Chemical Control of *Heterodera schachtii* on Sugarbeet in California

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Soon after the discovery of 1,2-dichloropropane 1,3-dichloropropene as a nematicide, in the late 1940's, several thousand hectares of land infested with *Heterodera schachtii* Schmidt were treated. Control of *H. schachtii* was easier to obtain on sandy soils (5) than on clay or peat-type soils. Yields of sugarbeet roots of 51.7 or 53.5 tonnes/ha were obtained in 1974–75 following fumigation with Telone (1,3-dichloropropene) or D-D in combination with an "at-planting" treatment with Temik 15 G (2-methyl-2-(methylthio)propionaldehyde *O*-(methylcarbamoyl)oxime) in a silty clay soil (Brinkman, Imperial Valley, southern California) (4). Yield increases were greater with fumigant nematicides (D-D or Telone), alone or in combination with the granular Temik 15 G or Furadan 10 G (2-dihydro-2,2-dimethyl-7-benzofuranyl methyl carbamate), than with the granular compounds used alone (3). The five tests reported here were conducted to test effects of chemical control in fields infested with low populations of *H. schachtii*. Four of the five experiments (Chew, Lerno, Doel I, Doel II) were on clay

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TABLE 1. Yield of sugarbeets and pre- and postplant population densities of *Heterodera schachtii* with several chemical treatments at five locations in southern California.

Location and Treatment[a]	Date	Yield (tonnes/ha)	Eggs per 100 g soil			
			Preplant	Sample date	After harvest	Sample date
Suey						
Untreated	3/27/76	91.3	1.5	5/14/76	455	10/27/76
Telone II 112 l/ha		94.4			263	
Telone II 225 l/ha		97.7			107	
Lerno						
Untreated	9/23/75	80.4	4.7	9/23/75	608	6/3/76
Telone II 90 l/ha		78.9			13	
Chew						
Untreated	10/6/75	86.6	23	8/27/75	138	6/20/76
Telone II 101 l/ha		88.5			46	
Doel I						
Untreated	9/18/75	44.8	65	7/3/75	1612	5/27/76
D-D 168 l/ha		50.0	208	8/27/75	1322	
D-D 168 l/ha + Furadan 45 kg/ha		50.1			1333	
D-D 168 l/ha + Temik 30 kg/ha		53.0			1450	
Doel II						
Untreated	9/19/75	38.7	65	7/3/75	847	5/27/76
Furadan 45 kg/ha		46.2			1385	
Temik 30 kg/ha		47.2	208	8/27/75	1040	
D-D 138 l/ha		48.6			1067	
D-D 186 l/ha + Furadan 45 kg/ha		47.6			940	
D-D 186 l/ha + Temik 30 kg/ha		49.1			1187	

[a]Design: All tests were paired comparisons replicated four times except that Doel I was in randomized blocks with three replications.

soils in Imperial Valley, southern California. The fifth experiment (Suey) was on a clay loam soil near Santa Maria, Santa Barbara County, California. Details are given in Table 1.

Testing chemicals against *H. schachtii* in heavily infested fields is suitable for determining the most effective material. Extrapolation of results is hazardous, however, since results may differ in areas where infestation is lighter, making the sugarbeet nematode a less important factor limiting sugarbeet production.

Sugarbeet yields in three experiments in fields with less than 65 eggs/100 g of soil (Table 1) were not influenced appreciably by any nematicide treatment. In the Doel field, where preplanting samples taken on separate occasions contained 65 and 208 eggs/100 g of soil, yields were increased by 5.2 to 8.2 tonnes/ha in one experiment and by 7.5 to 10.4 tonnes/ha in another. Yield increases following nematicide treatments were much larger in experiments where there were 3,960 eggs/100 g of soil in 1974 and 383 eggs/100 g of soil in 1975 (3).

From those results, the economic threshold for *H. schachtii* on sugarbeets is about 150 eggs/100 g of soil (1).

Some fields infested with *H. schachtii* are being treated unnecessarily with nematicides. A rapid and effective soil sampling method, e.g., by an automatic surface sampler (2), would reduce costs of sampling, allowing more samples in fields or parts of fields.

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