

RESULTS OF 1965 SOIL FUNGICIDE SCREENING TRIALS
FOR CONTROL OF RHIZOCTONIA AND VERTICILLIUM

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Ten experimental chemicals were screened for control of Rhizoctonia and Verticillium wilt (tables 1, 2 and 3). Hand equipment was used to broadcast the chemicals on the surface of previously plowed and disced soil. All treatments were mixed into the soil to a depth of 5-6 in. with a tractor mounted rototiller approximately 30 minutes after broadcasting.

In 1964, the soil in this field at the Othello Research Farm was thoroughly infested with Verticillium wilt organism, Verticillium albo atrum R. and B. (microsclerotial type). Infestation was accomplished by planting seed pieces which had been dipped into a blended suspension of the organism. Soil in the field was naturally infested with the Rhizoctonia organism.

The chemicals were applied to the soil on March 30. The test plots were planted with non-infested seed pieces of the Russet Burbank potato variety on April 9. Approximately 300 lbs. of N, 52 lbs. of P, 100 lbs. of K, and 10 lbs. of Zn were banded at planting.

By September 15, when a killing frost occurred, almost all of the plants in the plot were killed or near death due to Verticillium wilt organism. The tubers were harvested on September 30.

Verticillium wilt symptoms appeared about July 15. Wilt readings on August 10 showed only D-735 (20 lb. active/A.), Lanstan[®] (60 lb. active/A.) and potassium azide (36 lb. /A.) to delay symptoms significantly compared to the control (table 1). By August 23, almost all of the plants throughout the experiment were expressing wilt symptoms. None of the treatments were significantly delaying wilt. By September 1, practically all of the plants in the test were either killed by the organism or were exhibiting some degree of wilt.

None of the treatments satisfactorily controlled Rhizoctonia stem infection or tuber black scurf (table 2). Only 9% of the control had no Rhizoctonia lesions. The best control, Terraclor[®] (30 lb. active/A.), increased the number of stems with no visible Rhizoctonia lesions to 30%, or 21% greater than the control. Forty-nine percent of the tubers by weight in the control had the black scurf stage. The best treatments, Terraclor[®] (30 bl. active/A.) and Terraclor Super X[®] (30 + 15 lb. active/A.) reduced black scurf by only 12 and 11%,

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respectively. None of the black scurf was severe enough to place the tubers in the U. S. cull grade.

F-306 (5 lb. active/A.), Lanstar[®] (60 lb. active/A.) and Terraclor Super X[®] (30 + 15 lb. active/A.) significantly increased the mean number of total stems, compared to the control (table 3). A greater number of stems could produce a greater yield per acre, however, only one treatment, Lanstar[®] (60 lb. active/A.), significantly increased the mean tuber weight, compared to the control. This treatment produced 530 cwt./A. compared to 407 for the control. None of the treatments increased or decreased the U. S. No. 1 tubers.

Table 1. The effect on the Verticillium wilt organism by chemicals applied to the soil near Othello, Washington.

Chemicals	Lbs. active per acre	Mean number of Verti- cillium wilted plants	
		Aug. 10	Aug. 23
DAC 469	20	16	19
"	30	15	20
Di-Syston [®]	3	11	16
"	9	11	16
D-735	5	11	16
"	20	7*	16
F-306	5	9	17
"	20	10	18
Lanstar [®]	30	10	15
"	60	7*	17
Polyram [®] (gran.)	60	11	18
" (dust)	60	11	17
Potassium azide	12	13	18
"	36	8*	15
S. F. 1823	30	9	17
"	60	9	17
Terraclor SuperX [®]	15 + 7.5	15	19
"	30 + 15	14	19
Terraclor [®]	30	14	19
Control	none	13	19

*Values significantly lower than the control.

Table 2. The effect on the Rhizoctonia organism by chemicals applied to the soil near Othello, Washington.

Chemicals	Lbs. active per acre	Mean % clean stems (no Rhiz. lesions)	Mean % tubers with black scurf (weight)
DAC 469	20	11	43
"	30	15	50
Di-Syston [®]	3	8	51
"	9	21	64
D-735	5	8	41
"	20	5	56
F-306	5	9	54
"	20	11	56
Lanstan [®]	30	10	61
"	60	4	62
Polygram [®] (gran.)	60	3	59
" (dust)	60	14	67
Potassium azide	12	3	43
"	36	15	67
S. F. 1823	30	17	50
"	60	8	53
Terraclor Super X [®]	15 + 7.5	20	53
"	30 + 15	24*	38
Terraclor [®]	30	30*	37
Control	none	9	49

*Values significantly higher than the control.

Table 3. The effect on production by chemicals applied to the soil near Othello, Washington.

Chemicals	Lbs. active per acre	Mean total stems	Mean % U. S. No. 1 (weight)	Mean total tuber weight (cwt. /A.)
DAC-469	20	36	55	376
"	30	36	48	407
Di-Syston [®]	3	34	45	428
"	9	36	52	421
D-735	5	36	56	407
"	20	39	58	385
F-306	5	40*	56	472
"	20	33	64	363
Lanstan [®]	30	38	50	443
"	60	40*	55	530*
Polyram [®] (gran.)	60	34	56	428
" (dust)	60	36	51	450
Potassium azide	12	34	56	399
"	36	34	53	399
S. F. 1823	30	36	61	443
"	60	36	66	421
Terraclor Super X [®]	15 + 7.5	33	58	341
"	30 + 15	40*	47	327
Terraclor [®]	30	38	58	319
Control	none	34	52	407

*Values significantly higher than the control.