

**SUMMARY RESEARCH PROGRESS REPORT FOR 2000
AND RESEARCH PROPOSAL FOR 2001**

Submitted to:

San Luis Valley Research Center Committee

and the Colorado Potato Administrative Committee (Area II)

TITLE: Metribuzin Sensitivity and Model Evaluation

PROJECT LEADER: Asunta (Susie) Thompson, Research Horticulturist - Potatoes, Colorado State University, San Luis Valley Research Center, Center, and Dr. Scott Nissen, Extension Weed Specialist, Department of Bioagricultural Sciences and Pest Management, Fort Collins, CO.

PROJECT JUSTIFICATION:

Metribuzin, the active ingredient in Sencor® and Lexone®, is one of the most widely utilized chemical weed control agents in potato. Metribuzin is a photosynthetic inhibitor and controls many broadleaf weeds. Additionally, it may provide significant partial control of quackgrass and Canada thistle, two perennial species difficult to control in a growing crop. Application may be achieved by a variety of methods and it is an effective tank mix partner, providing a broader spectrum of weed control.

Unfortunately, a limitation of metribuzin is the sensitivity of some cultivars, which may result in significant yield loss if unknown. Foliar symptoms of sensitivity include chlorosis, leaf margin necrosis and veinal clearing. The primary objective of this ongoing project is to screen advanced selections from the Colorado potato breeding program. Information obtained is included in cultivar specific management profiles and provided to producers when trying new selections.

PROJECT STATUS: Ongoing

SIGNIFICANT ACCOMPLISHMENTS FOR 2000:

The predictive model of Love, Shaffii, Haderlie and Eberlein, where $[1 - (1.142 + 1.076(\log(\text{plant height treated}/\text{plant height control})) - 0.00796(\text{percent foliar injury}))] \times 100 = \text{percent yield loss}$, has been used in evaluating sensitivity of advanced selections and cultivars from Colorado and the southwest, in addition to being evaluated for appropriateness in this high altitude production area. The post emergent treatment is applied when plants are 8-10 inches tall at two rates, a control of 0 lbs. per acre active ingredient, or 1 lb. ai/acre. Foliar damage is assessed 21 days following application and plant height is determined prior to senescence. Total yield is obtained following harvest.

In 2000, 21 cultivars and advanced selections were screened; Shepody serves as the sensitive check and Russet Norkotah the resistant check. The treatment was applied on June 30. Weather conditions at time of treatment were wind speed of 2.9 mph, air temperature of 62F, and 42% RH. Foliar damage was assessed July 21. Plots were harvested on September 11 and weighed for total yield. As in previous years, many clones displayed foliar damage. AC87340-2, NDC5281-2 and NDC4069-4 exhibited varying degrees of susceptibility as evidenced by yield loss. Other entries were resistant in 2000. Statistical analysis of the relationship between predicted yield loss and actual yield loss resulted in an R-square value for the 21 entries of 0.596, resulting in a correlation coefficient of 77 percent.

OBJECTIVES FOR 2001:

1. Continue evaluation of advanced potato selections and recently named cultivars for resistance/susceptibility to metribuzin as a management tool for weed control.
2. Develop a weed management guide for Colorado potato production, specifically related to metribuzin usage. Publish research results related to the model (Idaho program) validation under San Luis Valley production conditions. *(This objective is in progress and I will be presenting a paper on the results of the screening work and model evaluation at the Potato Association of America meeting in April.)*

FUNDING REQUEST:

2000 Allocation:	\$2,600
2001 Request:	
Supplies	\$ 300
Travel	800
Support Personnel	<u>1,500</u>
Total	\$2,600