

Exercise 8: Developing a Proactive Herbicide Resistance Plan

Herbicide resistant weeds are a major problem in agronomic cropping systems worldwide. A common recommendation from university and industry weed scientists is to incorporate multiple herbicide modes of action to proactively manage herbicide resistant weeds (i.e. prevent or herbicide resistance from occurring). Recent research indicates the optimal way to prevent the increase in herbicide resistant weed biotypes is to tank-mix multiple herbicide modes of action, or at the very least utilize multiple modes of action within the same crop year. In this exercise, the class will develop herbicide recommendations that will be optimally effective at proactively managing herbicide resistant weed biotypes.

The field for which you are providing a herbicide recommendation contains the following weeds:

- kochia
- common lambsquarters
- velvetleaf
- redroot pigweed
- common cocklebur
- barnyardgrass
- green foxtail

The field is in a region where the following crops are economically viable options:

- corn
- soybean
- sugarbeet
- dry edible bean

In order to be successful at proactively managing herbicide resistance, you must develop a herbicide recommendation that contains at least 2 herbicide modes of action that are equally effective for controlling each of the 7 weeds in the field. You will be provided with information from the University of Nebraska Guide for Weed Management that contains herbicide efficacy data, and labeled herbicide options for each crop. You will be divided into 4 groups, and each group is responsible for developing a herbicide recommendation for one of the crops.

1. Provide the trade names and common names of the herbicides you will recommend for the crop that is assigned to your group. Also provide the recommended use rate of each product appropriate for the crop. Each of the 7 weed species must have a control rating of at least '9' from at least 2 of the active ingredients (with separate modes of action) in your recommendation.
2. Once you have developed your recommendation, calculate the cost of your proposed treatment per acre.
3. Refer to the table in the Nebraska Weed Guide that lists *Replant Options and Rotation Restrictions*. Will your herbicide recommendation prevent planting of any of the other rotational crops in this system? As a class, determine whether you can develop a crop sequence that will allow all four crops to be grown in a 4 year rotation, while utilizing your herbicide recommendations. What is the total cost per acre of the herbicide program over 4 years?