Potential for crop injury and reduced control of wild oat in spring wheat when tank mixing several fungicides with several common grass and broadleaf herbicides in 2005 at Crookston, MN.

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A randomized complete block treatment design consisting of individual and tank mixtures of the postemergence grass herbicides clodinafop & cloquintocet, fenoxaprop-P, and AEF 103060 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 and reduce wild oat control. The experiment was conducted at the Northwest Research & Outreach Center in Crookston, MN on a Donaldson loam (coarse-loamy over clayey, mixed over smectitic, superactive, frigid oxyaquic Hapludoll). The experimental site has been maintained to provide an even wild oat population. Wild oat pressure exceeded 300 plants/ft^2 in 2005. 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 six 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 CO_2 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 4.0 leaf stage of wheat on June 6. Crop injury on wheat was rated at 7, 14, 21, and 28 days after application. Wild oat control was evaluated at 21 and 28 days after application. Tebuconazole (Folicur 3.6F) was applied at labeled rate at Feekes 10.51 to suppress Fusarium head blight. 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 6
Treatment	POST
Sprayer	
GPA	10
psi	35
Temperature (°F)	
air	63
soil (4 inches)	71
Soil Moisture	wet
Wind Speed (mph)	3.5
Sky	Overcast
Relative Humidity (%)	65
Wheat	
leaf no.	4.0

Bromoxynil & MCPA in combination with any of the three grass herbicides and either fungicide caused significantly more crop injury at 7 days after application then the three grass herbicides individually or in tank mixtures with either fungicide (Table 1). Also, bromoxynil & MCPA in combination with clodinafop & cloquintocet and fenoxaprop-P and either fungicide resulted in less control of wild oat at 28 days after application then the grass herbicides individually or in tank mixtures with either fungicide (Table 1). 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. Wild oat in plots treated with bromoxynil & MCPA in combination with any of the three grass herbicides and either fungicide showed considerable phytotoxicity (necrosis). The observed phytotoxicity in the wild oat was identical to phytoxicity that can be observed in wheat with bromoxynil. Thus, the addition of either fungicide to the tank mix caused the additional crop injury of the bromoxynil & MCPA. Furthermore, the observed necrosis in the wild oat may explain the observed reduced control of wild oat as the necrosis caused by the bromoxynil & MCPA may have reduced uptake or translocation of either of the three grass herbicides. The crop injury at 7 and 14 days after application and the reduced control of wild oat had no effect on final grain yield.

Table 1 Potential for crop injury and reduced control of wild oat in spring wheat when tank mixing several fungicides with several common grass and broadleaf herbicides in 2005 at Crookston, MN (Wiersma, Durgan and Cameron).

	Rate	Crop Injury - 7 DAT -	AVEFA Control - 28 DAT -	Grain Yield
	(lb/A)	(%)	(%)	(bu/A)
Control		0.0	0.0	12.2
Clodinafop & cloquintocet[1]	0.05	6.7	99.7	57.3
Clodinafop & cloquintocet + bromoxynil & MCPA[2]	0.05 + 0.5	18.3	91.7	52.6
Clodinafop & cloquintocet + azoxystrobin & propiconazole[3]	0.05 + 0.034 + 0.056	11.7	99.7	60.6
Clodinafop & cloquintocet + bromoxynil & MCPA + azoxystrobin & propiconazole	0.05 + 0.5 + 0.034 + 0.056	30.0	96.7	49.1
Clodinafop & cloquintocet + trifloxystrobin & propiconazole[4]	0.05 + 0.041 + 0.041	8.3	99.3	58.4
Clodinafop & cloquintocet + bromoxynil & MCPA + trifloxystrobin & propiconazole	0.05 + 0.5 + 0.041 + 0.041	28.3	96.3	53.9
AEF 103060 & adjuvent[5]	0.0156 + 1.9%	10.0	89.7	47.6
AEF 103060 & adjuvant + bromoxynil & MCPA	0.0156 + 1.9% + 0.5	13.3	85.0	46.2
AEF 103060 & adjuvent + azoxystrobin & propiconazole	0.0156 + 1.9% + 0.034 + 0.056	13.3	78.3	41.8
AEF 103060 & adjuvant + bromoxynil & MCPA + azoxystrobin & propiconazole	0.0156 + 1.9% + 0.5 + 0.034 + 0.056	35.0	80.0	45.1
AEF 103060 & adjuvent + trifloxystrobin & propiconazole	0.0156 + 1.9% + 0.041 + 0.041	8.3	83.3	47.8
AEF 103060 & adjuvant + bromoxynil & MCPA + trifloxystrobin & propiconazole	0.0156 + 1.9% + 0.5 + 0.041 + 0.041	35.0	76.7	48.1
Fenoxaprop-P[6]	0.075	8.3	99.3	45.4
Fenoxaprop-P + bromoxynil & MCPA	0.075 + 0.5	15.0	85.0	46.3
Fenoxaprop-P + azoxystrobin & propiconazole	0.075 + 0.034 + 0.056	11.7	99.0	56.6
Fenoxaprop-P + bromoxynil & MCPA + azoxystrobin & propiconazole	0.075 + 0.5 + 0.034 + 0.056	23.3	85.0	44.3
Fenoxaprop-P + trifloxystrobin & propiconazole	0.075 + 0.041 + 0.041	8.3	99.0	52.1
Fenoxaprop-P + bromoxynil & MCPA + trifloxystrobin & propiconazole	0.075 + 0.5 + 0.041 + 0.041	23.3	86.7	47.9
LSD (0.05)		6.5	7.3	11.8

[1] Discover 60 EC
[2] Bronate Advanced
[3] Quilt
[4] Stratego
[5] Silverado
[6] Puma E