Reducing Wild Oat Herbicide Use in Cereals

The situation

Wild oats reduce cereal yields up to 50% in infested fields. Excellent herbicides are available to control these troublesome plants in cereal fields, once they become established, but the annual cost of full label rates of wild oat herbicides can run between $18 and $25 per acre plus application costs of $3 to $6 per acre.

While cultural methods of control can reduce impact from oats, wild oat infested fields often require annual treatments of wild oat herbicides to prevent significant losses. Managing the amount of chemical used, based on the principles of marginal returns would improve profitability and reduce the amount of herbicide introduced into the environment.

Achievements

All three post-emergent herbicides tested were effective in improving yield at full label rates. Rates of Assert® and Avenge® as low as 1/4 of the maximum labeled rate have provided statistically significant weed control over the control plots, as measured by yield of barley. Using economic theory and current prices for the herbicides and cereals, profit from the application of wild oat herbicides to infested fields is maximized when 1/2 to 6/10 of the maximum labeled rate is applied. The herbicide Holec® under the rather dry warm conditions of these trials did not prove to be effective at the lower rates tested. Holec can be more active under cool, damp conditions.

Our response

Since 1991 we have been experimenting with below full label and below label rates of commonly used post-emergent wild oat herbicides to determine if profitability could be improved, even if weed control was reduced.

We performed replicated trials for 3 years to examine 1/4, 1/2 and full label rates of the herbicides Assert®, Avenge®, and Holec® in infested field with populations of wild oats as high as 25 plants per square foot. Farm operators and fieldmen observed the level of weed control in the trials were they attended summer tours.
Several growers in the area, after observing the trials, have successfully used rates as low as 1/2 maximum labeled rates of Assert® or combinations of Assert® and Avenge®, each at 1/4 their maximum labeled rate. Growers are advised that application of herbicides below labeled rates, shifts the liability for herbicide performance to the grower.

We intend to continue to verify our result in this area by repeating herbicide rate trials. Since fields are often not uniformly infested with wild oats, our next tasks are determining an economic threshold, an effective method of measuring the threshold, and relating it to profitable application rates are the next steps in reducing herbicide use and improving profitability.

Cooperators and co-sponsors
Arco Feed and Fertilizer, Arco
Jensen Livestock, Moore
Mitchell Sorensen, Arco
Wade Williams, Howe
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The future

Economic Analysis of Optimum Assert Rate Based on Howe, 1993

[Graph showing economic analysis of optimum Assert rate based on Howe, 1993]