

SUMMARY RESEARCH PROGRESS REPORT FOR 1990  
AND RESEARCH PROPOSAL FOR 1991

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

**TITLE:** Misapplication and Soil Carry-over Effects of Harmony Extra and Assert on Four Potato Varieties.

**PROJECT LEADER:** Philip Westra, Weed Scientist, CSU, Ft. Collins, CO 80523

**PROJECT JUSTIFICATION:** Potato production represents the backbone of agricultural production in the San Luis Valley. New small grain herbicides such as Harmony Extra and Assert, while used at very low rates to control broadleaf weeds and wild oats in barley, can pose serious problems for potato producers if not used properly. This project is providing much-needed detail on misapplication or soil carry-over effects of these two new herbicides on four potato varieties.

**PROJECT STATUS:** Various aspects of this project have been supported by the Area II Potato Administrative Committee since 1988. This is the last year of funding that will be requested for this type of research. Research in 1991 will terminate all proposed activities on this project, and will lead to extension and scientific publications on this issue.

**CURRENT PROJECT STRUCTURE:**

Study 1: Misapplication effects on four potato varieties  
Duration: May 1990 - October 1990  
Status: Project finished

Study 2: Soil carry-over effects of Harmony extra and Assert on four potato varieties  
Duration: May 1990 - October 1991  
Status: Second year of funding requested to finish the full research project

**SIGNIFICANT ACCOMPLISHMENTS FOR 1990.** In study 1, russett nugget, sangre, centennial russett, and russett burbank potatoes were planted on the CSU San Luis Valley research farm on May 22, 1990. Plots were 12 feet wide by 25 feet long, and all 4 varieties were present in each plot. The study consisted of 3 replications where herbicides were applied with a carbon dioxide powered backpack sprayer. Thifensulfuron methyl + tribenuron (Harmony extra) at 0.185 and 0.375 oz ai/a and imazamethabenz (Assert) at 0.235 and .47 lb ai/a were applied on June 25, 1990 as an early postemergence treatment, on July 12, 1990 as a pre-bloom treatment, and on August 2, 1990 as a post-bloom treatment. Non-destructive canopy measurements were taken during the growing season, and potatoes were harvested on September 25, 1990.

The russett nugget variety was most tolerant of herbicide treatments, followed by centennial russett and sangre. Sangre sensitivity was expressed in deep epidermal cracks, most often from the assert treatments. Russett burbank was most sensitive to all herbicide treatments, and readily developed cracked, knobby, or folded tubers which would not be marketable. The potatoes were most sensitive to damage when treatment occurred at the pre-bloom stage. Most obvious effects included a reduction in normal tuber number, a reduction in potato yield, and a reduction in average tuber weight. Assert applied at 0.47 lb ai/a at the early postemergence stage caused appreciable tuber damage to both the sangre and russett burbank varieties. This research re-emphasizes the importance of exercising caution when applying these herbicides near growing potatoes, and the importance of proper spray tank cleaning procedures following use of these herbicides.

In study 2, Harmony extra and Assert were each applied at 2 rates to growing barley in replicated plots on the SLV Center research station. Soil samples were pulled on a regular basis from all plots, and are being analyzed to determine the half life of these two products under San Luis Valley conditions. The barley was conventionally harvested, and the soil fall tilled in preparation for potato planting in the spring of 1991. Funding is requested for 1991 research which will consist of planting the above mentioned 4 potato varieties in all plots. Plants will be monitored for any herbicide carry-over effects, and all plots will be taken to final harvest for potato yield and potato quality assessment. Final soil samples will be pulled 3 times during the 1991 potato growing season to determine residual levels of these two herbicides in the soil.

**OBJECTIVES FOR 1991:** To determinate the Harmony extra and Assert soil carry-over study by determining the potato yield and tuber quality of 4 potato varieties planted into plots which were sprayed with these herbicides in 1990; to quantify soil carry-over levels of these two herbicides in San Luis Valley soil.

**FUNDING REQUESTED:**

1990 Allocation : \$ 6,000 (already received)

1991 Request : \$ 6,000 (to terminate this research project)