

Express Safflower Tolerance at Hettinger, ND, 2024

A trial was conducted to evaluate herbicide tolerance in two varieties of safflower that had been selected for tolerance to the herbicide tribenuron-methyl (Express), a herbicide belonging to the sulfonyleurea family which inhibits the ALS enzyme. Safflower was planted on May 16, 2024 into a field that had been previously treated in a combination of pendimethalin, sulfentrazone, and glyphosate to control weeds prior to planting. Safflower was planted using a no-till plot drill at a depth of 1.75 inches and a seeding rate of 20 LB/A. Safflower emerged on May 31. The herbicide tribenuron-methyl (Express) was applied at a rate of 0.0625 lbs active ingredient per acre (2 oz product per acre); a rate that is 4 times the labelled rate when used for weed control in sunflower. This high rate was used to verify the tolerance of safflower beyond what will typically be applied, but what may result in areas of a field where spray overlap occurs. Express was tank-mixed with the herbicide clethodim (Select Max) at 6 oz/a, and methylated seed oil (MSO) at 1% v/v. Treatments were applied to safflower plots on two application dates; June 26 and July 8. Safflower was evaluated for injury two weeks after each treatment timing. Safflower height was also measured two weeks after each herbicide application timing. At maturity, safflower was harvested using a small plot combine to record seed yield. No visible injury was observed during either visual injury evaluation. While there were differences in safflower height, this was mostly due to differences between varieties. Within variety two, safflower height was slightly less when comparing the earlier treatment with the later treatment. However, these treatments were not statistically shorter in height when compared with the untreated control. Safflower yield was numerically lowest in the untreated control, but in most cases, these differences were not significant. Safflower test weight was greater in Variety One compared with Variety Two. Also seed test weight was less in the untreated safflower control compared with the later application timing. Seed yield of safflower was lower than what is typically expected in southwest North Dakota due to the hot and dry weather that occurred during the summer of 2024. The months of July and August were exceptionally hot and dry. From this trial, we saw no adverse effect of applying tribenuron-methyl to these two safflower varieties.

Table 1. Evaluation of the herbicide tribenuron-methyl (Express) on two safflower varieties that have been selectively bred for tolerance to this same herbicide at Hettinger, ND, 2024

Rating Date	Jul-8-2024	Jul-22-2024	Jul-11-2024	Jul-22-2024	Sep-25-2024	Sep-25-2024		
Rating Type	Injury	Injury	height	height	YIELD	Test		
Rating Unit	%	%	cm	cm	LB/A	LB/BU		
Trt-Eval Interval	12 DA-A	14 DA-B	15 DA-A	14 DA-B				
No. Name	Rate							
1	Variety One Untreated	0	0na	66ab	70ab	621bc	43.2b	
2	Variety One Express Select Max MSO	2oz/a 6oz/a 1% v/v	0	0na	65ab	67bc	730a	47.4a
3	Variety One Express Select Max MSO	2oz/a 6oz/a 1% v/v	0	0na	67a	71a	696ab	45.5ab
4	Variety Two Untreated	0	0na	61cd	63de	534c	36.8d	
5	Variety Two Express Select Max MSO	2oz/a 6oz/a 1% v/v	0	0na	58d	60e	570c	39.1cd
6	Variety Two Express Select Max MSO	2oz/a 6oz/a 1% v/v	0	0na	63bc	66cd	681ab	39.7c
LSD P=.05	.	.	3.3	3.3	107.9	2.83		
Standard Deviation	0.0	0.0	2.2	2.2	71.6	1.88		
CV	0.0	0.0	3.48	3.3	11.21	4.48		
Analyzed as	RCB	RCB	RCB	RCB	RCB	RCB		
Replicate F	NaN	NaN	21.537	27.158	26.067	38.621		
Replicate Prob(F)	NaN	NaN	0.0001	0.0001	0.0001	0.0001		
Treatment F	NaN	NaN	9.035	14.498	4.585	18.892		
Treatment Prob(F)	NaN	NaN	0.0004	0.0001	0.0097	0.0001		

Means followed by same letter or symbol do not significantly differ (P=.05, LSD).