Insecticide Resistant Alfalfa Weevils in the Western U.S.: Quantifying the Scope of Resistance & Implementing a Plan to Manage the Threat

Kevin Wanner, Montana State University
Ian Grettenberger, University California Davis
Erika Rodbell, Montana State University
Madison Hendrick, University California Davis

Pest resistance to pesticides is estimated to result in economic losses totaling $1.5 billion annually in the US (Pimentel 2005). Alfalfa weevil is the key insect pest of alfalfa grown nationally, where it causes yield loss and reduced forage quality. Recent field reports of failure of pyrethroid insecticides to control alfalfa weevil and increasing damage by this pest in the western region is concerning. Pyrethroid active ingredients form the basis of the most commonly used commercial formulations for alfalfa weevil control due to their effectiveness, safety and affordability, an few alternatives are available. This research and extension project has confirmed pyrethroid-resistance in alfalfa weevils (Rodbell and Wanner 2021), determined the magnitude and extent of resistance in the western US, demonstrated cross-resistance between type I, but not type II, pyrethroids and delivered insecticide resistance management (IRM) recommendations to stakeholders based on laboratory and field data.

References:

Pimentel, D. Environmental and Economic Costs of the Application of Pesticides Primarily in the United States. *Environ Dev Sustain* 7, 229–252 (2005).

Erika A Rodbell, Kevin W Wanner. First Report of Alfalfa Weevil (Coleoptera: Curculionidae) Resistance to Lambda-Cyhalothrin in Montana. *Journal of Economic Entomology*, Volume 114, Issue 5, October 2021, Pages 2088–2095.