

SUPPLEMENTAL REPORT ON THE CONTROL OF THE
SUGAR-BEET NEMATODE BY SOIL FUMIGATION

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Experimental work reported to this society in February, 1946, was continued through the year with the following results:

1. Second year yields after fumigation.

A. Plots on field Number 2 on which yields of 13 to 18 tons of sugar beets were produced in 1945 were again planted in 1946. An excellent stand was secured but soon after thinning those on the treated plots were killed out by the nematodes. Obviously, a sufficient number escaped the 1945 fumigation to produce tremendous populations on the large beets grown that year and consequently the plots were disked up and abandoned early in 1946.

B. Plots in field Number 3 at Lewiston, Utah reported in 1946 were replanted and gave the following yields:

TABLE I

Amount of Chemical Applied per acre	1945		1946	
	Treated plots	Untreated check plots	Treated Plots	Untreated Check Plots
DD - 50 gals	13.12 tns.	13.04 Tons	11.22 tns.	
" " "	14.09 "	10.62 "	8.24 "	
" " "	16.07 "	13.75 "	10.33 "	5.07 Tns.
" " "	14.37 "	8.45 "	3.98 "	
" " "	11.03 "	12.50 "	4.10 "	

Check plots in 1946 were not harvested separately and only the average for the group, 5.07 Tons, is given. This field had been in alfalfa 5 years followed by wheat leaving a relatively low nematode population. As a result there was a definite carry-over in the effects of fumigation.

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2. Comparison of fall and spring fumigation.

A. A field near Lewiston, Utah, severely infested with sugar beet nematodes in 1945 was divided into two portions and blocks treated with D-D at various rates:

TABLE II

Amount of Chemical Applied per acre	Yields of Sugar Beets per acre	
	Fall, 1945	Spring, 1946
D-D 25 gals	12.51 Tons	(20 gals.) 10.30 Tons
D-D 30 "	11.65 "	10.91 "
D-D 40 "	10.94 "	11.46 "
Untreated Checks	5.13 "	5.13 "

A high water table in this field caused short, turnip-shaped roots, resulting in low yields where the tops indicated at least 20 tons per Acre on all plots. The slight range in yields between fall and spring application indicates that there was little, if any, difference in their effectiveness. In like manner, nothing was gained by applying 30 and 40 gallons per acre.

B. Field Fall treated after oats and field peas were harvested for hay. Beets had not been grown on this field for 7 years.

TABLE III

Amount of chemical Applied per acre	Yield of Sugar Beets per acre
Check, untreated	7.90 tons
20 gals, D-D	18.32 "
20 gals. Dowfume W10	7.31 "
Check, untreated	9.31 "
30 gals D-D	16.66 "
30 gals. Dowfume W10	10.46 "
Check untreated	9.63 "
40 gals. D-D	17.65 "
40 gals. Dowfume W10	7.08 "

C. Field spring treated after 7 years alfalfa and grain. Blocks of 16 rows, 600 feet long.

TABLE IV

Amount of Chemical Applied per acre	Yields of Sugar Beets per acre
20 Gals D-U	17.78
30 " "	15.16
40 " "	14.40
Check, Untreated	9.77
20 Gals. D-D	11.12
30 " "	10.89
40 " "	10.39
25 " " (2.58 acres)	10.95
Check, Untreated	7.97
25 Gals 9-1*	11.61
25 " S-776**	12.48

Yields of both (D) and (U) fields are lower than anticipated because of high water table. Apparently there was slight damage to seedling beets on some of the 30 and 40 gallon applications as indicated by their lower yields.

3. Minimum applications of soil fumigants. The field selected had produced 18 tons of beets per acre in 1944 following a rotation of alfalfa and grain. Wheat was planted in 1945, thus allowing a considerable reduction in nematode infestation to take place. The following yield per acre data for each treatment are based on 2 plots of 4 rows each, 60 feet long, or a total of 480 feet of row. Yields of adjacent check plots are shown in parenthesis.

* A mixture of 9 gallons D-D and 1 Gallon ethylene dibromide

** A mixture of 9 gallons Dowfume N (anythetic D-D) and 1 gallon ethylene dibromide.

Application	20 Gal.	15 Gal.	10 Gal
Dowfume S-776 ****	28.65 tons (11.35 ")	18.65 tons (13.10 ")	9.37 tons (6.62 ")
Shell D-D	25.77 " (14.10 ")	16.15 " (12.17 ")	9.22 " (7.20 ")
Dowfume - 777***	24.37 " (12.70 ")	18.57 " (12.07 ")	9.74 " (6.55 ")
Shell - 28*	23.77 " (11.65 ")	17.90 " (12.42 ")	11.05 " (8.32 ")
Shell - 19**	22.52 " (14.45 ")	18.92 " (12.70 ")	7.47 " (6.70 ")
Dowfume W10	20.00 " (12.40 ")	15.95 " (13.17 ")	10.45 " (9.15 ")

4. Yields from commercial field treatments Rupert, Idaho

TABLE V

Acres	Application	Tons per Acre	
		treated	Check
3.0	25 Gal. D-D	21.09	2
3.0	" " "	18.50	*
1.5	25 P 50 "	22.0	5

- * 8 gallons D-D plus 2 gallons ethylene dibromide
- ** 9 gallons D-D plus 1 gallon ethylene dibromide
- *** 9 gallons Dowfume N plus 1 gallon ethylene dibromide
- **** 8 gallons Dowfume N plus 2 gallon ethylene dibromide

5. Control of wire-worm, Nyssa, Oregon

TABLE VI

Beets in 100 feet of row

<u>Application</u>	<u>After thinning</u>	<u>September</u>	<u>Check</u>
50 gals. Dowfume W10	90	82	45
25 gals. " "	90	77	47
50 gals. D-D	90	75	51
25 gals. D-D	90	84	42
