Project Title: Evaluation of Soil Insecticides for OWBM Control

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Objectives: To evaluate the efficacy of soil applied insecticides for the control of the orange wheat blossom midge.

Results:

The experiment was established at the Northwestern Agricultural Research Center located near Kalispell, MT in a field with a previous history of low to moderate midge densities. The soil type was a Creston silt loam (25-50-25) with an organic matter content of 4%, a pH of 7.5, and a CEC of 20 meq/100g. The field was fertilized with 100-30-60-24 lb/A of N, P, K and S, respectively. Freyr spring wheat was planted on May 16 at a seeding rate of 64 lb/A to a depth of two inches.

The treatments consisted of Warrior at 0.03 lb ai/A, Lorsban at 0.5 lb ai/A , and a non-treated check arranged in a randomized complete block design with four replications. Each plot was 15 by 10 feet with rows spaced 7 inches apart. Treatments were applied on June 16, three days after larvae were observed on the soil surface, using a CO_2 backpack sprayer in 20 GPA of water using Tee Jet 11002 flat fan nozzles. The area was irrigated on June 17 with approximately 0.6 inches of water. Emergence traps were placed in each plot and were monitored on a weekly basis for the presence of adults commencing June 30 and continuing to July 31, 2008. The number of adults captured in each trap was added to arrive at a total emergence number for each plot. Five randomly selected heads were collected on August 11. Each head was dissected and the number of larvae, damaged kernels and healthy kernels were determined. Plots were harvested on September 9, 2008. Grain yield, test weight, moisture, and protein were determined and the number of midge collected as dockage was recorded.

The effect of insecticide applications on adult emergence was marginal (Table 1). Differences among the treatments were not significant at the 5% level of probability. However, Lorsban had lower total numbers relative to Warrior at the 7% level of probability. Any initial advantage afforded by the reduction in adult emergence was apparently offset by recruitment from outside the treated area since insecticide treatments had no effect on larvae per spike, larvae collected as dockage, yield or grain quality. Indeed, yields tended to be highest for Warrior ($P>0.08$), which had the greatest total adult emergence counts. Midge densities averaged about 30 larvae per spike and grain yields averaged 28 bu/A. It appears that when extreme insect pressures exist, soil applied insecticides fail to have any substantial effect in terms of reducing insect densities.

Table 1. Effect of soil insecticides on OWBM control and spring wheat yield and quality at Kalispell, MT.

Planted: May 16, 2008 Field P2 Harvested: September 9, 2008

	Total emergence	Midge larvae		Heading date	Yield	Test weight	Grain moist.	Protein
Insecticide	No./Trap	No./Spike	No./dock[a]	Julian	bu/A	lb/bu	%	%
Warrior	13.8	27.6	2.8	189	30.3	59.6	14.9	14.8
Lorsban	4.6	27.4	3.0	189	27.8	59.0	14.7	14.8
Check	11.3	34.2	3.8	189	25.9	58.7	15.1	15.3
Mean	**9.9**	**29.7**	**3.2**	**189**	**28**	**59.1**	**14.9**	**15.0**
C.V. (%)	**64**	**41**	**81**	**21**	**10**	**1.3**	**4**	
LSD (0.05)	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	
Model P>F	0.14	0.47	0.42	0.35	0.02	0.39	0.04	
TMT P>F	0.07	0.65	0.80	0.30	0.08	0.23	0.38	
LSD	8.9	16	3.5	0.55	3.9	1.1	0.82	

[a] Refers to the number of midge larvae collected as dockage.