

Refinement of Plum Curculio Biology in Southern New Jersey Peaches

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Plum curculio (PC) is a pest of apple, plum, peach, cherry, and blueberry, and can cause significant crop losses through early season scarring of the fruit (Fig 1). Untreated peach blocks at Rutgers Agricultural Research and Extension Center (RAREC) in Bridgeton, NJ can have >90% injury through scarring, direct fruit loss, and larval contamination of the fruit. Depending on geographic location, PC has two distinct populations that vary in the number of generations per year and are distinguishable through DNA analysis. The southern population has multiple generations per growing season, which can result in live larvae contaminating peaches at harvest. Regardless of location, only first generation

PC impact apples, they cannot develop in apples later in the growing season.

Beginning in 2012, we have found live PC larvae in harvested peaches at RAREC and observed continual adult activity, which strongly indicates the presence of a second generation. We conducted molecular analysis for 83 specimens from 2016 peaches at RAREC. Using an IQ tree analysis, all 83 specimens align with the southern plum curculio population. This confirms that the southern strain of PC is present in New Jersey for the first time.

The presence of the southern strain alone does not change the risk posed by PC, however, if a second

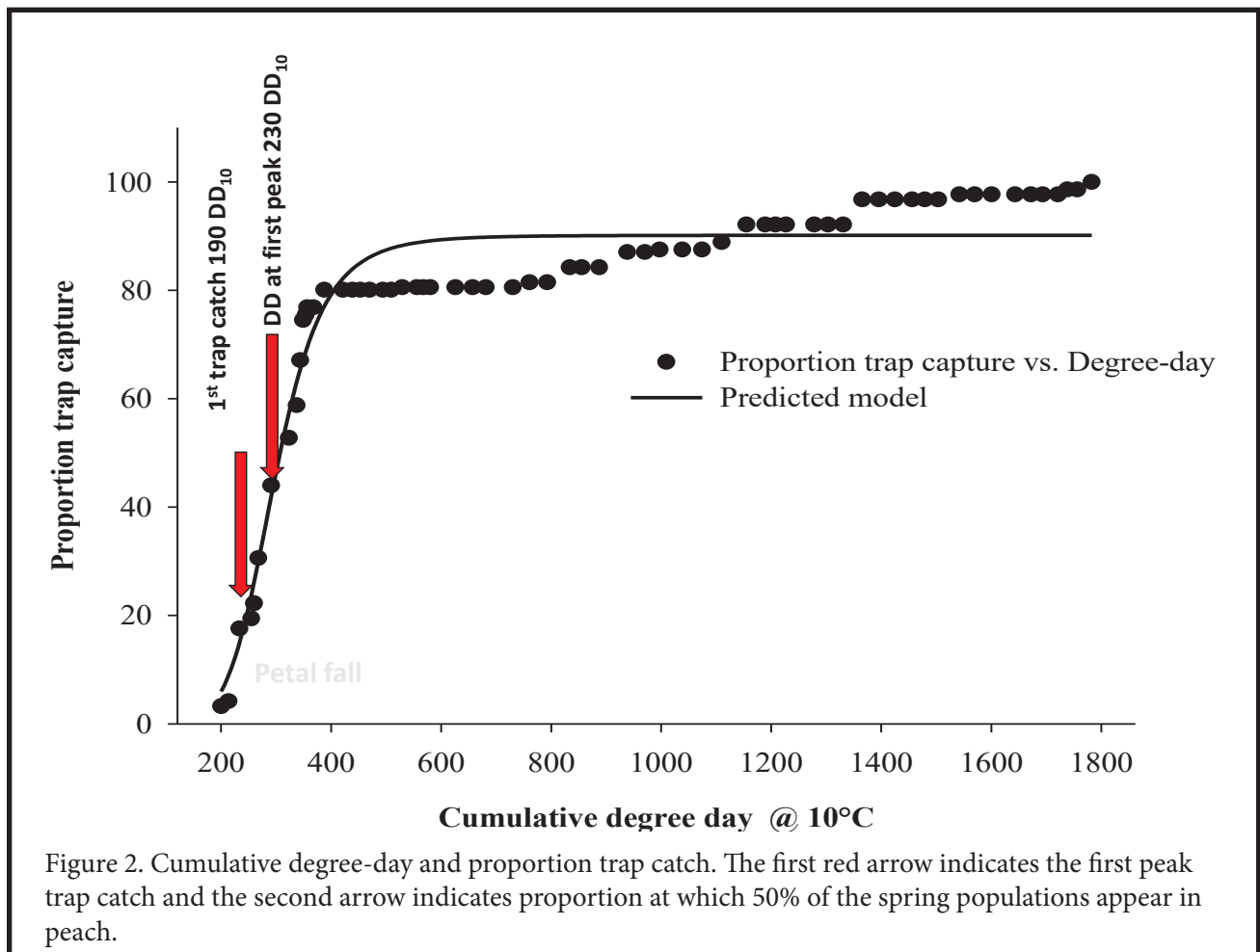




Figure 1. Plum curculio adult.

generation exists it could impact management programs and increases the risk of fruit with live worms at harvest. In recent years, growers have ap-

plied 3-4 insecticides against PC in the spring due to prolonged activity of adults. Growers and extension professionals have no IPM tools for determining when to start spraying or when to stop spraying in NJ peaches. We applied historic weather station data to seasonality data and compared the two degree-day models for best fit. The degree-day model developed for southern

peaches best fits the PC population in Bridgeton, NJ. The model predicts PC movement into orchards at 190 DD_{100C} and that if PC is present, insecticide applications should start at 220 DD_{100C} (Fig. 2). There are also sufficient degree-days for the development of two generations in Bridgeton, NJ.

In 2017, 8.6% of nectarines harvested from a lightly treated block at RAREC had live PC larvae in them at harvest in 2017. In contrast, previous work by Anatas Atanassov (Rutgers Fruit IPM program) for Northern New Jersey showed the degree-day model for apples fit well with that population (genetic analysis still pending). This suggests that we may need two different degree-day models in NJ to make management decisions for PC.

Editor's Note: I asked Dr. Neilson if she had more information on where the two strains of PC might diverge and if we had just the Northern Strain of PC in Northern NJ? Her response was: "Regarding PC, we aren't entirely sure where the populations would separate. We have a few specimens from additional farms in NJ that hopefully will help clarify this question. research considerably."

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