

## Research Proposal for 1995

Submitted to:  
SLV Research Center Committee  
and the  
Colorado Potato Administrative Committee (Area II)

**TITLE:** Root Zone Dissipation of Metribuzin: Influence of Application Technique

**PROJECT LEADERS:** Drs. Scott Nissen, Mark VanGessel, and Robert Zimdahl, Department of Plant Pathology and Weed Science, Colorado State University, Fort Collins (Phone 303-491-3489, FAX 303-491-0564) in cooperation with Mr. Randal Ristau, SLV Water Quality Demonstration Project, Cooperative Extension, Colorado State University, Monte Vista, CO.

**PROJECT JUSTIFICATION:** Metribuzin is one of the most commonly used herbicides in potato production, effectively controlling kochia, sunflowers, and pigweeds when applied either preemergence or postemergence. Metribuzin has excellent crop tolerance except on red skinned or early maturing white varieties and can be applied by sprinkler irrigation. Chemigating metribuzin is a very efficient method of application because the potential for volatility losses is very low compared to other potato herbicides like EPTAM. Applying metribuzin by chemigation is an efficient way to incorporate the herbicide in soil, chemigation could influence the potential movement of this herbicide through the effective rooting zone and increase the potential for movement to ground water. Metribuzin has been detected in well surveys conducted by the Colorado Water Resources Research Institute and the US Geological Survey. At this point levels are very low and no regulatory action is being considered; however, the occurrence of metribuzin in even minute amounts suggests that current management strategies should be examined to determine if changes could be made to eliminate movement to ground.

The proposed research is designed to examine the influence of carrier volume on movement of metribuzin through the root zone under soil and crop management conditions in the San Luis Valley. Application volumes with chemigation exceed ground methods by a factor of 100 to 1000. These high volumes reduce the interaction between the soil and metribuzin molecules and could provide sufficient hydraulic conductivity for metribuzin to move considerable distances through the soil profile in large macropores. Macropores are defined as pores that allow ready movement of air and water. They are generally air filled spaces that do not influence pesticide movement unless large quantities of water are applied. Applying metribuzin using low spray volumes would allow for increased herbicide/soil binding and minimize movement in the soil profile. This research project would provide timely management based information to the potato industry of the San Luis Valley regarding the influence of carrier volume on metribuzin movement. It would also demonstrate that growers are interested in being proactive rather than reactive about water quality and ground water issues.

**PROJECT STATUS:** New project.

**OBJECTIVES FOR 1995:** The proposed research is designed to determine metribuzin movement and dissipation when the herbicide is applied by chemigation vs. ground application.

**This objective will be accomplished using the following methods:**

- Plots will be treated with bromine to determine the movement of water following the first application.
- Plots to be treated with ground equipment will be covered with plastic before adjacent plots are chemigated with metribuzin.
- Covered plots will be treated with metribuzin within 24 hours using a backpack sprayer
- Soil samples will be taken 24 hours after application and 1, 3 and 5 weeks later.
- Soils will be sampled to a depth of 24 inches in 6 inch increments.

- Metribuzin will be extracted from soil samples and analyzed by gas chromatography/mass spectroscopy
- Plots will be replicated 4 times and the experiment will be conducted in 1995 and 1996.

**FUNDING REQUEST:**

Item	Cost 1995	Cost 1996
<b>Field Research Project</b>		
-Travel=2-3 people/1 roundtrip (establishment) (mileage, lodging, meals)	\$1000	\$1000
-Salaries (Research Associate+Student Hourly)	\$400	\$400
-Miscellaneous Supplies	\$500	\$500
<b>Subtotal</b>	<b>\$1900</b>	<b>\$1900</b>
<b>Laboratory Analyses</b>		
-Salaries (Lab Supervisor+Student Hourly)	\$2000	\$2000
-Supplies to Process Samples	\$900	\$900
-GC/MS analyses (GC Column, Pure Gases, miscellaneous supplies and service)	\$1500	\$1300
<b>Subtotal</b>	<b>\$4400</b>	<b>\$4200</b>
<b>Grand Total</b>	<b>\$6300</b>	<b>\$6100</b>

**Cooperative Agreement with SLV Water Quality Demonstration Project:**

The main function of the SLV Demonstration Project Staff will be to act as a liaison between the cooperator and CSU personnel in Fort Collins. Mr. Randal Ristau has agreed to assist in identifying off station cooperators, coordinating operations between the cooperator and CSU personnel, maintaining accurate records of general farming practices (primarily irrigation scheduling) and assisting in establishment of field site. Once the field site is established soil samples will be collected by SLV Demonstration Project personnel to reduce travel expenses for CSU cooperators.