

## 2020 USAFRI Research Project Objectives

### Efficacy of Residual Herbicides for Weed Control and Reducing Weed Impacts on Alfalfa Yield and Quality University of Idaho - Adjesiwor

Project Award: \$37,966

#### Justification:

- Annual weeds can impact the economics of alfalfa production by reducing forage quality or by contaminating alfalfa hay with unwanted seeds. Weed control programs in alfalfa rely heavily on the ALS-inhibiting herbicides, Raptor® and Pursuit®, for conventional alfalfa and glyphosate in Roundup Ready® alfalfa. Populations of common waterhemp, Palmer amaranth, and kochia are currently resistant to both ALS-inhibiting herbicides and glyphosate, and these resistant weed populations are widespread across much of the United States. Consequently, alfalfa producers do not have many effective options for controlling herbicide-resistant weed populations.
- In row crops, many farmers have shifted to using overlapping residual herbicide programs to control resistant weeds as effective herbicide options become scarce. The herbicides Chateau® (Group 14), Warrant® (Group 15), and Prowl® H2O (Group 3) are all labeled in alfalfa. All three herbicide options provide effective control of pigweeds, Palmer amaranth, and waterhemp, and have some activity on kochia. In row crops, residual herbicides are used to provide weed control from planting until canopy closure. There has been considerable research in row crops regarding the optimal timings of residual herbicides, however, there is a lack of information on the optimal timing of these herbicides in alfalfa. Alfalfa is a competitive crop, but with every cutting, there exists an opportunity for annual weed emergence once the canopy is removed.
- As extension professionals, we have fielded many calls from growers regarding what herbicide to use in alfalfa for the control of herbicide-resistant weeds. While we can point producers to Chateau® or Warrant® as a potential solution, we do not have good information on optimal timing or the longevity of residual weed control. What growers want to know is when should a residual herbicide be applied, how many cuttings will a particular product last, and can season-long weed suppression be expected from a single application. To answer these questions, we are proposing to compare the use of residual herbicides for control of herbicide-resistant kochia, common waterhemp, and Palmer amaranth in alfalfa. Our ultimate goal is to provide alfalfa growers science-based guidelines on (1) when to apply residual herbicides and what level of control to expect, and (2) the impacts of herbicide-resistant weeds on alfalfa yield and quality.

#### Objectives:

- The objectives of this project are to 1) evaluate herbicide programs and application timing for control of herbicide-resistant weeds; 2) determine the impact of weed control on alfalfa hay yield and quality; and 3) extend research results to stakeholders through field days, workshops, and extension publications.