

Residual weed control with flumioxazin, pyroxasulfone, metribuzin, mesotrione, and isoxaflutole mixtures at Rosemount, MN - 2018. Gunsolus, Jeffrey L., Douglas W. Miller, Bradley Kinkaid, Ryan Mentz, and Aryane Batista. The objective of this experiment was to evaluate residual weed control with flumioxazin in mixtures with mesotrione or isoxaflutole, with or without metribuzin. The experiment was conducted on a bare ground plot at Rosemount, MN on a Waukegon silt loam (4% sand, 52% silt, 44% clay) with pH 5.4 and 4.3% organic matter. Soil test P and K were 46 and 436 lbs/A, respectively. The previous crop was corn and the area was chisel plowed in the fall of 2017. The area was tilled with a soil finisher on April 30, 2018. On May 3, the area was fertilized with 60 lbs/A P and 60 lbs/A K. The area was field cultivated on May 4 and on May 21. The experimental design was a randomized complete block with four replications and plot size was 12 by 30 ft. On May 22, herbicide treatments were soil applied to a 10 foot wide strip with a tractor mounted, compressed air sprayer with an eight nozzle boom and 15 inch nozzle spacing. Applications were made using 110015VS XR Teejet flat-fan nozzles at 35 psi pressure producing a spray volume of 15 gpa. Plots were visually rated and weed control data are presented in the Table. Application environmental conditions and weed data are presented below.

Treatment Date	May 22
Air Temperature (°F)	73
Relative humidity (%)	59
Dewpoint (°F)	58
Soil Moisture	moist at 1.5"
Soil Temperature (°F)	74
Sky	75% clouds
Wind (mph)	SSE 0-5
Rainfall before Application	
Week 1 (inch)	0.08
Rainfall after Application	
Week 1 (inch)	0.76
Week 2 (inch)	1.71

Weed Densities in untreated check (#/m²)	June 14
Amaranth species*	384
Common Lambsquarters (Colq)	140
Common Ragweed (Corw)	4
Eastern Black Nightshade (Ebns)	165.4

* 90-95% tall waterhemp and 5-10% Powell amaranth

Results

The primary broadleaf weed species present were two amaranth species (90-95% tall waterhemp and 5-10% Powell amaranth) and common lambsquarters. Common ragweed, eastern black nightshade, and velvetleaf were also present but populations were more variable. Grass species (barnyardgrass, giant and yellow foxtail, and woolly cupgrass) were also present but populations were highly variable and no control ratings are presented.

Initial control of amaranth species was slightly lower with Zidua, Tricor and Callisto compared to the other treatments. Fierce, Fierce MTZ, and the Callisto and Balance Pro tank mix combinations all maintained excellent residual control of amaranth species throughout the ratings period (July 17). Control remained good for Valor SX, Zidua, and Tricor by July 17. Amaranth control with Balance Pro alone declined after the June 29 rating while control with Callisto alone began to decrease after the June 22 rating.

Common lambsquarters control was poor with Zidua at all rating dates. Initial control of common lambsquarters was generally excellent for the other treatments. In particular, lambsquarters control was 100% with all of the Balance Pro treatments and the Callisto tank mixes. Residual control with these treatments remained excellent through July 17. Fierce and Tricor maintained good lambsquarters control through July 17. Lambsquarters control was fair with Valor SX and Fierce MTZ by the July 17 rating date.

Common ragweed control was poor with Zidua at all rating dates. Initial control of common ragweed was generally excellent for the other treatments. Residual control of common ragweed was poor with Valor SX by July 17 and only fair with Callisto alone and Fierce. The combination of Valor SX plus Callisto resulted in improved common ragweed control compared to each product alone. Tricor, Fierce MTZ, three and four-way combinations of Callisto plus Valor SX with Tricor and Zidua, and all of the Balance Pro treatments resulted in excellent residual control of common ragweed.

Eastern black nightshade control was poor with Tricor at all rating dates. All other treatments provided excellent early control of black nightshade. Residual control with was slightly less with Zidua and Callisto alone at the July 17 rating. All other treatments maintained excellent residual control of eastern black nightshade.

Velvetleaf control was poor with Zidua at all rating dates. Initial control of velvetleaf was excellent for all other treatments. Residual control of velvetleaf decreased with time for Valor SX, Tricor, Fierce, Fierce MTZ, and Balance Pro alone. Callisto alone, Callisto tank mixes, and Balance Pro tank mixes maintained excellent residual control of velvetleaf.

Residual weed control with flumioxazin, pyroxasulfone, metribuzin, mesotrione, and isoxaflutole mixtures at Rosemount, MN - 2018 (Gunsolus, Miller, Kinkaid, Mentz, and Batista).

Treatment	Rate (product/A)	Weed Control																			
		amaranth spp. ¹				Colq				Corw				Ebns				Vele			
		6/13	6/22	6/29	7/17	6/13	6/22	6/29	7/17	6/13	6/22	6/29	7/17	6/13	6/22	6/29	7/17	6/13	6/22	6/29	7/17
Valor SX ²	2.45 oz	100	99	98	91	95	94	90	78	99	84	70	60	100	100	100	100	95	90	84	78
Zidua ³	1.51 oz	97	94	95	90	35	25	25	15	33	10	10	10	100	98	96	96	45	45	26	20
Tricor ⁴	8 oz	98	96	95	89	98	95	96	93	88	99	98	98	30	39	19	10	96	85	84	80
Fierce ⁵	3.75 oz	100	100	100	97	99	99	98	93	99	98	90	85	100	100	100	100	100	99	98	86
Fierce MTZ ⁶	1 pt	100	100	100	97	99	95	92	80	100	99	99	98	100	100	100	100	98	94	92	75
Callisto ⁷	3 oz	97	96	92	68	98	97	97	95	95	99	75	75	100	100	98	98	99	100	100	98
Valor SX + Callisto	2.45 oz + 3 oz	100	100	99	98	100	100	100	98	95	95	96	91	100	100	100	100	100	100	100	100
Valor SX + Callisto + Tricor	2.45 oz + 3 oz + 8 oz	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98
Valor SX + Callisto + Zidua	2.45 oz + 3 oz + 1.51 oz	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Valor SX + Callisto + Zidua + Tricor	2.45 oz + 3 oz + 1.51 oz + 8 oz	100	100	100	99	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	98
Balance Pro ⁸	3 oz	100	100	99	81	100	100	100	98	100	100	100	100	100	100	100	99	99	97	92	91
Valor SX + Balance Pro	2.45 oz + 3 oz	100	100	100	98	100	100	100	100	99	100	100	99	100	100	100	100	100	100	100	99
Valor SX + Balance Pro + Tricor	2.45 oz + 3 oz + 8 oz	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	99
Valor SX + Balance Pro + Zidua	2.45 oz + 3 oz + 1.51 oz	100	100	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Valor SX + Balance Pro + Zidua + Tricor	2.45 oz + 3 oz + 1.51 oz + 8 oz	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
LSD (0.05)		1.3	2.9	2.8	4.5	6.5	6.6	6.6	6.7	13.1	8.5	15.3	16.5	5.2	15.4	7.9	2.1	12.7	14.9	14.9	15.0

¹ 90-95% tall waterhemp and 5-10% Powell amaranth.

² Valor SX 51WG = flumioxazin (2.45 oz product/A = 1.25 oz ai/A flumioxazin).

³ Zidua 85WG = pyroxasulfone (1.51 oz product/A = 1.28 oz ai/A pyroxasulfone).

⁴ Tricor 4L = metribuzin (8 oz product/A = 4 oz ai/A metribuzin).

⁵ Fierce 76WDG = 33.5% flumioxazin & 42.5% pyroxasulfone (3.75 oz product/A = 1.26 oz ai/A flumioxazin & 1.6 oz ai/A pyroxasulfone).

⁶ Fierce MTZ 2.64 SC = flumioxazin & pyroxasulfone & metribuzin (1 pt product/A = 1.0 oz ai/A flumioxazin & 1.28 oz ai/A pyroxasulfone & 3 oz ai/A metribuzin).

⁷ Callisto 4L = mesotrione (3 oz product/A = 1.5 oz ai/A mesotrione).

⁸ Balance Pro 4SC = isoxaflutole (3 oz product/A = 1.5 oz ai/A isoxaflutole).