Section IV: Field Crop Pests

**SOAK OR SPRAY: CONTROL OF POLYDRUSUS IMPRESSIFRONS ON UN-ROOTED HYBRID POPLAR CUTTINGS**

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Hybrid poplars are an irrigated perennial monoculture propagated by un-rooted branch cuttings. Leaves emerge during May and June, roughly two weeks following planting. Adults of the European species *Polydrusus impressifrons* (Coleoptera: Curculionidae) emerge and begin feeding on new leaf growth of hybrid poplars, and other nearby crops, starting in mid-May through late June. This pest has caused significant crop loss (cutting mortality, yield reduction, and stem malformations) on the Boardman Tree Farm (BTF) since 2010. Since first noted on the farm in 2004 *P. impressifrons* has continued to expand its distribution across BTF. Roughly 3,500 acres are treated annually for this pest with a fixed-wing aircraft. While quick and ultimately effective, this type of treatment leads to a large portion of the insecticide landing on bare ground and not the relatively small surface area of an emerging leaf. Previous studies have shown that soaking cuttings in an imidacloprid solution for 24-48 hrs has reduced *P. impressifrons* herbivory and increased first year growth. The objective of this study was to evaluate the efficacy of three techniques (soak, spray and load) to protect new cuttings from *P. impressifrons* herbivory.

This study examined two hybrid poplar clones (BC-79 & BC-82) that GreenWood Tree Farm Fund has deployed in their biomass plantings on BTF. Biomass stands are planted at a density of ~1,500 stems per acre, with each cutting being placed at an emitter along the drip tube. Planting material is gathered from nursery stands during January and February of the planting year and held in cold storage until planting in late-April and May. The soak treatment was initiated 48 hrs prior to planting in a solution of Admire Pro® (5.25 fl oz./ac). The spray treatment consisted of Coragen® (3 fl oz./ac) applied by backpack sprayer approximately one week following leaf flush. The load treatment consisted of Admire Pro® (5.25 fl oz./ac) applied in August of the previous year to the nursery stock via chemigation. Cuttings of each treatment (48 hr soak, 24 hr soak, load, spray & control) were hand planted the first week of May in a Latin Square design in Stand #805-4 at BTF. Leaf bunches and *P. impressifrons* adults were collected for no-choice feeding assay on 22 May 2014. These no-choice feeding assays were evaluated 48 & 96 hrs following initiation. Data collection and analysis was conducted by WSU Franklin County Extension Service.

Results indicate that spray and soak treatments had more *P. impressifrons* mortality than either the control or load treatments at both sampling times (Figures 1 & 2). These results also indicate
that mortality increased over time across all treatments. Mortality in the spray and soak treatments were not significantly different at either sampling periods. This indicates that both these control techniques provide equivalent control of *P. impressifrons* on new cuttings in the hybrid poplar system.

While a spray or soak application may have the same efficacy on controlling the target pest, each treatment has its own challenges for the Boardman Tree Farm. Spray treatments generally result in a majority of pesticide not reaching the targeted new cutting leaves during this time of year. While soaking 500,000 cuttings presents logistical challenges (space, timing, worker exposure) to the grower, but does ensure that the pesticide is only applied to targeted area. It is likely that the Boardman Tree Farm will incorporate both of these control techniques into their pest control program based on these results.

![Figure 1](image-url)

**Figure 1.** Results of no-choice feeding assay of hybrid poplar clone BC-78. *Polydrusus impressifrons* adults were placed in 16 oz. deli cups with small terminal branch of a new cutting. Spray = Coragen® (3 fl oz./ac), 24 & 48 hr Soak = Admire Pro® (5.25 fl oz./ac) & Load = Admire Pro® (5.25 fl oz./ac).
Figure 2. Results of no-choice feeding assay of hybrid poplar clone BC-82. *Popladrus impressifrons* adults were placed in 16 oz. deli cups with small terminal branch of a new cutting. 
Spray = Coragen® (3 fl oz./ac), 24 & 48 hr Soak = Admire Pro® (5.25 fl oz./ac) & Load = Admire Pro® (5.25 fl oz./ac).