

Beet Leafhopper and BCTV Strain Survey

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Screening for resistance to Beet curly top virus (BCTV) in sugarbeet both in the field and with agro-inoculation clones in the greenhouse suggests that at least some sources of resistance are strain-specific. Also, beet leafhopper populations can vary by location and year. Thus, at the request of a sugarbeet industry stakeholder, beet leafhopper populations in southern Idaho were tracked during the 2020 growing season in desert areas and sugarbeet and dry bean fields in four southern Idaho counties. Samples were collected on a weekly basis from May through mid-September to assess all leafhoppers for population levels and the presence of BCTV strains. Crop plants from monitored fields were also assessed for the presence of BCTV strains. The project will establish the BCTV strains for which host plant resistance is needed and the time frame for when control of beet leafhoppers is necessary.

Elmore County had green plants in the desert coming out of the winter and through the summer. Beet leafhopper populations in Elmore County were present in at least double-digit numbers through most of the summer at all three sites. However, populations peaked in the Elmore desert (avg. 401 beet leafhoppers per 40 sq. inches) on 20 May, while populations in the bean field peaked in late Jun to mid-Jul (avg. 24) and the sugarbeet field on 5 Aug (avg. 69).

Coming out of the winter, the desert sites in Minidoka and Twin Falls counties were dry and had no green plants, but in late May rains provided sufficient moisture to establish weeds over the summer. In the Twin Falls County desert, the beet leafhopper populations were low (high was an avg. of 3 in Aug) throughout the season. While the Twin Falls County sugarbeet field peaked with an average of 27 beet leafhoppers on 22 Jul and the bean field peaked with an average of 4 beet leafhoppers on 15 Jul. The weeds surrounding the edge of the sugarbeet field appeared to be the primary source of beet leafhoppers in Twin Falls County. In Minidoka County only a few beet leafhoppers were collected at all three sites late in the summer. In Bingham County beet leafhoppers at the desert and sugarbeet sites were almost undetectable through the whole season. However, the Bingham County bean field had an average of 23 beet leafhoppers by 26 Aug.

Given the low number of beet leafhoppers in the other Bingham County sites, the weeds surrounding the bean field appeared to be the primary source of beet leafhoppers. Most plants at the edge of the Bingham bean field and the Twin Falls sugarbeet field had curly top symptoms and a few of the beans appeared to have died from curly top infection. Preliminary data suggest other notable leafhopper populations were *Cicadellidae* sp. in Bingham County desert (avg. 33) and beans (avg. 3) on 3 Jun. The *Cicadellidae* sp. were also present on 13 May in Elmore County desert (avg. 27) and sugarbeets (avg. 4). On 17 Jun, Bingham County also had *Empoasca* sp. peak in sugarbeet (avg. 22) and desert (avg. 14) areas. Preliminary data suggest other leafhoppers collected during 2020 included: *Balclutha* spp., *Ceratagallia* sp., *Chlorotettix unicolor*, *Deltocephalus* sp., *Dikraneura* sp., *Euclidius variegatus*, *Gliridonus nigridens*, *Hecalus viridis*, *Macrosteles quadrilineatus*, and *Psammotettix* sp.

More notable populations and leafhopper species are likely to be added to this list as work progresses. Preliminary data suggest two haplotypes (based on cytochrome oxidase gene) were dominant in the beet leafhopper population. Over the 19-week collection period, the horizontal card averaged 75% fewer beet leafhoppers than the vertical card. The BCTV strain and phytoplasma identification is currently a work in progress.



Photo. Beet leafhoppers on yellow sticky card deployed in Elmore County for one week in early August. Photo credit: Carl Strausbaugh.