

## 2018 Winter Advisory Board Meeting

Weed Science Research Update

Caleb Dalley and Daniel Abe

February 7, 2018

### **Current Research Projects for 2017-18:**

- 1) Weed control and varietal tolerance of safflower to Spartan (sulfentrazone)
  - a. Testing five safflower varieties
  - b. Three rates of Spartan (sulfentrazone) (2, 3.5, and 5 oz/A) vs weed free control
  - c. Trials in Hettinger in 2016, 2017, and 2018 and in Williston in 2016 and 2017
  - d. More injury observed in Williston compared with Hettinger in 2016; perhaps related to differences in soil pH, OM
  - e. Safflower added to Spartan Charge 24c label for 2018 with indemnity clause (grower assumes risk for crop injury)
  - f. Funded by ND Oil Seed Council

**Table 1. Safflower variety response to Spartan (sulfentrazone) herbicide at Hettinger and Williston, ND.**

Variety	Williston		Hettinger
	2016	2017	2016
	yield (lbs/acre)		
Cardinal	1742 a	729 a	2272 a
MonDak	1480 bc	531 bc	2082 a
NutraSaff	1169 d	414 c	1884 a
Hybrid 9094	1577 ab	741 a	2402 a
Hybrid 1601	1348 cd	706 ab	2071 a
	yield (lbs/acre)		
<b>Spartan rate</b>			
2 oz/A	1348 b	574 a	2046 a
3.5 oz/A	1371 b	609 a	2079 a
5 oz/A	1396 b	633 a	2244 a
Weed free	1738 a	681 a	2200 a

- 2) Tolerance of flax to PRE herbicides
  - a. Evaluation of ten herbicides for flax tolerance using standard application rates
  - b. Primarily looking for herbicides to control broadleaf weeds
  - c. Trials conducted in Hettinger, Minot, and Carrington
  - d. Dry weather in 2017 limited yield and response to herbicides
  - e. Funded by AmeriFlax

**Table 2. Flax response to preemergence herbicides at Hettinger, ND in 2017**

Treatment	Rate oz/A	Flax Stand plants/m <sup>2</sup>	Height cm	Yield bu/A
Untreated		247a	31.6a	6.3a
Zidua	3	234a	32.3a	7.3a
Spartan + Zidua	4+1.5	253a	32.7a	6.2a
Warrant	1.5	261a	31.6a	6.7a
Dual II Magnum	1.5	237a	31.6a	6.3a
BroadAxe + Dual II Magnum	22.8+5.2	216a	29.8a	5.8a
Fierce	3	245a	32.9a	6.7a
Prowl H2O	3	225a	31.5a	7.2a
Valor	2	262a	31.8a	7.8a
Outlook	18	227a	29.5a	5.6a
Talinor+ CoAct <sup>+</sup> + COC	13.7+2.75	291a	32.4a	6.6a

- 3) Chickpea tolerance to Tough herbicide (pyridate) and broadleaf weed control
  - a. Adjuvant comparison: Tough herbicide applied with crop oil concentrate vs methylated seed oil vs no adjuvant
  - b. Spray volume comparison: Tough herbicide applied at spray volumes of 10, 20, and 30 gallons per acre
  - c. Trials conducted in Minot and Hettinger
  - d. Funded by the North Dakota Crop Protection Product Harmonization and Registration Board minor crops fund
  - e. Dry conditions in 2017 limited growth and yield of chickpea in trials and lack of weed emergence limited evaluation of weed control
  - f. Additional trial conducted in a non-crop area infested with kochia and pigweed

**Table 3. Response of kochia and redroot pigweed to “Tough” herbicide at Hettinger, 2017.**

Treatment	Rate	Timing	Kochia control			Pigweed control	
			14 DAT	28 DAT	35 DAT	14 DAT	28 DAT
- oz/A -			%				
Untreated			0	0	0	0	0
Tough	12	A	43e	36e	31g	55b	58e
Tough	16	A	48de	43e	44f	64b	63e
Tough	24	A	68c	60c	59de	78a	76cd
Tough+COC	24+32	A	80a	79a	78ab	89a	86ab
Tough+MSO	24+32	A	75ab	70b	72abc	80a	77cd
Tough+Select+COC	24+6+32	A	75ab	73ab	68bcd	82a	81bcd
Tough+Select+MSO	24+6+32	A	72bc	72ab	66cd	79a	84abc
Tough+Select+MSO	24+6+32	A	76ab	77ab	80a	83a	92a
Tough+COC	24+32	B					
Tough+Select+COC	12+6+32	A	51d	51d	49ef	64b	74d
Tough+COC	12+32	B					
Tough+Select+COC	24+6+32	A	79a	77ab	77abc	82a	91a
Tough+COC	12+32	B					

- 4) Cover crop tolerance to herbicide carryover from application in wheat
  - a. Nine herbicides applied postemergence in June in wheat vs untreated control
  - b. Nine different cover crops planted in August following wheat harvest
  - c. Evaluation of cover crops for establishment and injury from herbicides applied during wheat crop
  - d. Trials conducted in Hettinger, Carrington, and Fargo in 2016 and 2017

Risk of cover crop injury based on highest damage recorded between five ND locations in 2016 and 2017								
Herbicide	Radish	Turnip	Field Pea	Lentil	Flax	Oats	Barley	Dwarf Essex Rape
Widematch	MR	MR	HR	<del>HR</del>	LR	LR	LR	MR
Huskie	LR	LR	LR	MR	MR	LR	LR	MR
Everest 2.0	MR	MR	LR	MR	LR	LR	LR	MR
Supremacy	LR	LR	LR	LR	LR	LR	LR	LR
Quelex	MR	MR	LR	LR	LR	LR	LR	LR
Powerflex	LR	LR	LR	MR	MR	LR	LR	MR
Goldsky	MR	MR	LR	LR	MR	LR	LR	LR
Varro	MR	LR	LR	LR	LR	LR	MR	LR
Clarity	MR	<del>HR</del>	LR	MR	MR	LR	MR	MR
2,4-D	MR	LR	LR	LR	LR	LR	LR	MR

- 5) 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.
  - a. Spring wheat: eight trials conducted in 2017
  - b. Durum: five trials conducted in 2017
  - c. Canola: two trials conducted in 2017
  - d. Flax: two trials conducted in 2017
  - e. Field pea: two trials conducted in 2017
  - f. Lentils: three trials conducted in 2016
  - g. Safflower: two trials conducted in 2017

**Presentations and Outreach:**

- Best of Best in Wheat, Dickinson and Minot. February 2018
- Wild world on weeds workshop at Fargo, ND. January 2018
- Western Dakota Crops Day at Hettinger, ND. December 2017
- North Central Weed Science Society, St. Louis, MO, December 2017
- Hettinger REC Crop Tour. July 2017
- Western Society of Weed Science, Coeur d'Alene, ID, March 2017
- 2016 North Dakota Weed Control Guide contributor