POTATO FUNGICIDE STUDY

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Abstract

An experiment to evaluate the efficacy of two clorothalonil formulations (Bravo 720 and Bravo 825), two mancozeb formulations (Manzate 200DF and Dithane F-45), and copper hydoxide (Champ) on potato early blight, late blight, and black dot was planted at the Powell Butte site of Central Oregon Agricultural Research Center on June 7, 1993. No late blight or black dot was observed during the growing season and minimal early blight was noted because of weather conditions. All of the fungicide treatments tested reduced the level of early blight as compared with the untreated check. There were no differences in early blight control among the fungicide treatments. There were no statistically significant differences in yield, specific gravity, or tuber weight among the fungicide treatments.

Introduction

Foliar diseases are commonly observed on potatoes wherever they are grown. Late blight *(Phytophthora infestans)* is one of the most devastating diseases on potatoes worldwide, but rarely has been observed in central Oregon (3,4). Early blight *(Alternaria solani)* is the most common annually occurring foliar disease of potatoes in central Oregon. Early blight is most severe under alternately wet and dry conditions, consequently the problem is frequently observed in sprinkler-irrigated potato growing regions. If not controlled it can reduce both tuber yield and quality in some cultivars (1,2).

New fungicide formulations and chemistry are continually being developed for the control of various foliar diseases on potatoes. This study was designed to evaluate the efficacy of selected fungicides on late blight, early blight, and black dot *(Colletotrichum coccodes).*

Materials and Methods

An experiment to evaluate the efficacy of selected fungicides on potato early blight, late blight, and black dot was planted at the Powell Butte site of Central Oregon Agricultural Research Center on June 7, 1993. The experiment was planted with the cultivar Russet Burbank and arranged in a randomized complete block design with four replications. Individual plots were 22.5 feet long by four rows wide (12 feet). A total of 120 seed pieces were planted 9 inches apart in each plot, with 30 seed pieces in each row of the plot. Plots were bordered on each end with 3.75 feet of bare ground.

The experiment was fertilized, cultivated, sprinkler irrigated, and managed according to practices commonly used in central Oregon.

This study was supported in part by a grant from ISK Biotech Corporation.

Five fungicide treatments were applied on August 4, 1993, and again on August 18, 1993. The control plots received no treatment. Applications were made using a carbon dioxide powered backpack sprayer delivering 30 gallons per minute at 40 psi. Plots were visually rated for the presence of early blight, late blight, and black dot on August 18, August 31, September 7, and September 14, 1994. Disease severity was rated as the percent of plants in the plot with any symptoms of the respective disease.

A 20-foot section from one of the two middle rows was harvested October 19-21, 1993. Plots were weighed and graded into three grade and four size categories. The total number of tubers per plot was determined and used to calculate the average tuber size. Specific gravity was evaluated by the air/water method.

Results

Foliar disease development was minimal during the 1993 growing season in central Oregon because the plots were planted three weeks later than normal (wet soils) and temperatures were cooler than normal. No late blight or black dot was observed during the growing season and minimal early blight was noted.

The effect of fungicide treatments on the severity of early blight is summarized in Table 1. No early blight was observed until August 31, 1993. All of the fungicide treatments tested reduced the level of early blight as compared with the untreated check on August 31 and September 7. There were no differences in early blight control among the fungicide treatments for any of the dates disease evaluations were conducted. Frost desiccated the vines on September 20-23, 1993, which terminated foliar disease evaluation.

Fungicide treatment effects on yield, specific gravity, and tuber weight of Russet Burbank potatoes are summarized in Table 2. There were no statistically significant differences in yield, specific gravity, or tuber weight among the fungicide treatments.

Table 1. Fungicide treatment effects on early blight of Russet Burbank Potatoes

		Early Blight Symptom Development			
Treatment	Rate'	Aug 18	Aug 31	Sept 7	Sept 14
Bravo 720	1.5 Pts/A	0	4	5	8
Bravo 825	1.4 Lbs/A	0	3	8	8
Manzate 200DF	2.0 Lbs/A	0	4	5	8
Champ	4.0 Pts/A	0	5	9	9
Dithane F-45	1.6 Qts/A	0	5	6	10
Untreated Check		0	13	14	16
LSD 5%		NS	5	5	NS

1--rate of product per acre

Table 2. Fungicide treatment effects on yield, specific gravity, and tuber weight of Russet Burbank potatoes

Treatment	Rate'	Total Yield	No. 1 Yield	Specific Gravity	Tuber Weight
		cwt/a	cwt/a		oz
Bravo 720	1.5 Pts/A	440	316	1.080	5.92
Bravo 825	1.4 Lbs/A	443	323	1.080	5.83
Manzate 200DF	2.0 Lbs/A	455	339	1.080	8.16
Champ	4.0 Pts/A	419	300	1.081	7.34
Dithane F-45	1.6 Qts/A	441	322	1.080	5.01
Untreated Check		425	315	1.079	5.43
LSD 5%	NS		NS	NS	NS

1--rate of product per acre

References

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