2021 Winter Advisory Board Meeting

Weed Science Research Update
Caleb Dalley and Daniel Abe
February 16, 2021

Research Project Results for 2020:

1) Dicamba and 2,4-D carryover following fall application.
    a. Dicamba applied at 4 and 8 oz/A
    b. 2,4-D (LV-6) applied at 11 and 22 oz/A
    c. Trials conducted in Hettinger and Minot (Brian Jenks)
    d. Single application timing:
        i. November 19, 2019 in Hettinger
        ii. October 8, 2019 in Minot
    e. Field pea, lentils, chickpeas, and sunflowers were planted in spring to determine if herbicide carryover would cause injury.
    f. Moderate injury to lentil from dicamba application at both locations
        i. Visual injury lessened over time and no reduction in stand or height.
        ii. No reduction in yield at either location.
    g. No injury, stand, or yield reduction for field pea, chickpea, or sunflower
    h. Subset of trial is being repeated in 2021.
        i. Only one application timing (November 8)
        ii. Will collect yield data
    i. From this data we will work with the companies that sell 2,4-D and dicamba to try to get the language changed on the label.
2) Weed control in spring wheat with Huskie FX
    a. Huskie FX is a new premix from Bayer Crop Sciences that will be available starting in 2021.
    b. Combination of Huskie (bromoxynil plus pyrasulfotole) and Starane (fluroxypyr)
    c. Fluroxypyr added to improve control of kochia

Table. Weed control with Huskie FX compared with standard treatments.

	Rate	Kochia				Common lambsquarters				Wild buckwheat				Wheat
Treatment	oz/A	6dat	13dat	20dat	27dat	6dat	13dat	20dat	27dat	6dat	13dat	20dat	27dat	yield
		% control												–BU/A–
1 Untreated		0	0	0	0	0	0	0	0	0	0	0	0	26
2 Huskie FX	15.5	85	88	94	97	86	95	93	93	73	91	97	100	24
3 Huskie FX	18	85	94	98	97	87	96	100	100	76	100	100	100	25
4 Widematch	16	79	79	80	87	82	81	88	100	75	81	79	89	26
MCPA Ester	8													
5 Talinor	13.7	79	83	83	80	85	91	93	96	76	91	90	81	26
CoAct+	2.75													
6 Bison	16	82	86	87	84	88	92	97	99	78	88	91	86	28
7 Luxxur B	6.85	82	93	94	96	86	96	93	95	75	97	100	99	24
Luxxur A	0.21													
Huskie FX	15.5													
8 Axial Bold	15	86	92	95	94	91	99	99	98	84	98	100	98	26
Huskie FX	15.5													
LSD (p = 0.10)		2.5	5.8	6.2	6.6	3.9	5.0	5.6	4.6	5.6	8.0	6.7	5.9	NS

3) Evaluation of tolerance of tame buckwheat and tame mustard to pre- and post-emergence herbicides.
    a. Few herbicides registered for use in tame buckwheat and mustard
    b. Poast (sethoxydim) is only postemergence grass herbicide registered for use in buckwheat
    c. Trials conducted in Hettinger, Hillsboro, and Fargo to assess tolerance.
    d. Low rainfall at Hettinger resulted in little or no injury from preemergence herbicides
        i. Rainfall in May and June: Hettinger, 2.2 in; Fargo, 4.12 in; Hillsboro, 5.78 in

Table. Response of tame buckwheat and mustard to preemergence herbicides (1 MAT).

		Tame buckwheat			Tame mustard		
Treatment	Rate	Fargo	Hillsboro	Hettinger	Fargo	Hillsboro	Hettinger
	oz/A	% injury					
Pursuit	0.5	32	90	0	99	86	0
Prowl H2O	20	2	70	0	3	9	0
Metribuzin	5.33	6	20	13	7	80	0
Spartan	4	63	29	0	27	39	0
Sharpen	0.72	25	65	25	42	99	0
Dual	26	2	1	0	8	25	0
Outlook	16	15	8	0	15	35	0
Zidua	2.5	7	16	0	7	86	0
Callisto	2.5	6	21	0	50	99	22
LSD (p = 0.05)		11	14	4	10	24	1

    e. Evaluated 15 post-applied broadleaf herbicides for safety in buckwheat and mustard.
        i. No postemergence broadleaf herbicides registered for use in buckwheat or mustard

Table. Injury response of tame buckwheat and mustard to postemergence applied herbicides (1 MAT)

		Tame buckwheat			Tame mustard	
	Rate	Fargo	Hillsboro	Hettinger	Fargo	Hettinger
	oz/A	Percent injury				
Ethometsulfuron (Mustar)	0.33	9	26	5	17	5
Cloransulam (FirstRate)	0.357	95	94	81	97	99
2,4-D	4.2	66	69	16	96	89
Clopyralid (Stinger)	4	10	4	0	10	0
Halauxifen (Elevore)	1.12	69	81	49	11	0
Quinclorac (Facet)	21.3	4	6	0	15	0
Metribuzin	8	37	66	7	70	63
Phenmedipham	49	30	77	19	52	64
Desmedipham	61.5	32	25	4	57	16
Bentazon (Basagran)	12	71	76	4	88	74
Pyridate (Tough)	19.2	21	81	10	70	29
Fomesafen (Flexstar)	12.8	95	95	31	97	98
Flumiclorac (Resource)	2	30	67	22	22	0
Carfentrazone (Aim)	0.51	92	98	56	40	4
Pyraflufen (ET)	0.77	66	94	6	16	2
LSD (p=0.05)		7	7	17	17	15

f. Evaluated postemergence grass herbicides for tolerance in tame buckwheat and mustard
    i. Poast (sethoxydim) is only post grass herbicide labelled in buckwheat
    ii. Assure (quizalopfop) and Select (sethoxydim) labelled in mustard
    iii. Three application timings; 4-6 leaf, budding, and full bloom
    iv. No injury observed to any herbicide or application timing
    v. Assure is being submitted through IR-4 and may be available at earliest in 2022

4) Evaluation of new herbicides for weed control and crop safety for crops grown in southwest North Dakota. The desired outcome is to increase the number of herbicides labelled for use in these crops when data shows treatments are beneficial for weed control and crop production (includes trials described above).
    a. Spring wheat: Eleven trials conducted in 2020
    b. Oats: One trials conducted in 2020
    c. Canola: two trials conducted in 2020
    d. Flax: three trials conducted in 2020
    e. Field pea: three trials conducted in 2020
    f. Lentils: three trials conducted in 2020
    g. Chickpea: two trials conducted in 2020
    h. Safflower: two trials conducted in 2020
    i. Sunflower: one trial conducted in 2020
    j. Dicamba and 2,4-D carryover to peas, lentils, chickpea, and sunflowers
    k. Evaluation of adjuvants in burndown herbicide mixes

Presentations and Outreach:

- Wild world of weeds workshop, Online ZOOM. January 19, 2021
- National Sunflower Association Meeting, Online ZOOM, January 6-7, 2021
- Western Society of Weed Science, March 2020
- 2020 North Dakota Weed Control Guide contributor