Cooperative seed treatment trials - 1975'

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Twenty-four seed treatment chemicals were tested at two locations for their efficacy in controlling bunt of wheat [*Tilletia caries* and *T. foetida*], covered smut of oats [*Ustilago kolleri*], and covered smut of barley [*U. hordei*] and for their effects on the emergence of flax. Smut infection of untreated seed was low with the exception of 25% bunt at Brandon. Vitaflo 280 and 18 other treatments gave significantly reduced levels of bunt and of oat and barley smut at both stations. Flax emergence was significantly increased after treatment with CFG 3000. Bay-meb 6447 at the 5.00 and 10.00 g/kg and 26019 RP at the 1.50 g/kg rate reduced flax emergence.

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On a evalue a deux endroits differents l'efficacite de 24 produits de traitement des semences contre la carie du ble (*Tilletia caries* et *T. foetida*) et les charbons couverts de l'avoine (*Ustilago kolleri*) et de l'orge (U. *horde!),* ainsi que l'effet de ces produits sur la levee du lin. Les semences non traitees ont peu souffert du charbon, mais a Brandon 25% ont ete attaquees par la carie. Le Vitaflo 280 et 18 autres traitements ont significativement reduit la frequence de la carie et des charbons de l'avoine et de l'orge aux deux stations. Le traitement au CFG 3000 a fortement augmente le taux de levee du lin, mais l'application de Bay-meb 6447 aux taux recommandes de 5.00 et 10.00 g/kg ou de 26019 RP a 1.50 g/kg l'a reduit.

In 1975, 24 seed treatment chemicals were tested for their efficacy in controlling common bunt of wheat *[Tilletia foetida* (Wallr.) Liro and *T. caries* (DC.) Tul.], covered smut of oats *[Ustilago kolleri* Wille], and covered smut of barley [*U. hordei* (Pers.) Lagerh.] and for their effects on the emergence of flax under Manitoba conditions.

Materials and methods

The chemical composition, where available, and the product name and source of the materials used are listed in Table 1. Vitaflo 280 was included as a comparison standard.

Seeds of 'Norteno M67' wheat *(Triticum aestivum* L.), 'Random' oats *(Avena sativa* L.), and 'Herta' barley *(Hordeum distichon* L.) were used in the smut tests. 'Raja' flax *(Linum usitatissimum* L.) was used for emergence tests.

Prior to chemical treatment the cereals were inoculated with the appropriate dry smut spores at the rate of 1 g per 200 g of wheat, oats, or barley seed. The chemical dosages used were those suggested by the manufacturer (Table 2). Each sample was hand-shaken in a glass jar to cover the seed uniformly with the chemical. After 3 days or more, 200 seeds were removed from each jar and placed in a paper envelope. Envelopes that contained seed of the same treatment were stored in polyethylene bags at 15°C for up to 4 weeks before seeding.

Tests were carried out at Brandon and duplicated at Morden, Manitoba. There were four replicates at each location. Each replicate consisted of 200 seeds planted in a row 4 m long; all rows were planted 25 cm apart; plots were arranged in a randomized block design. Emergence of flax was recorded 3-4 weeks after seeding.

At Brandon, wheat and oats were sown on May 12 and May 26 respectively and barley and flax on May 27; at Morden wheat and oats were sown on May 15 and May 22, and barley and flax on May 28.

The number of smutted heads in each row was recorded after the crop had headed and are expressed as means of the number of heads in the untreated rows. The results are given as means of four replicates, at each planting site. The "LSD-05" was determined from the means of the treatments at each station.

Results and discussion

Smut infection of untreated seed varied from 3% to 25% for wheat, from 4% to 8% for oats, and from 1% to 3% for barley.

The comparison standard Vitaflo 280 and 18 other treatments gave significantly reduced levels of bunt, and of oat and barley smut at both stations.

Phytotoxicity was observed on wheat at both stations after treatment with Bay-meb 6447 at the 5.00 and 10.00 g/kg rates.

Emergence of untreated flax varied from 48% to 59% (Table 2). Flax emergence was significantly increased

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with CFG 3000 at Morden and Brandon. Bay-meb 6447 at the 5.00 and 10.00 g/kg rates and 26019 RP at the 1.50 g/kg rate significantly reduced emergence at both stations.

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Table 1. Seed treatment materials used in the cooperative tests

Treatment no.	Source*	Product name	Active ingredient
1		Untreated check	
2	Chemagro	Bay-meb 6447	1-(4-chlorophenoxy)-3,3-dimethyl-1(1H-1,2,4-triazol-1-yl)-2-butanone (25%)
3	Chipman	TF 3262	pyracarbolid 10% + maneb 16.7%
4	Chipman	TF 3309	maneb 25.0%
5	Ciba-Geigy	CFG 2980	identity not available
6	Ciba-Geigy	CFG 2990	identity not available
7	Ciba-Geigy	CFG 3000	identity not available
8	Ciba-Geigy	CFG 3010	identity not available
9	DuPont	DPX 12	identity not available
10	DuPont	DPX 14	identity not available
11	Interprovincial	Busan 25D	2-(thiocyanomethylthio) benzothiazole (25%)
12	Interprovincial	Busan 30L	2-(thiocyanomethylthio) benzothiazole (30%)
13	Interprovincial	BL 1794-30	identity not available
14	May & Baker	26019 RP	(1-(isopropylcarbamoyl)-3-(3,5-dichlorophenyl hydantoin)
15	Merck	Me 125	identity not available
16	Nor-Am	SN 43493	identity not available
17	Nor-Am	SN 49183	identity not available
18	Rohm & Haas	RHC 366	identity not available
19	Uniroyal	Vitaflo 280	Vitavax (carbathiin) 14.9% + thiram 13.2%
20	Uniroyal	UBI 2067	identity not available
21	Uniroyal	UBI 2078	identity not available
22	Uniroyal	UBI 2079	identity not available
23	Uniroyal	UBI 2080	identity not available
24	Uniroyal	UBI 2083	identity not available
25	Uniroyal	UBI 2085	identity not available
26		Untreated check	

*Chemagro Ltd., Mississauga, Ontario; Chipman Chemicals Ltd., Hamilton, Ontario; Ciba-Geigy Canada Ltd., Cambridge (Galt) Ontario; E.I. DuPont de Nemours & Co., Inc., Wilmington, Delaware; Interprovincial Cooperatives Ltd., Winnipeg, Manitoba; May & Baker (Canada) Ltd., Montreal, Quebec; Merck Sharp and Dohme, Rahway, New Jersey; Nor-Am Agricultural Products Inc., Woodstock, Illinois; Rohm & Haas Co. of Canada Ltd., West Hill, Ontario; Uniroyal Chemical Division, Elmira, Ontario.

Table 2. Effects of seed-treatment chemicals on smuts in wheat, oats, and barley and emergence of flax

Treatment no.	Product name	Formulation**	Dosage (g or ml/kg)	Mean no. smutted heads†						Emergence??	
				Wheat		Oats		Barley		Flax	
				B**	M**	B**	M**	B**	M**	B**	M**
1	Untreated check			38.75	10.25	20.50	15.25	14.25	1.00	101.00	111.25
2	Bay-meb 6447	WP	5.00	0	0	0	0	0	0	72.75	82.25
			10.00	0	0	0	0	0	0	51.25	69.50
3	TF 3262	SL	1.04	0.25	0.75						
			4.12			0	0				
			2.92					0	0		
4	TF 3309	SL	1.73	0	0						
			4.50			0.75	0				
			3.22					0	0		

Table 2 (Cont'd)

Treatment no	Product name	Formulation	Dosage (g or ml/kg)	Mean no smutted heads† Wheat B	Wheat M**	Oats B**	Oats M**	Barley B**	Barley M**	Emergence†† Flax B**	Flax M**
5	CFG 2980	WP	2.08	1.25	0						
			3.67			0	0.75				
			2.60					0	0		
			4.46							117.75	146.75
6	CFG 2990	WP	2.08	1.00	0						
			3.67			1.75	0.75				
			2.60					0.75	1.75		
			4.46							112.25	122.25
7	CFG 3000	WP	2.08	1.75	0						
			3.67			1.00	1.50				
			2.60					0	0		
			4.46							130.00	143.75
8	CFG 3010	WP	2.08	1.50	0						
			3.67			0	0.50				
			2.60					0	0		
			4.46							110.75	113.00
9	DPX 12	WP	2.08	0	0						
			3.70			0	0				
			2.60					0	0		
			2.25							111.00	112.75
10	DPX 14	WP	2.08	0	0.75						
			3.70			0	0				
			2.60					0	0		
			2.25							116.25	124.75
11	Busan 25D	D	2.10	2.00	1.50						
			3.67			0	0.50				
			2.60					0	0		
			4.45							112.50	125.00
12	Busan 30L	SN	0.80	0.25	0.50						
			1.37			0	0.50				
			0.97					0.25	0		
			0.83							101.75	112.50
			1.10							102.25	109.00
13	BL 1794-30	SN	1.56	1.50	0.25						
			2.34	2.25	1.00						
			2.75			1.00	0.75				
			4.13			0.25	0				
			1.95					1.50	0		
			2.92					0	0		
			1.67							70.75	105.25
			2.79							82.50	111.00
14	26019 RP	WP	1.50	0	0					78.50	100.00
			2.00	0	0					80.25	98.00
15	Me 125	SN	0.66	11.00	1.75	9.50	13.50	8.00	2.75	80.00	104.00
			1.32	17.75	2.50	16.00	10.75	10.25	6.50	80.25	99.25
16	SN 43493	WP	2.10	0	0						
			3.90			3.00	2.25				
			2.30					6.50	1.50	104.00	116.00
17	SN 49183	WP	2.10	0	1.50						
			3.90			0.75	1.75				
			2.30					0	0	119.50	137.50
18	RHC 366	SL	0.52	0.25	0.50						
			1.04	0	0						
			2.08	0	0						
			0.92			4.00	7.75				
			1.84			0.50	4.75				
			3.68			0	0.25				
			0.66					0	0.25		
			1.31					0	0		
			2.62					0	0		
			1.12							102.00	123.25
			2.24							119.75	123.75

Table 2 (cont'd)

Treatment no.	Product name	Formulation*	Dosage (g or ml/kg)	Mean no. smutted heads† Wheat B**	Wheat M**	Oats B**	Oats M**	Barley B**	Barley M**	Emergencett Flax B**	Flax M**
			4.48							120.50	128.25
19	Vitaflo 280	SL	1.82	0	1.00						
			3.22			0.25	0				
			2.28					0	0		
			3.90							106.50	122.50
20	UBI 2067	WP	2.75			0	0				
			1.95					0	0		
21	UBI 2078	SL	1.56	0	0						
			2.76			0	0				
			1.95					0	0		
			3.34							114.75	104.00
22	UBI 2079	SL	1.39	2.00	2.75						
			2.45			0	0.50				
			1.73					0	0		
			2.79							94.25	109.75
23	UBI 2080	SL	0.72	1.50	1.00						
			1.27			0	0				
			0.90					0	0		
			1.54							105.50	115.50
24	UBI 2083	SL	1.82	0.50	1.00						
			3.22			0	0				
			2.28					0	0		
			3.90							104.75	109.00
25	UBI 2085	SL	3.22			0	0.25				
			2.28					0	0		
26	Untreated check			46.75	12.25	16.25	18.00	10.25	2.75	97.00	118.75
LSD (0.05)				7.76	2.83	4.42	3.63	3.91	1.65	22.81	15.26
Mean no. of heads				187	447	237	357	468	557		

*Formulation code: D = dust, SN = solution, SL = slurry, WP = wettable powder

**B = Brandon
M = Morden

†$\%\ \text{smut} = \frac{\text{mean no. smutted heads}}{\text{mean no. of heads}} \times 100$

††Flax emergence based on mean of 4 reps each having 200 seeds planted