CONTROLLING PYTHIUM SEEDPIECE DECAY IN THE COLUMBIA BASIN OF WASHINGTON STATE

by
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Introduction

Based on observation and the writings and research of others (6) pythium is a common disease of potato fields in the Columbia Basin that attacks both potatoes in store and while growing in the field. There are E.P.A. registered materials to control pythium leak in the developing crop but not this same disease at planting. This paper will describe a method that offered good control of pythium at planting in the spring of 1987; and evaluate these potatoes in store after an additional foliar application of fungicide was made at row close.

Pythium Diseases

Pythium attacks most crops grown in the state from apples to zucchini because pythium is present in all soils. Many of us are just learning that controlling pythium can result in substantial yield increases. Only a few years back at WSU it was demonstrated that a 25% yield increase can result when pythium is controlled in winter wheat (2). This past summer south of Moses Lake an increase of over 830 pounds of dry peas (over the no treatment standard of 2400#) resulted when pythium was controlled. Control of pythium leak in potatoes during the warm harvest season of 1987 has resulted in at least one instance of 6% rot being reduced to zero.

During the spring of 1987 pythium seed piece decay was easy to find in a number of fields in the Pasco area. Some were salvaged and only some stand loss occurred. Some were replanted resulting in delays, additional costs, and lost production time. Because of the opportunity presented a site was chosen on an irrigated circle south of Kennewick.

Procedure Followed

Applications were made in late April. Three different treatments of eight replicates were hand planted with two rows each of 36 seed pieces placed ten inches apart. Granular treatments were applied directly over the seed pieces in the furrow.

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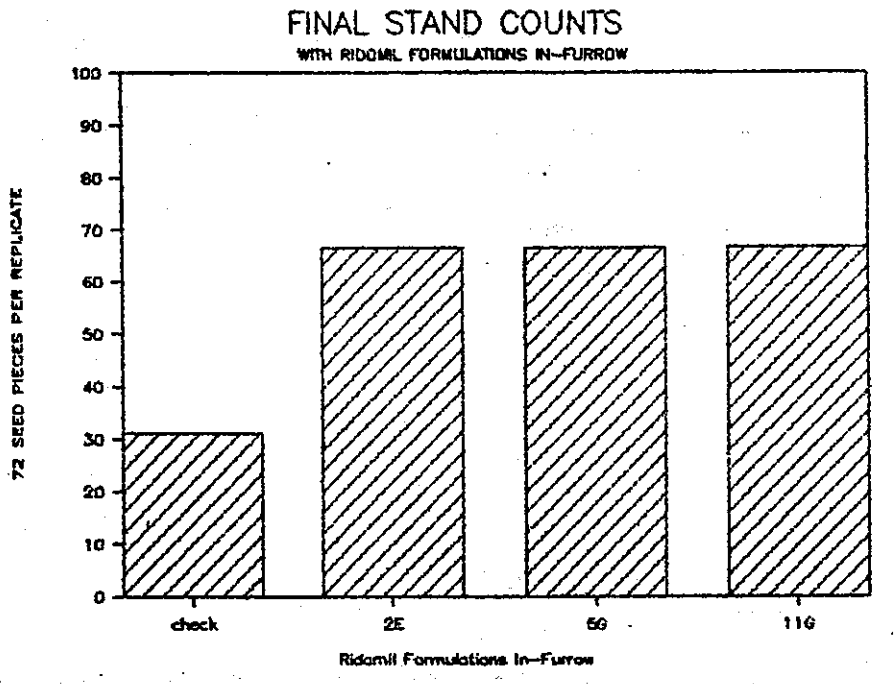
The liquid formulation with liquid fertilizer was applied in a split band one inch above the seed after partial covering. All treatments were .25# a.i. of Ridomil. The 11G also contained 10% terrachlor. No other seed treatments were used.

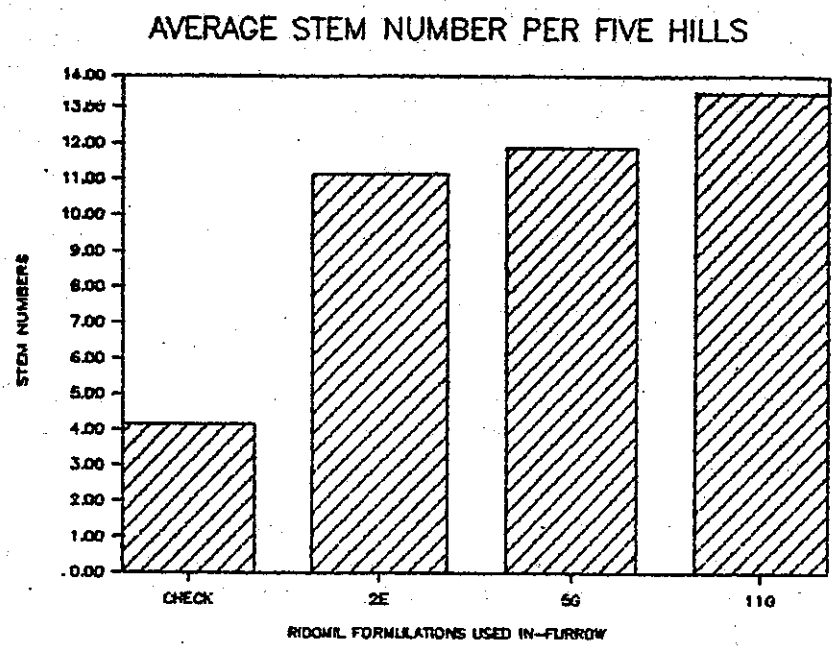
The first evaluations of emergence were made two weeks later. Significant differences were noticed on the various treatments. All untreated plots were delayed in emergence and skips were numerous.

Final stand counts, stem numbers, seed piece condition, and tuber set evaulations were made when plants were fifteen inches tall. These counts were made from the north end of each of the rows of the two treatments consisting of a total of ten plants each. The following graphs illustrate the differences between the treatments.

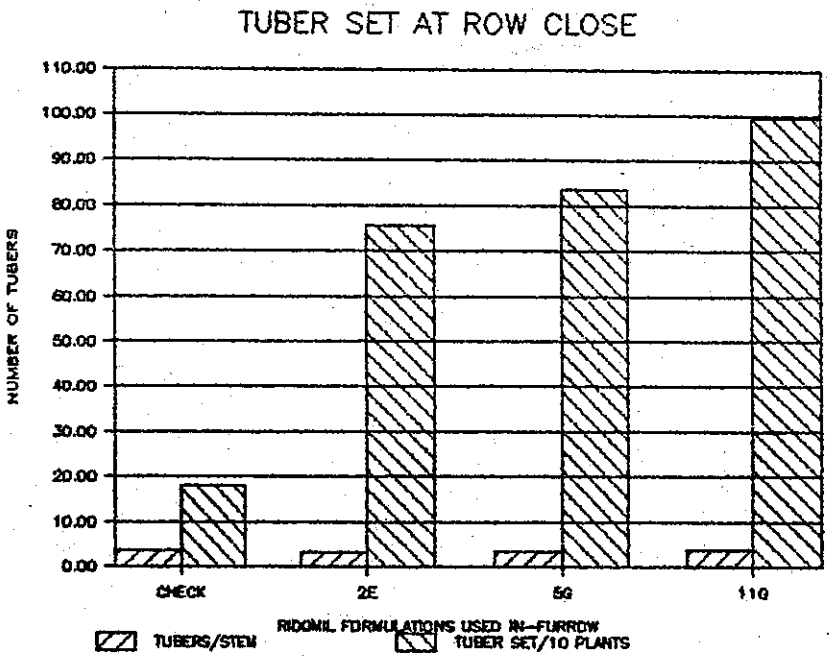
Final stand counts were improved over 50%. The check averaged 32 and the Ridomil treatments 66 out of a total of 72 seed pieces planted.



The average stem number per five hills averaged 4.2 for the check and the Ridomil treatments ranged from 11 to 13.5



The tuber set at row close per 10 plants was only 18 for the check and ranged between 75.5 and 99.5 for the Ridomil treatments. The average number of tubers per stem was not different but the number of stems per five hills was substantially different as shown above.



Comparison With Current Pythium Leak Program

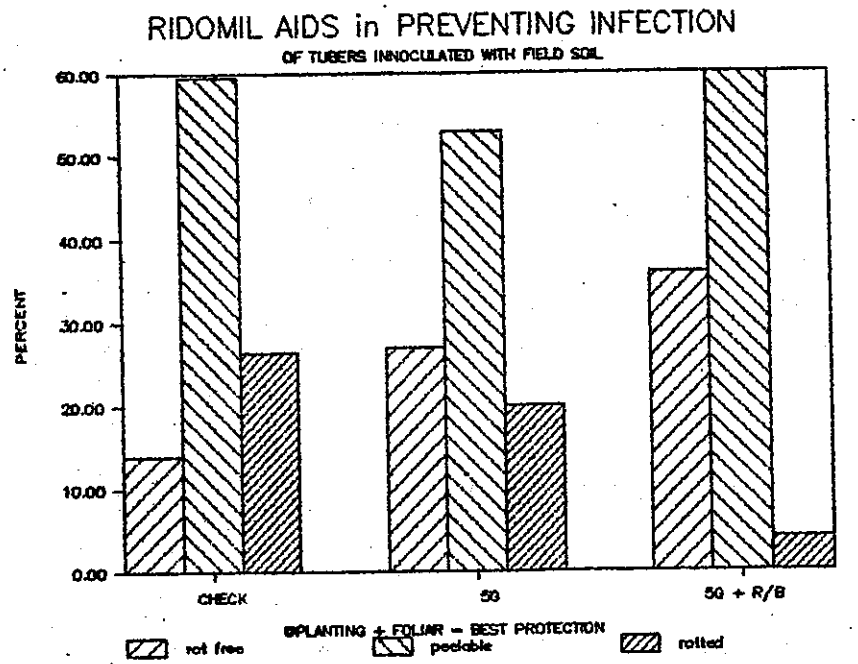
In order to be able to compare the results obtained with the currently labeled program for pythium leak control a second part of the experiment was initiated. It was speculated that one in-furrow treatment might give some lasting control toward the control of leak in storage (1). In order to test this the above experiment was split and one-half of each of the reps were sprayed with 2# of Ridomil/Bravo 81WP at 2# per acre just prior to row close. These potatoes were then followed into storage and evaulated further.

The potatoes were machine harvested in October with a two row digger and later were sorted and graded at the WSU research farm in Warden. Total yields of #1 potatoes of all Ridomil treatments versus the check averaged an 11% increase. Ridomil 5G gave the largest difference of 15% increase in #1's.

All samples were stored in a Suberizer storage south of Othello. One week later fifty count samples were cut and innoculated with field soil and left to incubate in the storage.

These fifty count samples were evaulated for deterioration in mid-January and consistent improved quality was seen with the addition of the foliar application. Evaluations as to rot free, peelable, and cull were made as the following graph illustrates.

This graph represents only the 5G formulation but the trend is the same with the 2E and 11G formulations. The trend is for the numbers of rot free to increase with additional Ridomil treatments and for the rotted tubers to decrease with additional Ridomil.



Conclusions

Ridomil treatments significantly improved stands, stem numbers, and tuber set with in-furrow applications under Spring '87 conditions.

One of my objectives in setting up this test was to determine if one in-furrow application plus one foliar application of Ridomil would give equivalent pythium leak protection to our currently labeled program. It does, and allows the product to be used in a way that the producer realizes more benefits (early pythium + leak control in store) for the same costs.

Next seasons work will involve looking at this same program at early, mid-season, and late planting dates. This needs to be done to assess Ridomil's benefits on these earlier plantings. Pythium seed piece decay at the earlier plant dates may not be as critical but the benefits for controlling pythium on the young feeder roots may be just as economical.

LABELING

At the current time Ridomil is not labeled for in-furrow use but the procedure has been submitted to EPA for approval and is anticipated for the 1989 season.

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