

2018 USAFRI Research Project Objectives

Integrated Pest Management of Weevils 2019 Washington State University - Walsh

Project Award: \$17,095

Justification:

- In the recently completed Pest and Pollinator Management Strategic Plan for Alfalfa Seed Production in the Western U.S. industry stakeholders identified the research needs they deemed most critical. Among the highest priorities was: monitoring for pest resistance to insecticides, miticides, fungicides, and herbicides.

In my research on alfalfa produced for seed we have seen slippage in the efficacy of the organophosphate insecticide chlorpyrifos in control of alfalfa weevil *Hypera postica* (Coleoptera Curculionidae). In a unique alfalfa growing area of Washington State we have observed complete field failure of alfalfa weevil control with the pre-mix insecticide Cobalt™. Cobalt is an insecticide marketed by Corteva™ Agrisciences and it is a mixture of the organophosphate chlorpyrifos and synthetic pyrethroid lambda-cyhalothrin. It was alarming to see the field failure with this product. This failure was not unique to a single grower. It was observed in multiple fields in an area of Klickitat County near Goldendale, WA. Goldendale is a small city roughly 100 miles east of Portland, OR. The elevation is about 1,350 feet and it lies in the transition between wet western WA and dry eastern WA. Most growers do irrigate, but a substantial portion of the growers do not irrigate and rely exclusively on rain. Historically much of the hay was shipped to Tillamook, OR but recently most of the alfalfa produced in the area stays local for cattle feed.

Alfalfa weevil overwinter as adults in field trash or other secluded hiding places and emerges in late winter or early spring. Soon after emergence and mating, the adult females begin inserting their eggs into the alfalfa stems. Hatching larvae make their way up the stem to feed on alfalfa terminals and drop to spin a cocoon and pupate by early summer. This species generally has only one generation a year. Young larvae damage alfalfa by feeding on terminal buds; larger larvae feed on the leaflets. Feeding by older larvae is the most damaging and is characterized as skeletonization and bronzing of the leaves in spring. In the fields near Goldendale, WA severe pressure from high populations completely defoliated fields on the second cutting. We propose to conduct studies to determine the resistance status of alfalfa weevils to insecticides in multiple growing regions of Washington State including both forage and seed alfalfa fields.

Objectives:

- The objectives of this project are to 1) Test selected field populations of alfalfa weevil from a representative sample of alfalfa seed fields and compare their dose response curves to insecticide naive populations from alfalfa forage fields on the WSU IAREC campus; 2) Conduct insecticide efficacy trials for weevil control in a commercial forage alfalfa field near Goldendale, WA, and in a WSU-managed field near Prosser, WA; and 3) Disseminate educational outreach materials to alfalfa seed and forage alfalfa growers and other stakeholders.