

## BENEFITS OF REDUCING PYTHIUM IN NORTHWEST POTATO SOILS

by  
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### ABSTRACT:

Pythium disorders in potato production are known to cause serious economic loss. These losses can take the form of seed piece decay, feeder root pruning, and "leak" in field and storage.

Three years of Northwest field trials have shown that practical solutions are now available to the industry. Significant improvements in stand, plant vigor, yield, grade, and storability have been demonstrated.

Timing and methods of application for achieving these improvements will be discussed. These applications are cost effective and made with existing equipment.

1990 use season labeling is anticipated for the products which will allow growers to make field comparisons.

### PYTHIUM DISEASES:

Pythium attacks most crops grown in the state. Yield response in most crops has been dramatic when pythium is controlled. The disease is most damaging at stand establishment. There is increasing evidence that it continues to impact total yield through root pruning during the growing season. In 1986 Dennis C. Gross and David J. Rhodes "...demonstrated that Pythium is a common inhabitant of potato roots and field soils in the Columbia Basin and is pathogenic to seed pieces and roots as well as stored tubers. These effects may often go unnoticed or may be confused with other diseases, but most certainly result in economic loss." (5).

### PROCEDURE:

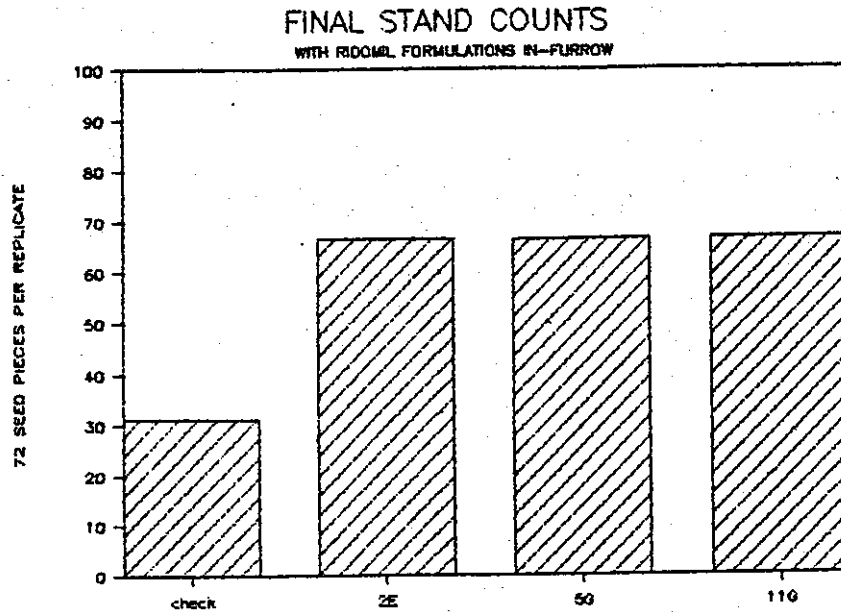
Tests in Pasco, Wa., (Alvin Harris), Othello, Wa. (Orman & Gavin Johnson), and in the Klamath Falls area of Oregon (Dale Beck - Potato Extension Specialist, and Clark and Rob Unruh, growers) were conducted during the growing seasons of 1987, 1988, and 1989.

The first year various Ridomil in-furrow formulations were used to determine what might be the best method to impact seedpiece decay. Measurements were taken of emergence, seedpiece condition, final stands, stem numbers, tuber set at row close, and yield. All untreated plots had delayed emergence and skips were numerous.

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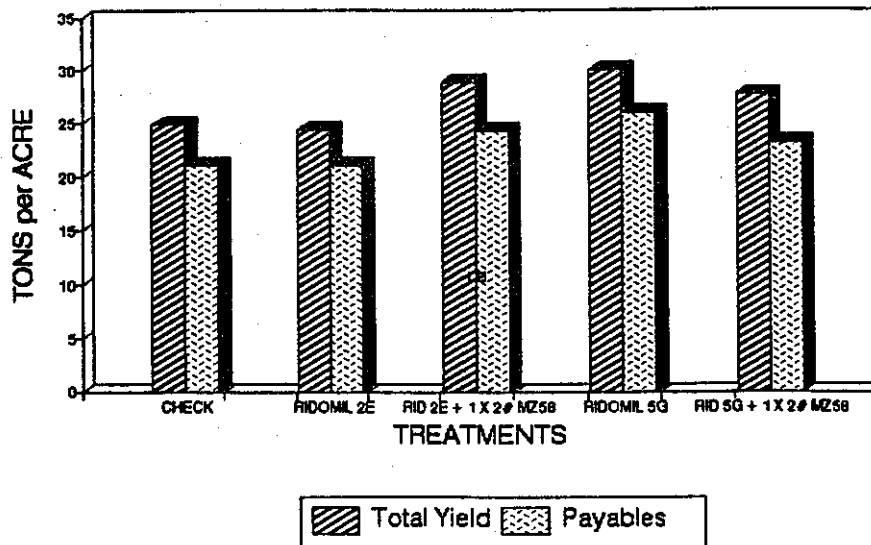
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Final stand counts were improved over 50%. The check averaged 32 and the Ridomil treatments 66 out of a total of 72 seed pieces planted.



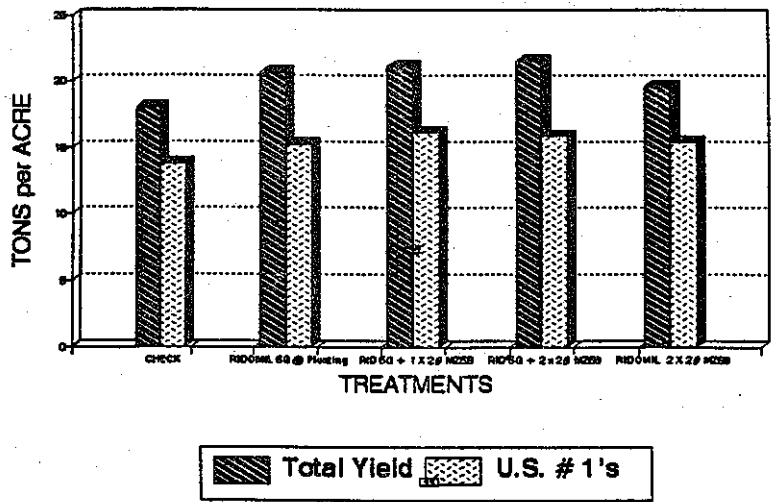
Yields were impacted as well with the Ridomil 5G formulation giving the highest yields although the Ridomil 2E placed with the liquid starter fertilizer followed by a foliar treatment also gave high yield.

**YIELDS FROM IN-FURROW RIDOMIL TREATMENT**  
1987 - PASCO, WA

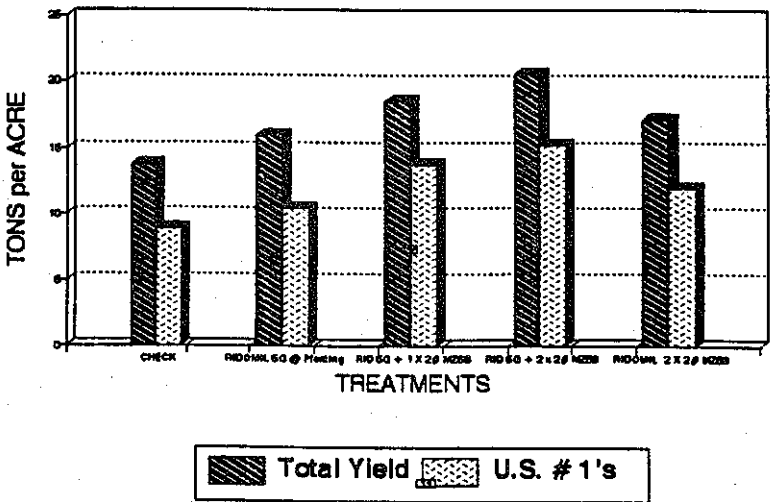


In 1988 the trials in the Klamath Basin gave us the most useful information. In the Klamath Basin we are dealing with two known soil diseases Pythium and pink rot (phytophthora erythroceptica) both of which are controlled by Ridomil. A treatment schedule was designed with sequential applications of Ridomil (in-furrow followed by foliar treatments) compared with only foliar treatments. Here it was found that in both locations tested that Ridomil 5G gave higher yields than the untreated check. Of additional interest however, was that the addition of a foliar program gave the highest yields and the highest grade of U.S. #1's with the sequential treatments out yielding the foliar (only) treatments.

**YIELDS FROM IN-FURROW RIDOMIL TREATMENT  
1988 Malin, Or.**

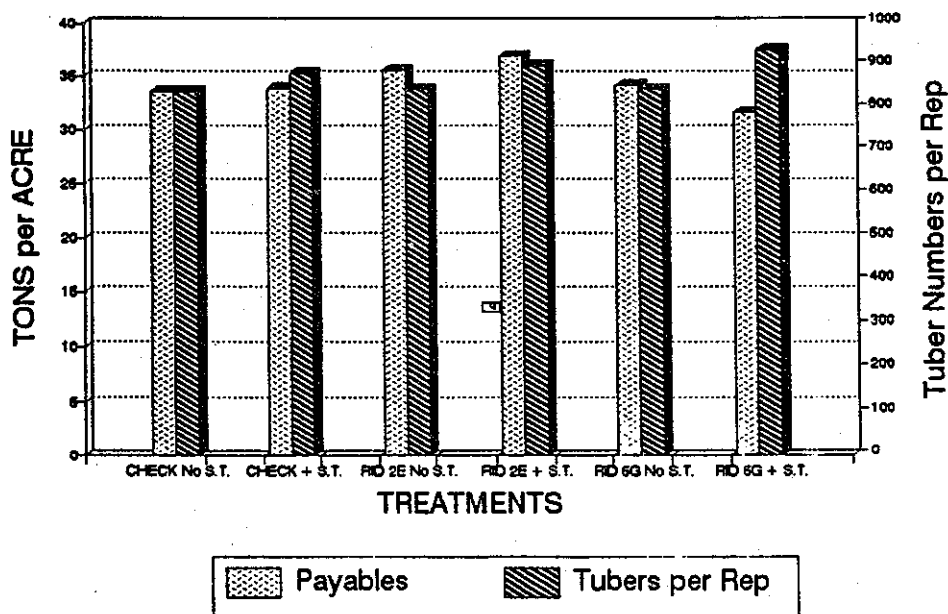


**YIELDS FROM IN-FURROW RIDOMIL TREATMENT  
1988 Klamath Falls, Or.**



In Othello, Wa., also in 1988 in-furrow tests were conducted without the sequential treatments. This test was designed to determine if there were any interactions when used with standard seed treatments. In this test the Ridomil 2E formulation gave the highest yields when used with the standard seed treatment program. Also in each case the seed treatment gave the highest tuber number (grading was done at the W.S.U. Othello Station where an exact tuber count is made as a part of the analysis). Of special interest is that although the Ridomil 5G formulation did not yield as high as the 2E it did have the highest tuber number. This may prove useful as we push for higher yields.

**YIELDS FROM IN-FURROW RIDOMIL TREATMENT  
1988 - OTHELLO, WA**



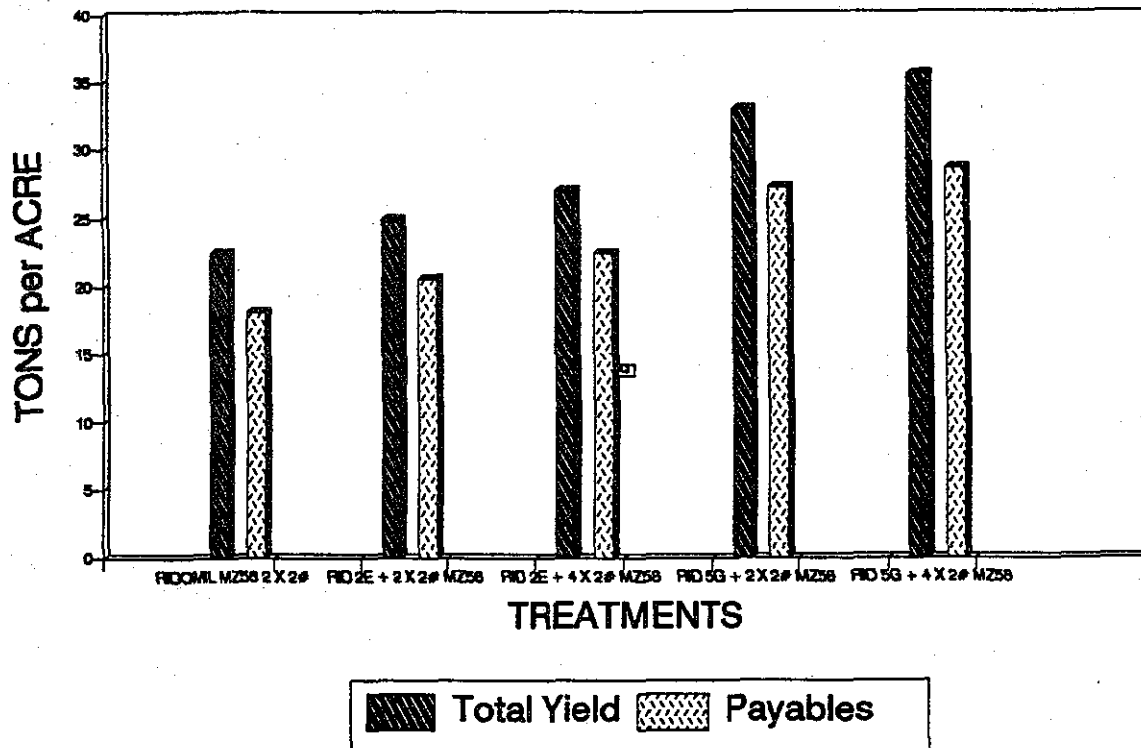
The tests for 1989 were designed with the information learned over the past two years. The plot location was on the same farm as the 1987 test south of Pasco, Wa. The grower was going into long term storage with these potatoes and had chosen to use the standard Ridomil program of two foliar applications mid-season to control Pythium leak - the reason the control is 2 applications of Ridomil MZ58. In this test we essentially maintained a level of Ridomil in the soil all season and kept the pythium level down all season as well thus allowing the dramatic differences in yield and grade.

## YIELD RESULTS OF RIDOMIL USE IN-FURROW ON POTATO

Alvin Harris  
Pasco, Wa  
1989 Crop

	Tons per Acre				%				Small Culls	Specific Gravity
	Total	PAYABLES	%	4-6 OZ.	6-10 OZ.	10-14 OZ.	>14 OZ.			
STANDARD TREATMENT										
RIDOMIL MZ58 2 X 2	22.51	18.14	81	30	36	12	3	19	1.0928	
RID 2E + 2 X 2# MZ58	24.95	20.62	83	24	37	13	9	17	1.0944	
RID 2E + 4 X 2# MZ58	27.03	22.57	84	21	33	18	12	16	1.0934	
RID 5G + 2 X 2# MZ58	33.03	27.24	82	22	29	19	12	18	1.0916	
RID 5G + 4 X 2# MZ58	35.58	28.63	80	19	31	19	12	20	1.093	

## YIELDS FROM IN-FURROW RIDOMIL TREATMENT 1989 - PASCO, WA



## CONCLUSIONS:

From the three years of testing it appears that Ridomil used in-furrow (particularly the 5G formulation) can have an impact on stand, yield and grade. It will be particularly useful in improving stands in years when soil temperatures are warmer than normal for the planting date (as occurred in 1987). The subsequent years of testing have shown that even when stands have not been adversely affected yield and grade increases have been realized (this is especially true when foliar applications are made sequentially to the in-furrow treatments). 1990 work will look at what impact this program might have on other varieties (Shepody, early "reds", etc.).

## LABELING

This use is not yet labeled. State Labels will be applied for as soon as a federal tolerance is approved as a part of the Root and Tuber crop grouping that is expected near the first of May, 1990. At that time a 24-C label will be requested that will have a restriction to be used on commercial production (no seed) only in those areas free of late blight. Okay for use in the Columbia Basin of Washington and Oregon, the Klamath Basin, and Idaho. Do Not use in areas of the Northwest west of the Cascade Mountains.

## REFERENCES:

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