Green Section: Weed Control in Small Grains Page #

Barley Response to Pxsf. Dr. Howatt and Mettler. Experiment was established in Fargo near the airport on May 18, 2021. Treatments were applied PRE to bare ground. Treatments were applied at 9:00AM at 72°F, 57% relative humidity, 0% cloud-cover, 7 mph wind velocity at 180°, and dry soil surface at 63°F. Herbicides were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	6/3 Bar	6/10 Bar	6/23 Bar	6/23 Wahe
	--OZ AI/A, %V--	----------% Control----------			
Untreated Check		0	0	0	0
Pxsf&Carf (Anthem Flexx)	1	0	0	0	74
Pxsf&Carf	1.5	0	0	0	80
Pxsf&Carf	1.75	0	0	0	80
Pxsf&Carf	2	0	0	0	84
Pxsf&Carf	2.5	0	0	0	85
CV:		0	0	0	4
LSD P=0.05		.	.	.	4

Wahe: Waterhemp, Bar: Barley.

Volunteer Hemp Control in Small Grains. Dr. Howatt and Mettler. Hemp cultivar Canda was planted on May 28, 2021. Treatments were applied to hemp at 4 to 5 leaf pairs stage on June 24. Application started at 9:00AM at 81°F, 56% relative humidity, 5% cloud-cover, 2 mph wind velocity at 165°, and dry soil surface at 70°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

Treatment	Rate	7/9 Hemp	7/20 Hemp
	--OZ AI/A, %V--	-------% Control------	
Untreated Check		0	0
Flox-C	1.5	86	82
Brox&Flox (Starane NXT)	5	84	76
Flox&Haux (Pixxaro) + NIS	1.8 + 0.25%	91	92
Haux (Elivore) + NIS	0.075 + 0.25%	85	85
Haux&Flas (Quelex) + NIS	0.15 + 0.25%	85	79
2,4-DP (Dcpp)	8	85	74
Brox-2 + 2,4-DP	4 + 6	72	57
Carf + 2,4-DP + NIS	0.128 + 6 + 0.25%	79	69
Brox&Pyst(Huskie)	3.4	86	84
Brox&Flox&Pyst (Huskie FX)	4.3	91	89
Thif-sg + Trib-sg + NIS	0.15 + 0.15 + 0.25%	91	95
Flucarbazone-3 + BB	0.35 + 1%	66	45
Pyroxsulam + BB	0.21 + 1%	90	87
Thiencarbazone (Varro) + BB	0.072 + 1%	93	96
CV:		3	4
LSD P=0.05		3	4

Tiafenacil Burndown Before Wheat. Dr. Howatt and Mettler. Experiment was established on a non-cropped area on May 18, 2021. Treatments were applied to 1-to-2 leaf wild oat and 1-to-2 leaf wild buckwheat at 7:35AM at 68°F, 60% relative humidity, 0% cloud-cover, 6-8 mph wind velocity at 180°, and dry soil surface at 60°F. Herbicides were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates. *Treatment 5 did not mix well into solution (small white flecks).

	Treatment	Rate	5/25 Wioa	5/25 Wibw	5/28 Wioa	5/28 Wibw	6/4 Wioa	6/4 Wibw
		---OZ AI/A, %V---	----------% Control----------					
1	Untreated Check		0	0	0	0	0	0
2	Gly-4.5 + AMS	12 + 11	81	62	89	76	99	99
3	Tiafenacil + MSO	0.35 + 0.25%	19	55	30	62	14	74
4	Tiafenacil + MSO	0.7 + 0.25%	25	67	45	84	15	96
5	Tiafenacil+Gly-4.5+AMS+MSO	0.35+12+11+0.25%	89	84	96	94	99	99
6	Flcz-P + NIS	0.21 + 0.25%	25	35	47	52	60	77
7	Flcz-P Gly-4.5 + AMS	0.21 + 12 + 11	84	65	91	84	99	99
8	Clet + AMS + COC	1 + 11 + 1%	55	0	77	0	89	20
9	Flcz-3 + AMS + NIS	0.42 + 11 + 0.25%	30	50	47	57	67	67
	CV:		10	11	10	9	4	4
	LSD P=0.05		7	8	9	7	4	4

Wioa: Wild Oat, Wibw: Wild Buckwheat

Comments:

Soil Herbicide Management of Foxtail and Waterhemp. Dr. Howatt and Mettler. Linkert wheat was planted near Fargo May 4, 2021. PRE-treatments were applied on May 5, 2021 at 8:25AM at 49°F, 47% relative humidity, 100% cloud-cover, 6 mph wind velocity at 315°, and dry soil surface at 46°F. PRE-herbicides were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. POST-treatments were applied to 3-to-4 leaf wheat, cotyledon venice mallow, cotyledon pigweeds, and 1 to 2-inch common lambsquarters. POST-treatments were applied on June 3, 2021 at 12:50PM at 94°F, 27% relative humidity, 40% cloud-cover, 7 mph wind velocity at 315°, and dry soil surface at 69°F. POST-herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/3 Wht	6/9 Wht	6/9 Pgwd	6/9 Colq	6/9 Vema
		----OZ AI/A, %V----	----------% Control----------				
1	**Saff** / Brox&Pyst	**1.1** / 3.4	0	0	99	99	99
2	**Pend-h** / Brox&Pyst	**22** / 3.4	0	0	99	99	96
3	**Pxsf-sc** / Brox&Pyst	**2** / 3.4	0	0	99	99	97
4	**Acet-w** / Brox&Pyst	**24 /** 3.4	0	0	99	99	97
5	**Dime** / Brox&Pyst	**18 /** 3.4	0	0	99	99	99
6	**Meto-D2M** / Brox&Pyst	**24 /** 3.4	0	0	99	98	95
7	**Mest** / Brox&Pyst	**1.5 /** 3.4	0	0	99	99	96
8	Brox&Pyst	3.4	0	0	93	94	93
9	Pend-h + Brox&Pyst	22 + 3.4	0	0	97	98	95
10	Pxsf-sc + Brox&Pyst	2 + 3.4	0	0	99	99	99
11	Acet-w + Brox&Pyst	24 + 3.4	0	0	93	97	95
12	Dime + Brox&Pyst	18 + 3.4	0	0	93	99	97
13	Meto-D2M + Brox&Pyst	24 + 3.4	0	0	96	98	97
14	Mest + Brox&Pyst	1.5 + 3.4	0	19	97	99	96
	CV:		0	50	3	1	3
	LSD P=0.05		.	1	4	2	4

*Treatments **BOLDED** were applied PRE.

	Treatment	Rate	6/22 Wht	6/22 Pgwd	6/22 Colq	6/22 Vema	8/12 Yield
		----OZ AI/A, %V----	----------% Control----------				(bu/A)
1	**Saff** / Brox&Pyst	**1.1** / 3.4	0	99	99	99	75
2	**Pend-h** / Brox&Pyst	**22** / 3.4	0	99	99	99	77
3	**Pxsf-sc** / Brox&Pyst	**2** / 3.4	0	99	99	99	69
4	**Acet-w** / Brox&Pyst	**24 /** 3.4	0	99	99	99	69
5	**Dime** / Brox&Pyst	**18 /** 3.4	0	99	99	99	64
6	**Meto-D2M** / Brox&Pyst	**24 /** 3.4	0	99	99	99	67
7	**Mest** / Brox&Pyst	**1.5 /** 3.4	0	99	99	99	67
8	Brox&Pyst	3.4	0	99	99	99	63
9	Pend-h + Brox&Pyst	22 + 3.4	0	99	99	99	66
10	Pxsf-sc + Brox&Pyst	2 + 3.4	0	99	99	99	68
11	Acet-w + Brox&Pyst	24 + 3.4	0	99	99	99	66
12	Dime + Brox&Pyst	18 + 3.4	0	99	99	99	66
13	Meto-D2M + Brox&Pyst	24 + 3.4	0	99	99	99	67
14	Mest + Brox&Pyst	1.5 + 3.4	0	99	99	99	68
	CV:		0	0	0	0	14
	LSD P=0.05		.	.	.	.	14

*Wht yield was adjusted to 12% moisture.

Soil Herbicide Management of Foxtail and Waterhemp Loc. 2. Dr. Howatt and Mettler. Barley was planted near the Airport in Fargo on May 10, 2021. PRE-treatments were applied on May 10, 2021 at 10:30AM at 53°F, 30% relative humidity, 40% cloud-cover, 8 mph wind velocity at 25°, and dry soil surface at 50°F. PRE-herbicides were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. POST-treatments were applied to 3 leaf barley, and 2 to 3 leaf waterhemp. POST-treatments were applied on June 3, 2021 at 12:00PM at 93°F, 28% relative humidity, 40% cloud-cover, 7 mph wind velocity at 315°, and dry soil surface at 65°F. POST-herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/3 Bar	6/3 Wahe	6/15 Wahe	6/28 Wahe	7/12 Wahe
		----OZ AI/A, %V----	----------% Control----------				
1	**Saff** / Brox&Pyst	**1.1** / 3.4	0	52	96	92	96
2	**Pend-h** / Brox&Pyst	**22** / 3.4	0	80	96	81	91
3	**Pxsf-sc** / Brox&Pyst	**2** / 3.4	0	71	98	89	96
4	**Acet-w** / Brox&Pyst	**24 /** 3.4	0	90	99	95	98
5	**Dime** / Brox&Pyst	**18 /** 3.4	0	85	99	97	98
6	**Meto-D2M** / Brox&Pyst	**24 /** 3.4	0	85	96	88	94
7	**Mest** / Brox&Pyst	**1.5 /** 3.4	0	80	99	95	98
8	Brox&Pyst	3.4	0	0	96	83	89
9	Pend-h + Brox&Pyst	22 + 3.4	0	0	96	87	89
10	Pxsf-sc + Brox&Pyst	2 + 3.4	0	0	98	89	93
11	Acet-w + Brox&Pyst	24 + 3.4	0	0	96	98	94
12	Dime + Brox&Pyst	18 + 3.4	0	0	99	97	97
13	Meto-D2M + Brox&Pyst	24 + 3.4	0	0	98	92	97
14	Mest + Brox&Pyst	1.5 + 3.4	0	0	99	99	98
	CV:		0	7	3	5	3
	LSD P=0.05		.	4	4	6	4

*Treatments **BOLDED** were applied PRE.

Wheat Tolerance to saff and pxsf. Dr. Howatt and Mettler.

	Treatment	Rate	Timing	6/3 Wht	6/9 Wht	6/9 Pgwd	6/9 Colq	6/9 Vema	6/23 Wht	8/11 Yield
		OZ AI/A, %V		---% Injury---		------% Control------			-% Injury-	Bu/A
1	Untreated			0	0	0	0	0	0	58
2	Saff+MSO+AMS Pxsf+brox&pxsf	0.72+16+8.5 1+3.9	PRE 3L	0	0	98	93	98	0	69
3	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	PRE	0	0	99	98	99	0	64
5	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	Spike Leaf	5	5	99	93	98	0	62
6	Saff+pxsf+MSO+AMS	1.44+2+16+8.5	Spike Leaf	12	5	99	98	99	1	65
4	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	0.5 L	17	40	99	97	99	10	61
7	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	1 L	57	68	98	95	98	30	51
8	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	2 L	27	30	99	93	98	1	57
	CV:			26	24	1	4	2	43	13
	LSD P=0.05			6	7	1	5	2	3	11

*Organized by timing, not by treatment.
Pgwd: Pigweed species, Colq: Common lambsquarters, Vema: Venice mallow. Saff: Saflufenacil, pxsf: Pyroxasulfone, brox&pxsf: bromoxynil&pyroxasulfone.
*Wht yield adjusted to 12% moisture.

Wheat Tolerance to saff and pxsf (South). Dr. Howatt and Mettler.

	Treatment	Rate	Timing	6/3 Wht	6/9 Wht	6/9 Fxtl	6/9 Pgwd	6/9 Colq	6/23 Wht	8/10 Yield
		OZ AI/A, %V		---% Injury---		----------% Control---------			-% Injury-	Bu/A
1	Untreated			0	0	0	0	0	0	40
4	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	Delayed Pre	4	1	94	99	96	0	58
5	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	Spike Leaf	12	7	81	96	94	0	50
6	Saff+pxsf+MSO+AMS	1.44+2+16+8.5	Spike Leaf	15	2	90	98	95	0	60
7	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	0.5 L/Coleop	52	57	82	93	90	35	30
3	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	1 L	50	24	91	99	98	15	43
8	Saff+pxsf+MSO+AMS	0.72+1+16+8.5	3 L	0	0	0	0	0	0	62
	CV:			25	27	5	3	5	37	9
	LSD P=0.05			6	4	4	2	4	3	7

*TRT 2 was not sprayed in this trial. Organized by timing, not by treatment. Pgwd: Pigweed, Colq: Common lambsquarters, Fxtl: Foxtails. Saff: Saflufenacil, pxsf: Pyroxasulfone, brox&pxsf: bromoxynil&pyroxasulfone.
*Wht yield adjusted to 12% moisture.

Comments:

Durum Response to Pinoxaden – Cultivar Strips. Dr. Howatt, DeSimini, and Mettler. Durum wheat varieties ND Riveland, ND Grano, ND Stanley, and Joppa were planted near Fargo May 11, 2021. Treatments were applied to 2- to 3-leaf wheat on June 3, 2021 at 7:55AM at 71°F, 43% relative humidity, 10% cloud-cover, 5 mph wind velocity at 225°, and dry soil surface at 64°F. herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. An overspray of 0.5 oz of Audit and 1pt of DoubleUp was applied on June 10th to control broadleaf weeds. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/7 Durum	6/9 Durum	6/16 Durum	6/30 Durum	7/7 Durum	8/12 Yield[a]
		--OZ AI/A, %V--	----------% Injury----------					(bu/A)
1	Untreated Check		0	0	0	0	0	64
2	Flox&Pxdn	2.4	0	3	0	0	0	59
3	Flox&Pxdn + CoAct + Brox&Bcpy	2.4 + 0.91 + 3	0	1	0	0	0	58
4	Pxdn&Fenx	1.3	0	1	0	0	0	63
5	Pxdn&Fenx	2.6	0	1	0	0	0	62
6	Pxdn&Fenx + CoAct + Brox&Bcpy	1.3 + 0.91 + 3	0	2	0	0	0	58
7	Pxdn&Fenx + 2,4-D[b]	1.3 + 8	0	7	0	0	0	58
8	Pxdn&Fenx + Flox&2,4-D[c]	1.3 + 10	0	9	0	0	0	60
9	Pxdn&Fenx + 2,4-D ester + Carf	1.3 + 6 +0.128	4	9	0	0	0	57
	CV:		87	56	0	0	0	10
	LSD P=0.05		1	3	.	.	.	9

[a]Durum wheat yield was adjusted to 12% moisture.
[b]2,4-D was Rugged from Winfield Solutions.
[c]Flox&2,4-D was Trump Card from Helena.

Injury was consistent across cultivars included, so a single value was estimated across cultivars in each plot. Injury observed on June 7 was typical of carfentrazone activity. Other wheat response on June 9 manifested as a darker green color than the untreated and running check strips adjacent to each plot. This was more pronounced when looking at the plants from the side of the sun rather than when plants were between the sun and evaluator. Wheat response to pinoxaden and fenoxaprop was greatest when tankmixed with Rugged or Trump Card. These specific formulations were included because they enhanced pinoxaden injury the most among several 2,4-D formulations in previous research. Wheat response to these treatments or with 2,4-D and carfentrazone was very consistent across replicates, while response to other treatments varied by rep. Injury was not evident by June 16. Grain yield was combined across durum cultivars. Yield was not different across treatments according to Fisher's-protected LSD with α set at 0.05.

Wheat Response to Pinoxaden. Dr. Howatt, DeSimini, and Mettler. 'Linkert' wheat was planted near Fargo on May 4, 2021. Treatments were applied to 3 to 4 leaf wheat on June 3, 2021 at 8:10AM at 71°F, 43% relative humidity, 50% cloud-cover, 5 mph wind velocity at 225°, and dry soil surface at 64°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/9 Wht	6/16 Wht	7/7 Wht	8/12 Yield[a]
		--OZ AI/A, %V--	----------% Injury--------			-Bu/a-
1	Untreated Check		0	0	0	60
2	Flox&Pxdn	2.4	1	0	0	59
3	Flox&Pxdn + CoAct + Brox&Bcpy	2.4 + 0.91 + 3	1	0	0	57
4	Pxdn&Fenx	1.3	0	0	0	59
5	Pxdn&Fenx	2.6	2	0	0	55
6	Pxdn&Fenx + CoAct + Brox&Bcpy	1.3 + 0.91 + 3	1	0	0	62
7	Pxdn&Fenx + 2,4-D[b]	1.3 + 8	6	1	0	66
8	Pxdn&Fenx + Flox&2,4-D[c]	1.3 + 10	6	3	0	56
9	Pxdn&Fenx + 2,4-D ester + Carf	1.3 + 6 +0.128	4	4	0	57
	CV:		73	101	0	14
	LSD P=0.05		3	2	.	12

[a]Wheat yield was adjusted to 12% moisture.
[b]2,4-D was Rugged from Winfield Solutions.
[c]Flox&2,4-D was Trump Card from Helena.

Wheat response for most treatments on June 9 manifested as a darker green color than the untreated and running check strips adjacent to each plot. This was more pronounced when looking at the plants from the side of the sun rather than when plants were between the sun and evaluator. Carfentrazone activity elicited typical necrotic lesions. Wheat response to pinoxaden and fenoxaprop was greatest when tankmixed with Rugged or Trump Card. These specific formulations were included because they enhanced pinoxaden injury the most among several 2,4-D formulations in previous research. Wheat response to these treatments or with 2,4-D and carfentrazone was very consistent across replicates, while response to other treatments varied by rep. Injury was not evident by July 7. Yield was not different across treatments according to Fisher's-protected LSD with α set at 0.05.

Wheat Response to Tiafenacil. Dr. Howatt and Mettler. Linkert wheat was planted near Fargo on May 4, 2021. Treatments were applied PRE on May 5, 2021 at 8:10AM at 49°F, 47% relative humidity, 100% cloud-cover, 4 mph wind velocity at 315°, and dry soil surface at 46°F. Herbicides were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/3 Wht	6/9 Wht	7/15 Wht	8/11 Yield
		--OZ AI/A, %V--	----------% Injury--------			-Bu/a-
1	Untreated Check		0	0	0	52
2	Pyroxasulfone (Zidua SC)	2	0	0	0	57
3	Pxsf&Carf (Anthem Flexx)	2.25	0	0	0	55
4	Flucarbazone-P (Pre-Pare)	0.21	0	0	0	61
5	Saflufenacil (Sharpen)	0.72	0	0	0	57
6	Saflufenacil	1.4	0	0	0	58
7	Tiafenacil (Reviton)	0.35	0	0	0	58
8	Tiafenacil	0.7	0	0	0	59
	CV:		0	0	0	12
	LSD P=0.05		.	.	.	10

*Wht yield adjusted to 12% moisture.

Comments:

Wheat Response to New Pxdn. Dr. Howatt and Mettler. Linkert wheat was planted near Fargo on May 11, 2021. Treatments were applied to 3 to 4 leaf wheat on June 3, 2021 at 8:30AM at 72°F, 43% relative humidity, 50% cloud-cover, 4 mph wind velocity at 225°, and dry soil surface at 64°F. Herbicides were applied with a backpack sprayer delivering 10 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/9 Wht	6/16 Wht	7/7 Wht	8/11 Yield
		--OZ AI/A, %V--	----------% Injury--------			-Bu/a-
1	Untreated Check	0	0	0	0	67
2	Pxdn-T (Trendus)	0.86	0	0	0	67
3	Pxdn-T + Adigor	0.86 + 9.6	0	0	0	65
4	Pxdn-T + Journey	0.86 + 0.5%	0	0	0	69
5	Pxdn-T + Journey	0.86 + 9.6	0	0	0	73
6	Pxdn-T + AG14039	0.86 + 0.5%	0	0	0	76
7	Pxdn-T + AG14039	0.86 + 9.6	0	0	0	69
8	Pxdn-T + AG8050	0.86 + 0.5%	0	0	0	73
9	Pxdn-T + AG8050	0.86 + 9.6	0	0	0	73
10	Pxdn (Axial XL)	0.86	0	0	0	71
	CV:		0	0	0	11
	LSD P=0.05		.	.	.	11

*Wht yield adjusted to 12% moisture.

Comments:

Wheat Response to New Clfp. Dr. Howatt and Mettler. Linkert wheat was planted near Fargo on May 4, 2021. Treatments were applied to 3 to 4 leaf wheat on June 3, 2021 at 8:45AM at 72°F, 43% relative humidity, 43% cloud-cover, 3 mph wind velocity at 225°, and dry soil surface at 64°F. Herbicides were applied with a backpack sprayer delivering 10 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/9 Wht	6/16 Wht	7/7 Wht	8/11 Yield
		--OZ AI/A, %V--	----------% Injury--------			-Bu/a-
1	Untreated Check		0	0	0	77
2	Clfp-S (Slam′R)	0.8	0	0	0	70
3	Clfp-S + PO	0.8 + 11	0	0	0	78
4	Clfp-S + Journey	0.8 + 0.5%	0	0	0	72
5	Clfp-S+ Journey	0.8 + 11	0	0	0	81
6	Clfp-S + AG8050	0.8 + 0.5%	0	0	0	77
7	Clfp-S + AG8050	0.8 + 11	0	0	0	73
8	Clfp-S + AG14039	0.8 + 0.5%	0	0	0	80
9	Clfp-S + AG14039	0.8 + 11	0	0	0	76
10	Clfp NG (Discover NG)	0.8	0	0	0	74
	CV:		0	0	0	11
	LSD P=0.05		.	.	.	12

*Wht yield adjusted to 12% moisture.

Comments:

Wheat Desiccation. Dr. Howatt and Mettler. Durum wheat (Mix of Grano and Alkabo cultivars) was planted near Fargo on May 11 2021. Treatments were applied to milky solids to firm dough wheat on August 5, 2021 at 8:30AM at 75°F, 70% relative humidity, 10% haze, 3 mph wind velocity at 280°, and dry soil surface at 79°F. All treatments except 7, 8 and 9 were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. Treatment 7 was applied at 17 gpa at 40 psi through TTI 11002 nozzles. Treatments 8 and 9 were applied at 8.5 gpa at 40 psi through TT 11001 nozzles. The experiment was a randomized complete block design with four replicates.

	Treatment	GPA	Rate	8/9	8/12	8/12	8/12	8/11
				----------Wheat----------				Moisture
			--OZ AI/A, %V--	--% Desiccation--		FW (g)	DW (g)	----%----
1	Untreated Check			83	95	526	436	17
2	NaClO3 + Surf-Ac 910	17 GPA	96 + 0.125%	95	99	522	441	15
3	NaClO3	17 GPA	48	84	99	530	413	22
4	NaClO3 + Surf-Ac 910	17 GPA	48 + 0.125%	92	99	541	469	14
5	NaClO3 + Hot MES	17 GPA	48 + 16	89	99	586	473	20
6	NaClO3 + Hot MES + UAN	17 GPA	48 + 16 +2.5%	89	99	571	483	15
7	NaClO3 + Hot MES	17 GPA * USE TTI	48 + 16	85	99	596	451	22
8	**NaClO3 + Hot MES**	**8.5 GPA**	48 + 16	93	99	486	416	15
9	**Glyt – 4.5 + AMS**	**8.5 GPA**	12 + 22	96	99	536	483	10
	CV:			3	0.3	1	15	40
	LSD P=0.05			4	1	0.5	96	10

FW: Fresh weight, DW: Dry weight

Comments:

Broadleaf Control in Wheat. Dr. Howatt Mettler, and DeSimini. Linkert wheat was planted near Fargo, ND on May 7, 2021. Treatments were applied to 2 to 3-inch redroot pigweed, 2-inch common lambsquarters, 2-inch wild mustard, 2 to 3-inch wild buckwheat, 1-inch venice mallow, and 3 to 4 leaf wheat. Treatments were applied on June 10, 2021 at 10:30AM at 93°F, 45% relative humidity, 0% cloud-cover, 4 mph wind velocity at 45°, and dry soil surface at 71°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/25 Wht	6/25 Rrpw	6/25 Colq	6/25 Wimu	6/25 Wibw
		----OZ AI/A, %V----	% Injury	----------% Control----------			
1	Fenx (Tacoma) + 2,4-De (Salvo)	0.8 + 8	0	87	89	89	74
2	Fenx + 2,4-DP	0.8 + 8	0	92	84	91	84
3	Fenx + clpy&flox (Wide Match)	0.8 +3	0	80	84	85	79
4	Fenx + clpy&flox&haux	0.8 + 3.36	0	95	89	95	86
5	Fenx + clpy&flox&MCPA	0.8 + 8	0	94	91	94	82
6	Fenx + haux + MSO	0.8 + 0.07 + 16	0	85	91	89	79
7	Fenx + haux&flas + NIS	0.8 + 0.15 + 0.25%	0	84	76	87	75
8	Fenx + haux&flox (Pixxaro)	0.8 + 1.8	0	79	86	81	70
9	Fenx + carf + 2,4-De	0.8 +0.128 + 6	0	91	94	91	81
10	Fenx+thif-sg+trib-sg+2,4-De+NIS	0.8+0.24+0.06+4+0.25%	0	95	94	95	92
11	Fenx+thif-sg+trib-sg+2,4-De+NIS	0.8+0.15+0.15+4+0.25%	0	95	95	95	94
12	Fenx + brox&MCPA (Bison)	0.8 + 8	0	89	94	92	75
13	Fenx + brox&pyst (Huskie)	0.8 + 3.4	0	95	95	95	91
14	Fenx + brox&flox&pyst (Huskie FX)	0.8 + 4.5	0	95	94	95	90
15	Fenx+CoAct+brox&bcpy+COC	0.8 + 0.91 + 3 +1%	0	94	95	94	89
16	Fenx + brox&flox&2,4-D	0.8 + 10	0	90	95	91	89
	CV:		0	3	1	2	1
	LSD P=0.05		.	5	4	4	6

	Treatment	6/25 Vema	7/8 Rrpw	7/8 Colq	7/8 Wimu	7/8 Wibw	7/8 Vema
		----------% Control----------					
1	Fenx (Tacoma) + 2,4-De (Salvo)	80	93	95	99	91	79
2	Fenx + 2,4-DP	75	91	94	99	79	70
3	Fenx + clpy&flox (Wide Match)	74	84	84	99	95	88
4	Fenx + clpy&flox&haux	85	97	98	99	99	96
5	Fenx + clpy&flox&MCPA	79	97	98	99	98	95
6	Fenx + haux + MSO	81	99	99	99	75	87
7	Fenx + haux&flas + NIS	74	91	92	99	92	92
8	Fenx + haux&flox (Pixxaro)	70	99	99	98	82	94
9	Fenx + carf + 2,4-De	79	99	99	99	75	89
10	Fenx+thif-sg+trib-sg+2,4-De+NIS	85	98	98	99	97	92
11	Fenx+thif-sg+trib-sg+2,4-De+NIS	87	96	98	99	99	95
12	Fenx + brox&MCPA (Bison)	71	99	98	99	92	89
13	Fenx + brox&pyst (Huskie)	86	99	99	99	99	96
14	Fenx + brox&flox&pyst (Huskie FX)	87	99	92	99	99	91
15	Fenx+CoAct+brox&bcpy+COC	86	99	97	99	79	97
16	Fenx + brox&flox&2,4-D	85	99	99	99	99	98
	CV:	5	2	2	1	5	4
	LSD P=0.05	6	3	3	1	7	5

Broadleaf Control in Wheat. Dr. Howatt Mettler, and DeSimini. This trial was established in a non-cropped area. Treatments were applied to 2 to 3-inch common lambsquarters, and 2 to 3-inch waterhemp. Treatments were applied on June 14, 2021 at 10:50AM at 78°F, 43% relative humidity, 0% cloud-cover, 3 mph wind velocity at 315°, and dry soil surface at 71°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

			6/30	6/30	7/12	7/12
	Treatment	**Rate**	**Wahe**	**Colq**	**Wahe**	**Colq**
		----OZ AI/A, %V----	----------% Control----------			
1	Fenx (Tacoma) + 2,4-De (Salvo)	0.8 + 8	85	90	87	97
2	Fenx + 2,4-DP	0.8 + 8	71	77	64	85
3	Fenx + clpy&flox (Wide Match)	0.8 +3	45	32	30	32
4	Fenx + clpy&flox&haux	0.8 + 3.36	80	89	82	91
5	Fenx + clpy&flox&MCPA	0.8 + 8	79	87	75	95
6	Fenx + haux + MSO	0.8 + 0.07 + 16	79	89	81	88
7	Fenx + haux&flas + NIS	0.8 + 0.15 + 0.25%	75	71	80	81
8	Fenx + haux&flox (Pixxaro)	0.8 + 1.8	75	88	81	87
9	Fenx + carf + 2,4-De	0.8 +0.128 + 6	91	92	83	98
10	Fenx+thif-sg+trib-sg+2,4-De+NIS	0.8+0.24+0.06+4+0.25%	82	92	83	98
11	Fenx+thif-sg+trib-sg+2,4-De+NIS	0.8+0.15+0.15+4+0.25%	81	93	81	98
12	Fenx + brox&MCPA (Bison)	0.8 + 8	64	88	65	92
13	Fenx + brox&pyst (Huskie)	0.8 + 3.4	92	95	91	93
14	Fenx + brox&flox&pyst (Huskie FX)	0.8 + 4.5	94	96	94	98
15	Fenx+CoAct+brox&bcpy+COC	0.8 + 0.91 + 3 +1%	90	95	87	92
16	Fenx + brox&flox&2,4-D	0.8 + 10	81	94	74	95
	CV:		5	4	6	3
	LSD P=0.05		6	5	6	4

Waterhemp Control in Wheat/Barley. Dr. Howatt Mettler, and DeSimini. This trial was established in a non-cropped area. Treatments were applied to 2 to 3-inch common lambsquarters, and 2 to 3-inch waterhemp. Treatments were applied on June 14, 2021 at 10:20AM at 77°F, 43% relative humidity, 0% cloud-cover, 2 mph wind velocity at 315°, and dry soil surface at 67°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/30 Wahe	6/30 Colq	7/12 Wahe	7/12 Colq
		----OZ AI/A, %V----	----------% Control----------			
1	Carf + 2,4-D ester	0.128 + 8	89	92	90	94
2	Carf + 2,4-D ester	0.256 + 8	87	96	85	98
3	Carf + 2,4-D ester	0.128 + 12	92	95	92	97
4	Carf + 2,4-Dp (Dccp)	0.128 + 8	84	87	80	93
5	Carf + Haux&Flox (Pixxaro EC)	0.128 + 1.8	81	86	82	88
6	Brox&Bycp (Talinor) + CoAct + COC	3 + 0.91 + 1%	86	94	88	96
7	Brox&Pyst (Huskie)	3.4	94	96	91	99
8	Brox&Pyst	3.9	96	97	97	99
9	Brox&Flox&Pyst (Huskie FX)	4.5	95	97	93	97
10	Brox&Pyst + 2,4-D ester	3.4 + 6	96	96	98	99
11	Brox&Pyst + 2,4-Dp (Dccp)	3.4 + 6	92	97	97	99
12	Brox&Pyst + MCPA ester	3.4 + 6	95	97	97	98
13	Brox&Pyst + Dica-c	3.4 + 1	92	96	97	98
14	Brox&Pyst + Haux&Flox	3.4 + 1.8	94	97	94	98
15	Brox&Pyst + Carf	3.4 + 0.128	91	96	98	99
	CV:		3	2	3	2
	LSD P=0.05		5	2	4	3

Comments:

Waterhemp Control in Wheat/Barley Location 2. Dr. Howatt, Mettler, and DeSimini. Barley was planted on May 10, 2021 near the airport in Fargo, ND. Treatments were applied to 2 to 4-inch waterhemp. Treatments were applied on June 14, 2021 at 8:10AM at 67°F, 55% relative humidity, 0% cloud-cover, 2 mph wind velocity at 315°, and dry soil surface at 64°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/28 Wahe	7/12 Wahe
		----OZ AI/A, %V----	------% Control-------	
1	Carf + 2,4-D ester	0.128 + 8	91	98
2	Carf + 2,4-D ester	0.256 + 8	96	98
3	Carf + 2,4-D ester	0.128 + 12	96	99
4	Carf + 2,4-Dp (Dccp)	0.128 + 8	92	92
5	Carf + Haux&Flox (Pixxaro EC)	0.128 + 1.8	89	92
6	Brox&Bycp (Talinor) + CoAct + COC	3 + 0.91 + 1%	98	99
7	Brox&Pyst (Huskie)	3.4	97	99
8	Brox&Pyst	3.9	95	98
9	Brox&Flox&Pyst (Huskie FX)	4.5	98	99
10	Brox&Pyst + 2,4-D ester	3.4 + 6	97	98
11	Brox&Pyst + 2,4-Dp (Dccp)	3.4 + 6	97	97
12	Brox&Pyst + MCPA ester	3.4 + 6	97	93
13	Brox&Pyst + Dica-c	3.4 + 1	96	99
14	Brox&Pyst + Haux&Flox	3.4 + 1.8	95	98
15	Brox&Pyst + Carf	3.4 + 0.128	98	98
	CV:		2	2
	LSD P=0.05		3	3

Kochia Control with Huskie FX. Dr. Howatt, Mettler, and DeSimini. Murdock wheat was planted near Baldhill Dam on April 7,2021. Treatments were applied to 4 to 5 leaf wheat on June 2 at 8:00AM at 66°F, 65% relative humidity, 30% cloud-cover, 3 mph wind velocity at 135°, and damp soil surface at 59°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

			6/9	6/16	6/9	6/16	7/13
	Treatment	**Rate**	**----Wheat----**		**Kochia**	**Kochia**	**Kochia**
		--OZ AI/A, %V--	--% Injury--		----------% Control----------		
1:	Untreated Check		0	0	0	0	0
2:	Brox&Flox&Pyst (Huskie FX)	4.47	0	0	72	91	94
3:	Brox&Flox&Pyst	5.19	0	0	76	95	98
4:	Clpy&Flox (Widematch) + MCPA ester	3 + 4	0	0	55	80	91
5:	Brox&Bcpy (Talinor) + CoAct + COC	0.91 + 3 + 1%	6	0	84	97	99
6:	Brox&MCPA (Bison)	8	0	0	74	85	94
	CV:		64	0	8	4	2
	LSD P=0.05		1	.	7	5	2

Kochia Control Herbicides in Wheat. Dr. Howatt, Mettler, and DeSimini. Murdock wheat was planted on April 7, 2021 near Valley City, ND. Treatments were applied to 4 to 5-leaf wheat and 2 to 5-inch kochia on June 2, 2021 at 8:15AM at 69°F, 58% relative humidity, 10% cloud-cover, 4 mph wind velocity at 270°, and damp soil surface at 59°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

			6/9	6/16	7/13
	Treatment	**Rate**	**Wheat**	**Kochia**	**Kochia**
		----OZ AI/A, %V----	-% Injury-	-----% Control-----	
1	Flox	2	0	77	87
2	2,4-DP (Dcpp)	8	9	83	94
3	2,4-DP	16	13	87	97
4	Brox&Flox (Starane NXT)	7.5	0	94	99
5	Brox&Flox&2,4-D (Kochiavore)	10	4	93	97
6	Brox&2,4-D (Double Up)	10	2	96	97
7	Bromoxynil-2 (Maestro) + 2,4-DP	3.5 + 7	8	96	98
8	Carf + 2,4-DP + NIS	0.128 + 8 + 0.25%	13	82	89
9	Broxl&Pyst	3.4	3	91	87
10	Brox&Flox&Pyst (Huskie FX)	4.4	0	96	99
11	Brox&Flox&Pyst	5.2	1	94	99
12	Brox&Bcpy (Talinor) + CoAct + COC	3 + 0.91 + 1%	2	97	96
13	Brox&Bcpy + 2,4-DP + CoAct	3 + 8 + 0.91	3	98	99
14	Haux&Flox (Pixxaro EC)	1.8	0	78	87
15	Clpy&Flox&Haux (WideARMatch)	3.36	0	78	88
	CV:		52	4	3
	LSD P=0.05		3	6	5

Comments:

Kochia Control with EC Formulations Dr. Howatt and Mettler. Murdock wheat was planted North of Baldhill Dam on April 7, 2021. Treatments were applied to 2 to 5-inch kochia and 4 to 5-leaf wheat on June 2, 2021 at 8:45AM at 70°F, 58% relative humidity, 10% cloud-cover, 4 mph wind velocity at 270°, and damp soil surface at 59°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with three replicates.

			6/9	6/9	6/16	7/13
	Treatment	**Rate**	**Wheat**	**Kochia**	**Kochia**	**Kochia**
		----OZ AI/A, %V----	----------% Control----------			
1	Untreated		0	0	0	0
2	N-203	9.6	4	85	96	98
3	N-203 + NIS	9.6 + 0.5%	3	83	94	99
4	N-203	12	3	77	91	96
5	N-203	24	5	94	97	97
6	2,4-DP + Brox-2	8 + 8	3	89	97	98
7	2,4-DP	8	3	87	78	93
8	Brox-2	8	1	93	97	98
9	N-006 + NIS	0.07 + 0.5%	0	53	40	20
10	N-203 + N-006 + NIS	12 + 0.07 + 0.5%	2	85	91	98
11	N-203 + N-006 + NIS	9.6 + 0.058 + 0.5%	2	85	94	98
12	N-105 + NIS + UAN	0.44 + 0.25% + 32	7	57	57	43
13	N-106 + NIS + UAN	0.44 + 0.25% + 32	6	57	47	27
14	N-004 + NIS + UAN	0.44 + 0.25% + 32	6	53	40	53
15	N-203 + N-105 + NIS + UAN	12 + 0.44 + 0.25% + 32	4	92	97	99
16	N-203 + N-106 + NIS + UAN	12 + 0.44 + 0.25% + 32	7	88	98	99
17	N-203 + N-004 + NIS + UAN	12 + 0.44 + 0.25% + 32	4	88	93	99
	CV:		71	6	5	5
	LSD P=0.05		4	8	6	6

Broadleaf Control with EC Formulations Dr. Howatt and Mettler. Linkert wheat was planted in Fargo on May 7, 2021. Treatments were applied to 1 to 2-inch wild mustard, 2 to 3-inch wild buckwheat, 1 to 2-inch redroot pigweed, 1 to 2-inch common lambsquarters and 4 to 5-leaf wheat on June 10, 2021 at 8:20AM at 74°F, 74% relative humidity, 0% cloud-cover, 8 mph wind velocity at 45°, and dry soil surface at 71°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/16 Wheat	6/16 Rrpw	6/16 Colq	6/16 Wimu	6/16 Wibw	6/23 Rrpw	6/23 Colq
		----OZ AI/A, %V----	----------% Control----------						
1	Untreated		0	0	0	0	0	0	0
2	N-203	9.6	0	79	85	84	89	89	98
3	N-203 + NIS	9.6 + 0.5%	0	84	91	92	92	95	98
4	N-203	12	0	81	87	94	94	92	98
5	N-203	24	0	94	91	93	94	98	99
6	2,4-DP + Brox-2	8 + 8	0	86	92	91	89	96	99
7	2,4-DP	8	0	32	35	47	37	86	81
8	Brox-2	8	0	92	95	94	94	98	99
9	N-006 + NIS	0.07 + 0.5%	0	52	37	75	42	84	42
10	N-203 + N-006 + NIS	12 + 0.07 + 0.5%	0	94	95	96	96	92	95
11	N-203 + N-006 + NIS	9.6 + 0.058 + 0.5%	0	85	91	93	94	98	99
12	N-105 + NIS + UAN	0.44 + 0.25% + 32	0	65	42	71	60	89	57
13	N-106 + NIS + UAN	0.44 + 0.25% + 32	0	37	25	30	25	80	32
14	N-004 + NIS + UAN	0.44 + 0.25% + 32	0	65	42	76	62	90	62
15	N-203 + N-105 + NIS + UAN	12 + 0.44 + 0.25% + 32	0	92	95	92	94	95	96
16	N-203 + N-106 + NIS + UAN	12 + 0.44 + 0.25% + 32	0	89	85	94	91	98	98
17	N-203 + N-004 + NIS + UAN	12 + 0.44 + 0.25% + 32	0	91	94	94	94	94	96
	CV:		0	6	7	5	4	4	6
	LSD P=0.05		.	6	7	5	5	4	7

	Treatment	Rate	6/23 Wimu	6/23 Wibw	7/7 Rrpw	7/7 Colq	7/7 Wimu	7/7 Wibw
		----OZ AI/A, %V----	----------% Control----------					
1	Untreated		0	0	0	0	0	0
2	N-203	9.6	98	94	83	98	98	94
3	N-203 + NIS	9.6 + 0.5%	99	97	86	98	99	88
4	N-203	12	98	96	88	97	97	89
5	N-203	24	98	98	97	99	99	98
6	2,4-DP + Brox-2	8 + 8	99	99	92	99	99	99
7	2,4-DP	8	92	80	82	86	92	65
8	Brox-2	8	99	99	93	99	99	98
9	N-006 + NIS	0.07 + 0.5%	90	71	76	37	96	90
10	N-203 + N-006 + NIS	12 + 0.07 + 0.5%	97	96	94	98	99	98
11	N-203 + N-006 + NIS	9.6 + 0.058 + 0.5%	99	99	96	99	99	99
12	N-105 + NIS + UAN	0.44 + 0.25% + 32	94	86	95	62	97	94
13	N-106 + NIS + UAN	0.44 + 0.25% + 32	71	62	94	32	90	47
14	N-004 + NIS + UAN	0.44 + 0.25% + 32	94	75	96	80	95	94
15	N-203 + N-105 + NIS + UAN	12 + 0.44 + 0.25% + 32	97	96	98	98	98	97
16	N-203 + N-106 + NIS + UAN	12 + 0.44 + 0.25% + 32	99	98	99	99	99	98
17	N-203 + N-004 + NIS + UAN	12 + 0.44 + 0.25% + 32	94	94	95	97	98	96
	CV:		6	5	3	4	1	4
	LSD P=0.05		8	6	4	5	2	5

Rrpw: Redroot pigweed, Colq: Common lambsquarters, Wimu: Wild mustard, Wibw: Wild buckwheat.

Weed Control with Haux Premixes. Dr. Howatt, Mettler, and DeSimini. Linkert wheat was planted on May 7, 2021 near Fargo, ND. Treatments were applied to 4 to 5-leaf wheat, 1-inch venice mallow, 1 to 2-inch common lambsquarters, 1-inch redroot pigweed and 1-inch annual smartweed/wild buckwheat on June 10, 2021 at 8:05AM at 74°F, 73% relative humidity, 0% cloud-cover, 7 mph wind velocity at 45°, and dry soil surface at 71°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/14	6/16	6/23	7/7	7/12	7/26	8/5	8/10
			Wheat							
		-OZ AI/A, %V-	% Injury				Head Delay	Senescence	Lodge	
1	Untreated Check	0	0	0	0	0	0	50	0	0
2	Haux&Flox (Pixxaro EC) + NIS	1.83 + 0.25%	0	0	0	0	0	50	0	0
3	Haux&Flox + 2,4-D ester (Salvo)	1.83 + 5.5	0	0	0	0	0	50	0	0
4	Haux&Flox + Thif-sg + Trib-sg + NIS	1.83+0.23+0.08+0.25%	0	0	0	0	0	50	0	0
5	Pxlm&Flox (OpenSky) + NIS + AMS-L	2.1 + 0.5% + 60 fl oz	9	8	0	0	0	50	0	0
6	Flox&Haux&Pxdn (Rezuvant)	2.7	0	0	0	0	0	50	0	0
7	Flox&Haux&Pxdn + Thif-sg + Trib-sg	2.7 +0.23+0.08	0	0	0	0	0	50	0	0
8	Flox&Haux&Pxdn+Thif-sg+Trib-sg+ MCPAe	2.7+0.23+0.08+5.7	0	0	0	0	0	50	0	0
9	Clpy&Flox&Haux (WideARMatch)	3.36	0	0	0	0	0	50	0	0
10	Haux&Flox + Carf (Aim EC) + NIS	1.83+0.128+0.25%	0	0	0	0	0	50	0	0
11	Brox&Flox&Pyst (Huskie FX)	4.5	0	0	0	0	0	50	0	0
	CV:		35	88	0	0	0	0	0	0
	LSD P=0.05		0.4	1	.	.	.	.	.	.

	Treatment	6/16 Rrpw	6/16 Colq	6/16 Answ	6/16 Vema	6/23 Rrpw	6/23 Colq	6/23 Answ/wibw
		----------% Control----------						
1	Untreated Check	0	0	0	0	0	0	0
2	Haux&Flox (Pixxaro EC) + NIS	85	79	74	71	92	91	94
3	Haux&Flox + 2,4-D ester (Salvo)	87	79	76	79	96	91	96
4	Haux&Flox + Thif-sg + Trib-sg + NIS	87	82	82	84	97	96	93
5	Pxlm&Flox (OpenSky) + NIS + AMS-L	86	74	76	76	96	92	92
6	Flox&Haux&Pxdn (Rezuvant)	74	72	69	71	82	84	75
7	Flox&Haux&Pxdn + Thif-sg + Trib-sg	86	81	81	76	97	91	96
8	Flox&Haux&Pxdn+Thif-sg+Trib-sg+ MCPAe	84	79	80	77	97	97	95
9	Clpy&Flox&Haux (WideARMatch)	74	74	72	72	90	92	92
10	Haux&Flox + Carf (Aim EC) + NIS	89	85	81	77	96	91	92
11	Brox&Flox&Pyst (Huskie FX)	94	91	91	95	99	99	96
	CV:	4	5	6	5	3	3	3
	LSD P=0.05	5	5	6	5	4	4	4

	Treatment	6/23 Vema	7/7 Rrpw	7/7 Colq	7/7 Answ/Wibw	7/7 Vema
		----------% Control----------				
1	Untreated Check	0	0	0	0	0
2	Haux&Flox (Pixxaro EC) + NIS	94	93	95	93	95
3	Haux&Flox + 2,4-D ester (Salvo)	95	98	99	96	97
4	Haux&Flox + Thif-sg + Trib-sg + NIS	97	99	99	95	98
5	Pxlm&Flox (OpenSky) + NIS + AMS-L	93	97	95	96	96
6	Flox&Haux&Pxdn (Rezuvant)	86	87	87	84	93
7	Flox&Haux&Pxdn + Thif-sg + Trib-sg	95	99	96	97	98
8	Flox&Haux&Pxdn+Thif-sg+Trib-sg+ MCPAe	93	97	98	98	99
9	Clpy&Flox&Haux (WideARMatch)	92	93	96	97	98
10	Haux&Flox + Carf (Aim EC) + NIS	93	99	99	95	97
11	Brox&Flox&Pyst (Huskie FX)	99	99	99	98	99
	CV:	3	2	2	2	1
	LSD P=0.05	4	2	2	3	2

Foxtail Control in Wheat. Dr. Howatt Mettler, and DeSimini. Linkert wheat was planted near Fargo, ND on May 7, 2021. Treatments were applied to 1 to 2 leaf yellow foxtail and 2 to 4 leaf wheat. Treatments were applied on June 10, 2021 at 9:50AM at 83°F, 62% relative humidity, 0% cloud-cover, 7 mph wind velocity at 45°, and dry soil surface at 71°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/25 Wht	6/25 Yeft	7/8 Yeft
		----OZ AI/A, %V----	-% Injury-	---------% Control-------	
1	Brox&MCPA	8	0	0	0
2	Flcz + Brox&MCPA + BB	0.44+ 8 +1%	0	85	87
3	Pxlm + Brox&MCPA + BB	0.21+ 8 + 1%	0	84	84
4	Pxlm&Flox + Thif-sg + BB	2.1 + 0.25 + 1%	0	82	85
5	Thcz + Brox&MCPA + BB	0.072 + 8 +1%	0	89	86
6	Thcz + Trib-sg + 2,4-D ester	0.072 + 0.11 + 4	0	85	86
7	Brox&Pyst&Thcz + UAN	3+16	0	85	91
8	Fenx + Brox&MCPA	0.8 + 8	0	71	45
9	Fenx&Brox&Pyst		0	85	81
10	Pxdn + Brox&MCPA	0.86 + 8	0	86	85
11	Pxdn&Fenx + Brox&MCPA	1.28 + 8	0	91	85
	CV:		0	4	5
	LSD P=0.05		.	5	5

Foxtail and Thistle Control with Thcz + Trib. Dr. Howatt Mettler, and DeSimini. Linkert wheat was planted near Fargo, ND on April 28, 2021. Treatments were applied to 3 to 6 inch Canada thistle, 2 to 4 inch wild buckwheat, spike to 1 leaf wild oat and 1 to 3 leaf wheat. Treatments were applied on May 27, 2021 at 9:10AM at 47°F, 60% relative humidity, 100% cloud-cover, 7 mph wind velocity at 360°, and dry soil surface at 59°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

			6/4	6/16	7/15	6/4	6/4
	Treatment	**Rate**		**Wht**		**Cath**	**Wioa**
		--OZ AI/A, %V--	----------% Injury----------			% Control	
1	Untreated Check		0	0	0	0	0
2	Thcz (Luxxur B) + Trib-sg (Luxxur A)	0.072 + 0.11	0	0	0	47	80
3	Thcz + Trib-sg + Flox&Flas (Starane Flex)	0.072 + 0.11 + 1.47	0	0	0	50	70
4	Thcz + Trib-sg + 2,4-D ester	0.072 + 0.11 + 4	0	0	0	45	79
5	Thcz + Trib-sg + Flox&Flas + 2,4-D ester	0.072 + 0.11 + 1.47 + 4	0	0	0	40	76
6	Thcz + Trib-sg + Thif&Flox (Sentrallas)	0.072 + 0.11 + 1.94	0	0	0	50	74
7	Thcz + Trib-sg Thif&Flox + 2,4-D ester	0.072 + 0.11 + 1.94 + 4	11	10	8	37	79
8	Thcz + Trib-sg + Brox&MCPA (Bromac 4EC)	0.072 + 0.11 + 8	4	0	0	60	95
9	Brox&Pyst&Thcz (Huskie Complete)	3	5	0	0	65	95
	CV:		130	97	80	15	12
	LSD P=0.05		4	2	1	7	5

	Treatment	6/4 Wibw	6/16 Cath	6/16 Wioa	6/16 Wibw	7/15 Cath	7/15 Wioa	7/15 Wibw
		----------% Control----------						
1	Untreated Check	0	0	0	0	0	0	0
2	Thcz (Luxxur B) + Trib-sg (Luxxur A)	80	75	95	86	74	92	82
3	Thcz + Trib-sg + Flox&Flas (Starane Flex)	70	80	95	93	82	89	86
4	Thcz + Trib-sg + 2,4-D ester	79	80	95	95	80	88	84
5	Thcz + Trib-sg + Flox&Flas + 2,4-D ester	76	79	94	96	79	85	83
6	Thcz + Trib-sg + Thif&Flox (Sentrallas)	74	67	95	95	79	93	88
7	Thcz + Trib-sg Thif&Flox + 2,4-D ester	79	74	95	90	76	87	80
8	Thcz + Trib-sg + Brox&MCPA (Bromac 4EC)	95	52	94	87	65	89	84
9	Brox&Pyst&Thcz (Huskie Complete)	95	52	92	92	65	82	81
	CV:	5	10	3	4	7	3	4
	LSD P=0.05	5	9	3	5	7	4	5

Comments:

Foxtail Control with Pxsf. Dr. Howatt Mettler, and DeSimini. Linkert wheat was planted near Fargo, ND on May 7, 2021. The first treatment was applied delayed PRE-with 3-5% emerged on May 18, 2021 at 7:10AM at 63°F, 63% relative humidity, 0% cloud-cover, 7 mph wind velocity at 180°, and dry soil surface at 60°F. Herbicides were applied with a backpack sprayer delivering 17 gpa at 40 psi through 11002 TT nozzles. POST application treatments were applied to 1 to 2-inch wild mustard, 1 to 2-inch common lambsquarters, 1 to 2-inch pigweeds, 1 to 2 leaf yellow foxtail, and 3 to 4 leaf wheat. Treatments were applied on June 10, 2021 at 7:45AM at 74°F, 75% relative humidity, 0% cloud-cover, 7 mph wind velocity at 45°, and dry soil surface at 63°F. Herbicides were applied with a backpack sprayer delivering 8.5 gpa at 40 psi through 11001 TT nozzles to a 7-foot-wide area the length of 10 by 30-foot plots. The experiment was a randomized complete block design with four replicates.

	Treatment	Rate	6/3 Wht	6/22 Wht	6/22 Yeft	6/22 Pgwd	6/22 Colq
		--OZ AI/A, %V--	---------% Injury---------		----------% Control----------		
1	Untreated Check		0	0	49	47	15
2	**Pxsf&Carf (Anthem Flexx)**	**1.5**	0	0	98	91	32
3	**Pxsf&Carf**	**1.75**	0	0	73	72	22
4	**Pxsf&Carf**	**2**	0	0	73	72	27
5	**Pxsf&Carf** + Brox&Pyst&Thcz + UAN	1.75 + 3 + 16	0	0	94	99	98
6	**Pxsf&Carf** + Pxlm&Flas&Flox (Goldsky)	1.75 + 1.67	0	0	95	94	85
7	**Pxsf&Carf** + Fenx&Brox&Pyst (Wolverine Adv)	1.75 + 5.4	0	0	96	98	98
8	Brox&Pyst&Thcz (Huskie Complete) + UAN	3 + 16	0	0	91	96	95
9	Pxlm&Flas&Flox	1.67	0	0	89	91	80
10	Fenx&Brox&Pyst	5.4	0	0	94	95	96
	CV:		0	0	35	34	16
	LSD P=0.05		.	.	43	42	15

*Bolded treatments applied delayed PRE

	Treatment	Rate	6/22 Wimu	7/7 Yeft	7/7 Pgwd	7/7 Colq	7/7 Wimu
		--OZ AI/A, %V--	----------% Control----------				
1	Untreated Check		32	49	47	17	34
2	**Pxsf&Carf (Anthem Flexx)**	**1.5**	42	98	87	32	42
3	**Pxsf&Carf**	**1.75**	40	73	72	22	40
4	**Pxsf&Carf**	**2**	56	73	73	30	56
5	**Pxsf&Carf** + Brox&Pyst&Thcz + UAN	1.75 + 3 + 16	98	99	99	97	99
6	**Pxsf&Carf** + Pxlm&Flas&Flox (Goldsky)	1.75 + 1.67	95	99	99	97	99
7	**Pxsf&Carf** + Fenx&Brox&Pyst (Wolverine Adv)	1.75 + 5.4	99	99	99	97	99
8	Brox&Pyst&Thcz (Huskie Complete) + UAN	3 + 16	97	99	98	98	99
9	Pxlm&Flas&Flox	1.67	89	99	98	97	99
10	Fenx&Brox&Pyst	5.4	97	99	98	97	99
	CV:		27	34	34	16	27
	LSD P=0.05		29	43	43	16	30

Comments: