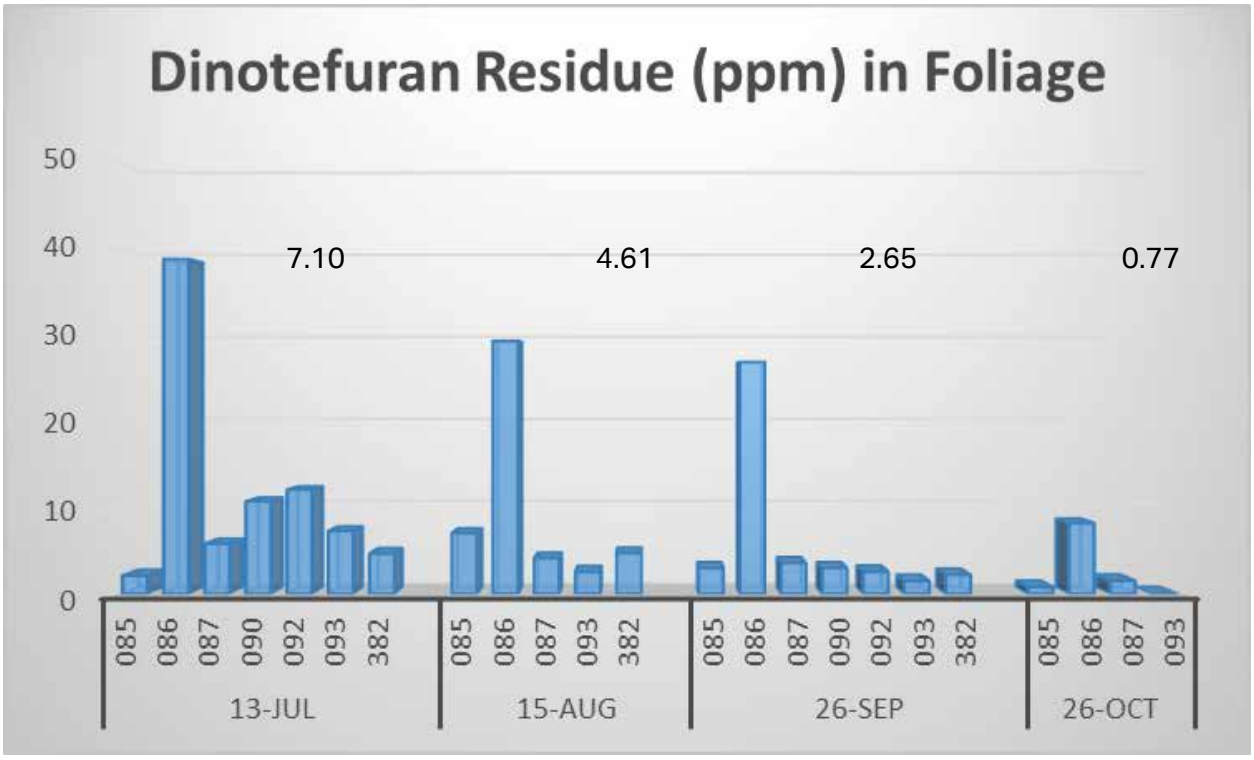


Figure 2. Adult mortality is evident from this picture of a treated tree in August. Wing-flaring of adults indicates pesticide poisoning.