

## WILL TERRACLOR (PCNB) CONTROL RHIZOCTONIA?

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### The Chemical

The active ingredient of Terraclor (trade name of the Olin Matheson Chemical Corporation) is Pentachloronitrobenzene (PCNB). This chemical, as reported in the "Guide to Chemicals Used in Crop Protection," Canadian Dept. of Agr., was developed by I. G. Farbenindustrie and introduced in the late 1930's as a fungicide. Terraclor is practically insoluble in water.

### Company Recommendations For Use

According to the Olin Matheson pamphlet, "Terraclor Soil Fungicide Controls Rhizoctonia," the application of liquid Terraclor at planting time at a rate of 5 lb. active ingredients per acre will give fair control of Rhizoctonia, while 10 lb./A or 15 lb./A will give good to superior control. According to the pamphlet, Terraclor promotes early vigorous growth, even stands and increases the number of marketable U. S. No. 1 grade tubers.

### Chemical Cost

The cost of 5, 10, and 15 lb. of active ingredient per acre of Terraclor (liquid form) is approximately \$1.55/lb. or \$7.75, \$15.50 or \$23.25 per acre, respectively.

### Restrictions and Regulations

According to the "USDA Summary of Registered Agricultural Pesticide Chemical Uses" issued September 15, 1962, PCNB can be broadcast on soil at the rate of 195 lbs. active ingredient per acre (wetable powder or dust only) prior to planting and applied as a row treatment to the soil at the rate of 65 lb. active ingredient per acre (wetable powder or dust only) prior to planting. ~~This regulation on its use does not recognize the use of the liquid form of PCNB as either a broadcast or row treatment nor does it sanction the use of any form of PCNB at the time of planting.~~ No residue tolerance was listed for PCNB in the "USDA Summary of Registered Agricultural Pesticide Chemical Uses." This means that no tolerance for PCNB has so far been established by the Federal Food and Drug Administration. If any residue is found in the tubers, the crop has to be destroyed.

### 1964 Terraclor(PCNB) Experiments

This year Terraclor was tested at Othello, Pasco and Prosser, Washington (Tables 1, 2, 3 and 4). At the Othello plots, liquid Terraclor was sprayed on the soil surface at rates of 10, 20 and 40 lb. active ingredient per acre

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followed by rototilling. Planting was delayed until three weeks after treatment. Terraclor increased yield at the 40 lb. rate but not at the 10 and 20 lb. rates (Table 2). The percent of No. 1 tubers was increased by all rates of Terraclor. Stem cankering was reduced by all three rates of Terraclor, while black scurf was reduced at only the 20 and 40 lb. rates (Table 1). At Pasco, liquid Terraclor was sprayed on and mixed into the soil of each row with equipment attached to the planter. A 15 lb. active ingredient rate per acre, as recommended by the Olin Matheson Chemical Company, was applied as well as a 30 lb. per acre rate to check for possible harmful effects. The total yields of the plots treated with 15 and 30 lbs. of Terraclor were slightly less than that of the untreated plots. (Table 3) Neither rate of Terraclor increased the number of No. 1 tubers produced per plot. At this location the 30 lb. rate reduced *Rhizoctonia* stem girdling. The black scurf stage of *Rhizoctonia* did not develop on tubers from either treated or nontreated soils. The method of applying liquid Terraclor at Prosser was similar to that at Pasco. Some of the plots at Prosser were fumigated with Telone and Telone-chloropicrin three weeks prior to planting so that the two methods of treatment could be compared. The results are given in the section "1964 Fumigation Results." Terraclor was applied at 7.5, 15 and 30 lbs. active ingredient per acre (Table 4). None of the rates of Terraclor increased total yield, the total number of tubers produced per plot, or the percent of U. S. No. 1 tubers. The 30 lbs. rate actually decreased the total number of tubers produced and the percent of U. S. No. 1 tubers. None of the PCNB rates decreased the *Rhizoctonia* stem cankering (evidence not given in Table 4). *Rhizoctonia* black scurf was reduced by all three rates of Terraclor (Table 4).

#### Previous Experimentation with Terraclor in Washington

In 1963, Robert Kunkel, Horticulturist, Washington State University, reported that Terraclor applied at rates of 30 and 60 lbs. active ingredient per acre did not increase yield compared to the control and that Terraclor may actually be detrimental to yield at the higher rate. In 1955, J. D. Menzies, USDA Microbiologist, working at the Irrigation Experiment Station, Prosser, found that 20 lbs. per acre of Terraclor gave good control of stem canker, but 40 lbs. per acre was necessary to control tuber black scurf. He also reported that total yield was not increased at rates of 20, 40, 60 or even 80 lbs. active ingredient per acre compared to the untreated control. In the experiments reported by the above workers, dry forms of Terraclor were broadcast and disked or rototilled into the soil.

#### Summary

This year's experimentation and the work of previous investigators in Washington have not clearly shown whether Terraclor would be of any benefit to Washington potato growers. Some of the rates of Terraclor tested at and above those recommended by the Olin Matheson Chemical Company did not consistently reduce both *Rhizoctonia* stem canker and tuber black scurf or increase the percent of No. 1 tubers. Yield and the total number of tubers produced were not increased by any of the rates of Terraclor recommended by the Olin Matheson Chemical Company. Washington State University at the present time does not recommend the use of Terraclor as a dust, wettable

powder or liquid for the control of *Rhizoctonia* stem canker or tuber black scurf. Research will continue in 1965 to determine if Terraclor has any benefit for Washington potato growers.

Table 1. The effect of Terraclor (PCNB) in *Rhizoctonia* stem canker and black scurf at Othello, Washington in 1964.

Lbs. PCNB per acre	% Stem girdling	% Tuber black scurf
0	75	86
10	57	87
20	47	58
40	46	65

Table 2. The effect of Terraclor (PCNB) on potato production at Othello, Washington in 1964.

Lbs. PCNB per acre	Total yield (cwt)	Total number of tubers	% Weight U. S. No. 1
0	477	69	78
10	477	64	88
20	446	60	87
40	600	76	86

Table 3. The effect of Terraclor (PCNB) on *Rhizoctonia* stem girdling and potato production at Pasco, Wash. in 1964.

Lbs. PCNB per acre	% Stem girdling	Total yield (cwt)	% Weight U. S. No. 1
0	45	484	89
15	37	430	83
30	25	422	88

Table 4. The effect of fumigation and Terraclor (PCNB) on disease control and production at Prosser, Washington in 1964.

	Yield (cwt)	Total number of tubers	U. S. No. 1	Rhiz. tuber black scurf
No fumigation	0	0	0	0
Telone, 45 gal./A	+	0	0	0
Telone & chloropicrin 20 & 3 gal./A	+	+	-	+
No PCNB	0	0	0	0
7.5 lb. PCNB/A	0	0	0	-
15 lb. PCNB/A	0	0	0	-
30 lb. PCNB/A	0	-	-	-

+ = increase

0 = no change

- = decrease