CPAC Area II-Funding Request for 2005

Title: Improving the Color of Red Potatoes Using 2,4-D

Investigators: Dr. Scott Nissen

Departmental Affiliation: BSPM

Nature/Scope

The use of 2,4-D to improve the color of red potato varieties was been available to growers in North Dakota since 1975. It has been difficult for potato growers in Colorado to compete in this market because of the difficulty in maintaining good tuber color after harvest. Applying 1/8 of a pint of a low volatile ester formulation of 2,4-D at the time of tuber set and making a second application 1 to 2 week later has consistently improved skin color in red potato varieties, according to data from North Dakota State University. Tubers from sprayed plants also have a smoother, shinier skin. While skin color has been improved through the use of 2,4-D, there is some yield reduction due to a reduction in jumbo tubers and an increase in medium tubers. This yield reduction has been minimal in most cases.

Colorado currently has a label to use a specific low volatile ester formulation of 2,4-D on red potato varieties to improve color. The problem is that very few replicated field evaluations have been conducted under Colorado growing conditions. In addition, not all varieties respond favorably to the 2,4-D applications. In 2004, I conducted a similar field study for the Area III growers with a variety called Dark Red Norland. This variety did not show a color response and there was some measurable reduction in yield with one of the treatments. Colorado growers would like the opportunity to evaluate the potential benefits of this program without taking significant risks. This research proposal is designed to provide growers with the information needed to make sound, research based decisions about 2,4-D applications to red potatoes.

Objective

- Determine the response of three red potato varieties to foliar applications of 2,4-D applied alone and as sequentially treatments separated by 10-14 days.
- Evaluate treatments for color enhancement, total yield, and tuber size distribution.

Methods

The basic protocol established for the use of 2,4-D to enhance the color of red potatoes suggests application rates of 2.3 oz/ac of the NuFarm 2,4-D formulations be applied twice for best results. I am proposing to evaluate two rates, 1.5 and 2.3 oz applied alone and as sequential treatments spaced 10-14 days apart. The varieties that will be used for this experiment will be selected with input from growers and researchers at the SLV research station. Varieties that have been previously tested include Red Pontiac, Red Chieftan and Red Norland. In 2004, the variety Dark Red Norland did not respond to this treatment.

The varieties will be planted in strips so that the three varieties will be present in each plot and 2,4-D treatments will be applied to an area 6 rows wide by 30 ft long. The first application will be made a tuber initiation. Foliar symptoms will be evaluated 28 days after application. Plots will be harvest and evaluated for total yield, tuber size distribution and color. Color evaluation will be conducted in two ways. The first will be using the Royal Horticultural Society color chart and the second will be rankings of color by individuals viewing random samples.

This project directly addresses one of the needs identified by the growers in 2005 call for proposals; however, I do not feel there is much chance of outside funding for this project.

Timeline

Experimental Layout and Planting	May 5
First Application	June 5-10
Second Application	June 15-20
Visual Evaluation	July 20-23
Harvest and Tuber Evaluations	September 1-2

Detailed Budget

1. Project labor

PI has 9 month contract (summer salary)	1 week	$1,750
Research associate	1 week	875
Student hourly ($10/hr)	3@ 4 days	1,280

Some of the hourly expenses will be used to pay employees of the SLV Research Station that help with planting, harvest and sorting.

Total Labor $3,800

2. Project Travel: Two trips of two days each with meals and lodging for 3 people ($200/trip vehicle charges, rooms $50/night, meals $25/day) for planting and harvest. Three one-day trips for PI for 2,4-D applications and visual evaluations.

Total travel $1,450

3. Project Chemicals: $0.0
4. Project Ag Supplies: $0.0
5. Project Equipment: $0.0
6. Project Misc.
Nozzles plus spray bottles $50
Total Misc. $50

Total expenses $5,300