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GERMINATION OF RAPE SEED AFTER BURIAL IN SOIL OF SUBGERMINATION MOISTURE CONTENT[1]

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Introduction

Wallace (1) has shown, in carefully conducted experiments, that the subsequent germination of cereal seeds is usually greatly reduced after burial in soils of subgermination moisture content, This loss in germinability was found to be correlated with injuries to the seed coat during, or subsequent to, threshing. Other factors such as growth cracks, sprouting and frost injuries may also adversely affect germination. It was shown that the reduced germination after incubation in "dry" soil of subgermination moisture content was caused by seed-rotting organisms such as Penicillium, Aspergillus, Rhizopus and Mucor. Seed treatment with fungicides improved the germination of cereal seeds in moist soil after the "dry" soil treatment, but germination never equalled that of untreated seed sown in moist soil.

Saskatchewan-grown rape seed, of both the Argentine (Brassica napus L, var. annua Koch) and the Polish (B. campestris L.) types has a relatively high germination rate, comparable with that of cereals and flax. This suggested that the subsequent germination of rape seed sown in soils of subgermination content should be tested by Wallace's methods,

Materials and Methods

Air-dry soil was moistened with 8 per cent water by weight. This was used as the "dry" soil of subgermination moisture content, Wallace's Petri-dish method was used as follows: a layer of "dry" so91 was placed in a Petri dish and 50 rape seeds were sown on its surfade. The seeds were covered with more of the same soil and the Petri dish cover was pressed down to pack the soil. After 9 days the seeds were removed and tasted for germination by plating on moist filter paper or in moist soil. At the same time one lot of seed treated with Ceresan M and one treated with Orthocide 75 were subjected to the "dry soil germination test." Untreated seed samples were also germinated on moist filter paper or in moist soil.

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Results

In the first test the samples of rape seed used came from the Black Soil area of the province and were obtained from the Seeds Branch, Plant Products Division, Canada Department of Agriculture, Saskatoon. The majority of them had been submitted by Registered Seed growers. The results of the test are presented in Table 1.

Table 1. Germfnafion of untreated and fungicide-treated rape seed after burial in "dry" soil.

Sample No.	Type	Germination "Moist" soil	Germination "Dry" soil		
				Treated with	Treated with
No.	Type	Uptreated	Untreated	Ceresan M	Orthocide 75
		%	%	%	%
69-1273	Argentine	99	98	96	99
69-1934	Argentine	83	80	73	79
69-896	Polish	100	100	99	100
69-1158	Polish	99	98	100	100
69-1132	Argentine	99	95	97	93
69-2372	Tetra-Polish	99	83	76	72
69-2828	Polish	100	99	98	100
69-1929	Polish	50	57	53	44
69-1275	Argentine	97	100	76	99
69-1935	Tetra-Polish	93	94	93	93
	Average	31.9	90.4	86.1	87.9
Wheat	Selkirk	100	53		
Flax	Norland	100	68		

The similarity of the results obtained in both the "moist" and "dry" soils in the first test suggested that special care may have been taken to prevent seed injury during threshing of the Registered Seed samples, and that tests on commercial seed might give different results. Table 2 presents the results obtained when 4 commercial seed samples from the Canadian Government Elevators, Ssskatoon, and 8 samples from the Saskatchewan Wheat Pool, Saskatoon, were subjected to the "dry soil" germination teat.

Table 2. Germination of commercial rape-seed samples after burial in "dry" soil

Sample	Cermination "Moist" soil	"Dry" soil
	%	%
Government Elevators, Saskatoon		
80-car average	97	95
Argentine - small	96	89
Argentine - large	96	75
Spring - "mixed"	34	58
Wheat Pool, Saskatoon		
671 - Marcelin	59	70
672 - Humboldt	88	87
673 - Humboldt	61	88
676 - Dewberry	90	80
682 - Tisdale	60	45
683 - Sutherland	90	93
685 -	60	55
- North Battleford	95	94
Average	92.6	92.9

Discussion

The subjection of Argentine and Polish rape-seed samples to "dry" soil conditions for 9 days had no obvious ill effects on subsequent germination in "moist" soil. Seed dressings applied prior to the "dry soil germination test" produced results slightly more irregular than those obtained with untreated seed, but of a similar order. The cause of the reduction in germination of sample 69-2372 is not known. The germination of sample 69-1929, the only one with a low initial rate of germination under moist conditions, was not improved by seed dressings, though an increase might have been expected, Unpublished results of three years' testing of the effects of seed dressings on rape seed have also been irregular and inconsistent both in the greenhouse and in the field. In only relatively few samples was germination significantly improved by seed dressings. The results obtained with wheat and flax (Table 1) are in agreement with those of Wallace (1).

The results obtained with commercial seed (Table 2) were more irregular than with the better samples (Table 1), but again the subsequent germinability of rape seed was not affected by sowing in "dry" soil. It is indicated, by these experiments, that if rape seed is sown in dry soil in the field, little or no ill effect is to be expected when moisture conditions Improve, The results reported here, together with the unpublished results of seed-dressing tests referred to above, indicate that the majority of rape seed samples in Saskatchewan are relatively free from mechanical injuries.

The high average laboratory germination rate of rape seed compared with the average rates for cereals and flax is further evidence in support of this.

Acknowledgements

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SOIL FUMIGATION FOR THE CONTROL OF THE NORTHERN ROOT-KNOT NEMATODE, MELOIDOGYNE HAPLA, ON CELERY[1]

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Abstract

Celery infested with the northern root-knot nematode, Meloidogyne hapla Chitwood, 1949, was treated with Telone, D-D, W-85 and Nemagon. Each treatment significantly reduced the occurrence of galls on the roots with a resultant increase in fresh top weight,

Introduction

The celery block on the Research Laboratory farm at St. Catharines, Ontario, has been used for experiments on the control of early and late blight for twenty-five years, During that time the block has become infested with the northern root-knot nematode, Meloidogyne hapla Chitwood, 1949. To improve the impoverished growth of celery caused each year by M. hapla the soil has been treated with a number of soil fumigants. This paper presents the results obtained in 1957,

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