

Management of Dwarf Bunt and Other Yield Limiting Wheat Diseases in Ontario

(Interim Report)

Purpose:

To select and compare the effectiveness of fungicidal seed treatments for the control of dwarf bunt and to evaluate Ontario winter wheat cultivar lines for potential resistance to dwarf bunt.

Methods:

1. Research plots were established and inoculated in two locations (Bornholm and Palmerston) in the fall of 2002. Although dwarf bunt also developed at a third research location (Perth County demonstration farm) disease levels were too low to properly compare treatments. Six treatments were included: three rates of Dividend (low, medium, high), Vitaflo280, a biological agent (ACM941), and an untreated control. The results from 2002-2003 trials are summarized in Table 1.
2. 168 winter wheat lines were provided by 9 research programs in 2002/2003 and evaluated at two inoculated sites (Bornholm, Palmerston) against dwarf bunt.

Results:

Table 1. Effect of seed treatments on emergence, dwarf bunt infection, and yield of winter wheat at Bornholm and Palmerston in 2003*

Treatment (mL/kg seed)	Emergence (%)			Dwarf bunt infection (%)			Yield (kg/ha)		
	Bornholm	Palmerston	Mean	Bornholm	Palmerston	Mean	Bornholm	Palmerston	Mean
Untreated	47.8 b	73.0 d	60.4 d	11.8 a	11.8 a	11.8 a	4242 a	4678 a	4460 b
Dividend (3.25)	56.6 a	81.6 c	69.1 b	0.1 c	0.1 c	0.1 d	4499 a	4807 a	4653 a
Dividend (6.50)	57.3 a	87.4 a	72.4 a	0.0 c	0.1 c	0.1 d	4443 a	4686 a	4565 ab
Dividend (9.75)	56.8 a	85.8 ab	71.3 ab	0.2 c	0.1 c	0.2 d	4489 a	4767 a	4628 a
Vitaflo 280 (2.60)	56.8 a	83.1 bc	69.9 ab	3.7 b	6.9 b	5.3 c	4493 a	4780 a	4636 a
ACM941 (10 ⁶ cfu/mL)	47.7 b	83.9 abc	65.8 c	9.1 a	9.4 ab	9.2 b	4280 a	4663 a	4472 b

*Data are means of eight cultivars and four replicates per cultivar at each site. Means in a column followed by the same letter are not significantly different at $P = 0.05$ (LSD).

Summary:

All seed treatments increased emergence by 8.9 to 19.8%, which was significantly better than the untreated control plots. The three rates of Dividend (14.4-18.8%) and Vitaflo 280 (15.7%) were all more effective than the biological agent, ACM941 (8.9%) in improving emergence. All seed treatments significantly reduced the incidence of dwarf bunt. Dividend was significantly better at controlling dwarf bunt (98.3 to 100%) than the other treatments but there were still trace amounts in some of the plots. No statistical differences were observed among the three application rates used for Dividend. Vitaflo 280 reduced the disease incidence by more than 55%, while the biological agent (ACM941) was partially effective and only reduced the disease by 22% when they were compared to the untreated controls. Dividend and Vitaflo 280 seed treatments increased yield by 2.4 to 4.3% (average of two sites) compared to the untreated control (Table 1).

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The biological agent (ACM941) increased yield by only 0.5% when compared to the untreated control. These trials are being repeated in 2004 in three locations (Palmerston, Parkhill and Perth Soil & Crop Demonstration Farm).

Sixty-one lines showed a 0% incidence of dwarf bunt at both sites and were tentatively assigned a resistant rating. These results suggest that resistance to dwarf bunt is available in Ontario and can be incorporated into new cultivars.

Next Steps:

This project will be repeated in 2004.

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Location of Project Final Report:

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