

Potential for crop injury in spring wheat when tank mixing several fungicides with several common grass and broadleaf herbicides in 2006 at Crookston, MN. Wiersma, Jochum J., Beverly R. Durgan, and James H. Cameron

A full factorial treatment design consisting of individual and tank mixtures of the postemergence grass herbicides clodinafop & cloquintocet, fenoxaprop-P, and mesosulfuron & mefenpyr and the broadleaf herbicide bromoxynil & MCPA applied at labeled rates, and the fungicides trifloxystrobin & propiconazole (Stratego) and azoxystrobin & propiconazole (Quilt) applied at half the labeled rate were evaluated for their potential to cause crop injury in spring wheat. The experiment was conducted at the Northwest Research & Outreach Center in Crookston, MN on a Wheatville sandy loam (coarse-silty over clayey, mixed over smectitic, superactive, frigid Aeric Calciaquolls). The plot area was chisel plowed the previous fall and a seed bed was prepared in the spring using a field cultivator. Fertilizer was applied according to soil test recommendations for a 60 bu/A yield goal. The hard red spring wheat cv. 'Alsen' was solid seeded to a 1.5 inch depth in three 16 ft strips using a double-disk press drill. The strips were separated by an 8 ft alley. Within each strip, 8 ft wide plots were marked. Treatments were applied to the center 6 ft of the plot using a CO₂ powered backpack sprayer equipped with 80015 flat-fan nozzles delivering 10 GPA at 35 psi. The three solid-seeded strips of Alsen formed the 3 replicates. The application was made at the 3.5 leaf stage of wheat on June 2. Crop injury was rated at 7, 14, 21, and 28 days after application. Grain yield was estimated by harvesting the center 5 ft from each plot with a plot combine. Grain samples were dried and cleaned and grain yield was expressed as bu/A.

Date	Jun 2
Treatment	POST
Sprayer	
GPA	10
psi	35
Temperature (°F)	
air	78
soil (4 inches)	64
Soil Moisture	dry
Wind Speed (mph)	2.0
Sky	Sunny with scattered clouds
Relative Humidity (%)	42
Wheat	
leaf no.	3.5

In the analysis of variance the main effect grass herbicide and 2-way interaction between the factors grass herbicides and bromoxynil & MCPA were significant for crop injury at 7 days after application (data not shown). Thus, only the means of this 2-way interaction are presented in Table 1. Bromoxynil & MCPA in combination with either fenoxaprop-P or clodinafop & cloquintocet did not result in more crop injury than when the grass herbicides were applied separately, whereas mesosulfuron & mefenpyr alone or in combination with bromoxynil & MCPA caused significantly more crop injury at 7 days after application (Table 1). The addition of either fungicide increased the amount of crop of crop injury at 7 days after application of mesosulfuron & mefenpyr in combination with bromoxynil & MCPA (Table 2). This was not observed for any other tank mix combinations. The crop injury was localized to the fourth and fifth leaves and new growth did not show any injury symptoms. At 14 days after application, crop injury had decreased and no crop injury was found at 21 and 28 days after application. The crop injury at 7 and 14 days after application had no effect on final grain yield. However, treatments including any of the three postemergence grass herbicides tended to yield more than the control or the bromoxynil & MCPA treatment. Lack of control of grassy weeds may explain this difference in grain yield.

Table 1 Crop injury at 7 days after application and grain yield of four post emergence grass herbicides and bromoxynil & MCPA and the respective tank mixtures in 2006 at Crookston, MN (Wiersma, Durgan and Cameron).

	Rate (lb/A)	Crop Injury (%)	Grain Yield (bu/A)
Control		0.0	49.2
Bromoxynil & MCPA ¹	0.5	2.2	53.8
Clodinafop & cloquintocet ²	0.05	0.0	57.0
Clodinafop & cloquintocet + bromoxynil & MCPA	0.05 + 0.5	0.6	61.8
Fenoxaprop-P ³	0.075	0.0	58.0
Fenoxaprop-P + bromoxynil & MCPA	0.075 + 0.5	1.7	60.3
Mesosulfuron & mefenpyr ⁴	0.0156 + 1.9%	8.9	60.3
Mesosulfuron & mefenpyr + bromoxynil & MCPA	0.0156 + 1.9% + 0.5	21.1	56.6
LSD (0.05)		4.2	9.2

¹ Bronate Advanced

² Discover NG

³ Puma 1EC

⁴ Silverado

Table 2 Crop injury at 7 days after application and grain yield of mesosulfuron & mefenpyr, bromoxynil & MCPA and combination with the fungicide azoxystrobin & propiconazole (Quilt) or trifloxystrobin & propiconazole (Stratego) applied at half the labeled in 2006 at Crookston, MN (Wiersma, Durgan and Cameron).

	Rate (lb/A)	Crop Injury (%)	Grain Yield (bu/A)
Mesosulfuron & mefenpyr ¹ + bromoxynil & MCPA ²	0.0156 + 1.9% + 0.5	0.0	49.2
Mesosulfuron & mefenpyr + azoxystrobin & propiconazole ³	0.0156 + 1.9% + 0.034 + 0.056	8.3	60.4
Mesosulfuron & mefenpyr + bromoxynil & MCPA + azoxystrobin & propiconazole	0.0156 + 1.9% + 0.5 + 0.034 + 0.056	30.0	55.0
Mesosulfuron & mefenpyr + trifloxystrobin & propiconazole ⁴	0.0156 + 1.9% + 0.041 + 0.041	11.7	51.7
Mesosulfuron & mefenpyr + bromoxynil & MCPA + trifloxystrobin & propiconazole	0.0156 + 1.9% + 0.5 + 0.041 + 0.041	20.0	58.2
LSD (0.05)		7.2	ns

¹ Silverado

² Bronate Advanced

³ Quilt

⁴ Stratego