

Abbreviated Report

SUMMARY RESEARCH PROGRESS REPORT FOR 2000 AND RESEARCH PROPOSAL FOR 2001

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

TITLE: Using Biocontrol Crops to Enhance Potato Production

PROJECT LEADER(S): Merlin A. Dillon, SLV Area Extension Agent, Agronomy and beginning 2002 -Dr. Russ Ingham, Associate Professor and Nematologist, Oregon State University, Corvallis, OR

PROJECT JUSTIFICATION:

Nematodes, verticillium (early dying complex), and powdery scab are becoming increasingly more important pests of SLV potato production. Fumigants and fungicides can be used to control some of these pests; however, these chemicals are also very expensive; maybe not available soon; and can be very destructive to beneficial organisms and soil health. Green manure crops have shown great potential in reducing the impact of some of these pests. The effectiveness of these biocontrol crops is now well established but what crops work best for what pests is unknown. Many other questions still remain as to how these crops grow in our environment. Dedicating one entire crop year to a biocontrol crop is still expensive (no crop income). However, if some biocontrol crop could be grown in the same season as an income crop, this would greatly reduce the expense of growing a biocontrol crop.

Research in the Pacific Northwest and other areas has shown the benefit of sorghum-sudan and rapeseed crops. In our area, Dr. Richard Zink and I conducted 3 years research into crop rotations showing the benefit of green manure corn and sudan in reducing the verticillium propagules per gram of soil (VPPG). Sudan planted in early June and incorporated into the soil in August was highly beneficial. Now, we need to know how much sudan is required to be incorporated, as well as how much benefit would accrue if the sudan was hayed and then turned under. We also want to know the effects on nematodes of cover crops grown after barley harvest.

PROJECT STATUS:

This will be the third year of funding for this project. Results of soil samples are now available for treatments in 2000 and 2001. The Ray Wright and Summit Farm trials represent treatments applied in 2000. The Bob Mattive Farm trial was planted and cover crop was incorporated in 2001.

New field trials will be established in 2002. The cooperator needs to be a commercial potato producer with a significant nematode problem; but a cooperator not using fumigation (or willing to fumigate around our plots). Vydate would be acceptable. We intend to establish cover crop treatments at barley harvest. Nematode samples would be taken at harvest of barley and fall freeze up in 2002 and at potato planting and potato harvest in 2003.

SIGNIFICANT ACCOMPLISHMENTS FOR 2001:

The results from 2000 field trials indicate again that sorghum-sudan crop was effective in reducing verticillium disease inoculum from the soil.

The 2001 field trial shows that oilseed radish, mustard, and rapeseed reduced VPPG to very low levels. The Rabbitears sorghum-sudan also produced low levels of VPPG; however, Grazex, Buffalo Brand and Sordan brands of sorghum-sudan were inconclusive; producing one sample testing high and one sample testing low VPPG.

OBJECTIVES FOR 2002:

- 1) To determine if cover crops planted after barley can reduce nematode levels
- 2) To determine the effect of wheat and barley on nematode levels
- 3) To compare various cover crop management practices and their effects on nematode levels in the following potato crop.

In cooperation with Dr. Russ Ingham, Nematologist at Oregon State University, a field trial will be established to determine the effects of certain management practices on the populations of Columbia Root Knot nematode. Treatments will include enhanced barley volunteer, rapeseed planted relay (planted in growing barley crop), and barley volunteer with rye, rapeseed or oilseed radish interseeded. A spring wheat treatment will be included to compare the effects of growing wheat vs. barley on the nematode populations. A page describing 2002 treatments follows the results tables.

Soil samples will be sent to Dr. Ingham's nematode lab at Oregon State University.

FUNDING REQUEST:

2001 Allocation: \$5,000.00:

Soil analysis	\$3490
Labor	\$ 1431
Supplies	<u>\$ 79</u>
TOTAL	\$5000

2002 Request:

Soil Nematode Analysis	\$5,000.00
Verticillium Analysis	\$1,000.00
Demonstration Seed	\$1,000.00
Labor	\$1,500.00
Mileage	\$ 500.00
Supplies	<u>\$ 500.00</u>
TOTAL	\$9,500.00