

Project Title: Sm1 Interspersed Refuge Evaluation -2013

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Objective: To evaluate the efficacy and agronomic performance of the interspersed refuge system.

Results:

The purpose of the interspersed refuge system is to delay the selection of virulent, Sm1 resistant, midge populations. The refuge, or susceptible variety, is blended with the midge resistant variety at a ratio of 1:10. The combination is then planted together in an effort to maintain the genetic diversity of the midge population.

In this study, CAP 34-1 and CAP 400-1 contain the Sm1 gene for OWBM resistance, while Solano and Choteau are midge susceptible varieties. These four cultivars were planted alone and as blends (Table 2), where the CAP lines comprise 90% of the blended mixtures.

Despite modest midge pressure during heading, differences were detected among varieties. The non-resistant varieties, Solano and Choteau, had significantly higher number of larvae compared to the Sm1 resistant CAP lines. The CAP lines, alone or blended, resulted in 86% to 100% midge mortality. The blend of CAP 400-1 & Choteau resulted in a 19.1 bu/A increase over Choteau. These results demonstrate that the interspersed refuge can allow a low number of owbm to reproduce without sacrificing grain yield.

Table 1. Materials and Methods - Sm1 interspersed refuge system - 2013.

Seeding Date:	5/6/13	Fertilizer:	150-40-110-20
Julian Date:	126	Herbicide:	5/31/13
Seeding Rate:	80 lb/A		Affinity TankMix 0.6 OZ/A, MCPE
Previous Crop:	Barley		0.5 PT/A, Axial 16.4 FL OZ/A
Tillage:	Conventional	Fungicide:	6/21/13
Irrigation:	None		Headline 9 FL OZ/A
Soil Type:	Creston Sil	Harvest Date:	9/13/13
Soil Test:	162-14-142	Julian Date:	256

Table 2. Agronomic data for the efficacy of the Sm1 interspersed refuge system - 2013.

Treatment	HD Julian	SR %	HT in	LOD %	YLD bu/A	PRO %	TWT %	OWBM no/spk	TKW g	MC %
SOLANO	184	2.3	31.8	0.0	84.2	15.2	58.9	11.9	37.9	13.2
CHOTEAU	182	4.0	37.3	0.0	73.5	15.5	58.5	13.4	34.0	13.3
CAP 34-1	182	5.0	35.8	0.0	88.6	13.1	59.9	0.0	33.2	14.0
CAP 400-1	184	0.0	38.5	0.0	95.8	15.5	60.1	0.0	32.9	13.8
CAP 34-1 & SOLANO	182	4.3	35.7	0.0	90.0	13.4	59.9	0.0	34.2	13.9
CAP 34-1 & CHOTEAU	182	4.0	36.0	0.0	88.2	13.4	59.9	1.8	34.1	14.0
CAP 400-1 & SOLANO	183	0.0	38.1	0.0	91.5	15.6	60.0	0.0	32.2	13.8
CAP 400-1 & CHOTEAU	183	0.7	38.5	0.0	92.6	16.1	59.7	0.0	32.8	13.7
Mean	182.7	2.5	36.4	0.0	88.0	14.7	59.6	3.4	33.9	13.7
CV	0.2	72.4	2.3	0.0	5.6	4.4	0.6	94.8	3.3	0.9
LSD	0.6	3.2	1.5	0.0	8.7	1.1	0.6	5.6	1.9	0.2
Pr>F	0.0001	0.0162	0.0001	1.0000	0.0030	0.0001	0.0006	0.0002	0.0007	0.0001

HD: heading, SR: stripe rust, HT: height, LOD: lodging, YLD: yield, PRO: protein, TWT: test weight, OWBM: orange wheat blossom midge, TKW: thousand kernel weight, MC: moisture