



Volume 46, Issue 1

February 2017

Response of *Pemphigus betae* (Hemiptera: Aphididae) and Beneficial Epigeal Arthropod Communities to Sugarbeet Plant Density and Seed-Applied Insecticide in Western Nebraska

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Environmental Entomology, Volume 46, Issue 1, 1 February 2017, Pages 107–117,

<https://doi.org/10.1093/ee/nvw157>

Published: 08 February 2017

Article history: Received: 22 June 2016

This study investigated the impact of a neonicotinoid seed-applied insecticide (Poncho Beta) and two plant densities (86,487 and 61,776 plants per hectare) on the sugarbeet root aphid (*Pemphigus betae* Doane), beneficial epigeal arthropods, and selected crop yield parameters in sugarbeet (*Beta vulgaris* L. var. *vulgaris*).

Ground beetles and centipedes were the most commonly collected taxa during 2012 and 2013, respectively. Centipede, spider, and rove beetle activity densities were not affected by the seed-applied insecticide, whereas plant density had a marginal effect on centipede activity density during 2012. Ground beetle species richness, diversity, and evenness were also not impacted by the seed treatments. However, during 2013, ground beetle activity density was significantly higher in plots planted with untreated sugarbeet seeds due to the abundance of *Bembidion quadrimaculatum oppositum* Say. Sugarbeet root aphid populations were significantly higher in the untreated plots during both years. In 2012, sugarbeet tonnage and sugar yield were higher under the low plant density treatment, while higher sugar content was recorded from the seed-applied insecticide plots (2013). Seed-applied neonicotinoids and plant density had little impact on beneficial epigeal arthropod activity density. Seed treatment did result in decreased root aphid populations; however, these reductions were not sufficient to be considered as an adequate control. This limited aphid control likely contributed to inconsistent effects on yield parameters.

Issue Section:

[Pest Management](#)

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Environmental Entomology, Volume 46, Issue 1, 1 February 2017, Pages 118–124,
<https://doi.org/10.1093/ee/nvw143>

Published: 08 February 2017

Issue Section:

Physiological Ecology

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Volume 46, Issue 1

February 2017

ISSN 0046-225X

EISSN 1938-2936