

## Wildlife Research Information Brief

### Grassland Wildlife Exposure to Soybean Aphid Insecticides on Public Lands

#### Research Summary

Foliar-application insecticides (chlorpyrifos, lambda-cyhalothrin, bifenthrin) are commonly used to treat soybean aphids in Minnesota but we have little information on exposure of free-ranging wildlife to chemical drift from spraying events. During summer 2017 and 2018, we sampled 5 treatment and 4 control sites in the farmland region to assess direct and indirect exposure of grassland wildlife to drift and the indirect impacts on their invertebrate food resources. We detected chlorpyrifos deposition in grasslands at all distances examined (0-400 m from soybean field edge) at both treatment and control sites, suggesting drift was ubiquitous on the landscape. Drift was greater near field edges than the grassland interior at treatment sites. We also found higher residue amounts on mid-canopy samples than ground-level samples. We detected chlorpyrifos residue amounts on arthropods that were below the acute oral LD<sub>50</sub> values for common farmland bird species; however, residue amounts were above the contact LD<sub>50</sub> for honey bees up to 25 m from the field edge. We found short-term reductions in overall arthropod abundance, bird prey abundance (specifically, individuals in the orders Araneae, Coleoptera, Lepidoptera larvae, and Orthoptera), and Coleopteran family richness in treatment sites but our other arthropod measures (i.e., biomass, richness of several other families) did not differ between treatment and control sites post-spraying.

#### Management Recommendations

Our results suggest grassland wildlife can be exposed directly and indirectly to drift from foliar-application insecticides. Furthermore, reductions in arthropod food abundance may impact breeding grassland birds, their young, or other insectivorous wildlife up to 21 days after spraying operations in the area. To reduce impacts of drift, natural resource managers should consider:

- Minimizing the perimeter-to-area ratio of grasslands. Acquiring and maintaining larger grassland tracts will help reduce edge effects of insecticide drift and provide refugia for arthropods to be able to recolonize affected areas.
- Using seed mixes and management techniques that create a thicker, more diverse canopy cover to reduce the amount of drift reaching mid-canopy and ground-dwelling wildlife.

#### Additional Resources

This research was completed by Katelin Goebel, University of Minnesota (Twin Cities), as part of her Master's degree. For more information, contact Dr. Nicole Davros, Farmland Wildlife Research Supervisor, at [Nicole.Davros@state.mn.us](mailto:Nicole.Davros@state.mn.us), or view past Research Summaries under the "Habitats" tab [here](#).

