Single and Sequential Applications of Express Applied to Express-Tolerant Sunflowers for Canada thistle Control near Scottsbluff, NE during the 2007 Growing Season.

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A field study was initiated near Scottsbluff, Nebraska to compare the effectiveness of Express for Canada thistle control in Express-tolerant sunflowers. The experimental design was a randomized complete block with three replications. Plots were 11 feet wide by 25 feet long and were located on a sandy loam soil with a pH of 7.8 and organic matter content of 2.5%. The experimental site contained a dense population of Canada thistle. The soil at the site was rototilled to a depth of 5 inches during the first week of May to prepare a seedbed for planting sunflowers. Sunflowers, 'Pioneer 63N81', were planted with a Monosem vacuum planter in rows spaced 22 inches apart on May 16. Herbicides were applied preemergence after planting on May 16 and postemergence on June 22 when the sunflower plants were at the 4-leaf stage and Canada thistle plants were 2 to 5 inches tall and July 10 when the sunflower plants were at the 8-leaf stage and thistle plants were 3 to 12 inches tall. Pertinent data on environmental conditions at the time of herbicide application are given in Table 1. Herbicides were applied with a backpack sprayer calibrated to deliver 20 gallons of spray solution per acre at 36 psi pressure using Spraying Systems 11002 VS nozzles.

Postemergence applications of Express plus Assure II did not cause significant sunflower injury. Canada thistle density averaged one plant per square foot on June 22 and shoots were 2 to 5 inches tall. A single early postemergence treatment with Express at 0.008 or 0.016 lb/acre reduced Canada thistle density and vigor 57 to 58% approximately 33 days after treatment and 30 to 47% 83 days after treatment (Table 2). Applying Express at 0.008 lb/acre on June 22 and again on July 10 increased Canada thistle control on September 13 to 63% compared to a single early postemergence treatment which provided 30% control. Increasing the Express rate to 0.016 lb/acre and making two applications resulted in the highest level of Canada thistle control (89%). The utilization of Spartan or Prowl H_2O PRE followed by Express postemergence provided similar Canada thistle control. The addition of Spartan PRE with Express postemergence did not enhance Canada thistle control over that achieved

with Express applied postemergence. The kochia at the research site was not SU-tolerant and all Express treatments provided excellent kochia control.

Utilization of sequential applications of Express at 0.016 lb/acre with Express-tolerant sunflowers provides the grower with an excellent tool for managing Canada thistle in irrigated and dryland cropping systems.

Table 1. Environmental Conditions at the Time of Herbicide Application.

Date	Air temperature	Humidity	Wind speed & direction	Time of day	Sunflower stage of growth	Weed height	
						Kochia	Canada thistle
	(F)	(%)	(mph)			- - - - - - (inches) - - - - - -	
May 16	76	21	3 S	2:00 pm	No growth	No growth	
June 22	72	47	0.5 SE	9:00 am	4-leaf	2	2-5
July 10	66	69	6 NW	9:00 am	8-leaf	5	3-12

Rainfall following herbicide application:

Date	Amount	Date	Amount	Date	Amount
	- (inches) -		- (inches) -		- (inches) -
May 21	0.23	June 22	0.17	July 10	0.18
May 29	0.23	July 8	0.24		

Table 2. Single and Sequential Applications of Express Applied to Express-Tolerant Sunflowers for Canada thistle control.

Herbicide treatment [1]	Rate	Time of application [2]	Sunflower visual injury	Kochia control [3]		Canada thistle control [3]			
			7/2	7/10	7/25	7/10	7/25	8/16	9/13
	(lb/acre)		- - - - - - - - - - - - - - - - - - (%) - - - - - - - - - - - - - - - - - -						
Nontreated			0	0	0	0	0	0	0
Spartan	0.094	PRE							
Express + Assure II + Scoil	0.008 + 0.055	E. Post	0	99	99	42	57	45	30
Spartan	0.094	PRE							
Express + Assure II + Scoil	0.016 + 0.055	E. Post	3	99	99	47	58	57	47
Spartan	0.094	PRE							
Express + Scoil	0.008	E. Post							
Express + Assure II + Scoil	0.008 + 0.055	L. Post	0	99	99	53	83	90	63
Spartan	0.094	PRE							
Express + Scoil	0.016	E. Post							
Express + Assure II + Scoil	0.008 + 0.055	L. Post	3	99	99	52	90	90	80
Spartan	0.094	PRE							
Express + Scoil	0.016	E. Post							
Express + Assure II + Scoil	0.016 + 0.055	L. Post	3	99	99	52	92	97	89
Spartan	0.094	PRE	0	66	83	0	0	13	17
Prowl H_2O	0.83	PRE							
Express + Assure II + COC	0.008 + 0.055	E. Post	2	96	99	50	55	42	32
Prowl H_2O	0.83	PRE							
Express + Assure II + COC	0.016 + 0.055	E. Post	3	96	99	50	60	55	47
Spartan	0.094	PRE							
Express + Assure II + COC	0.008 + 0.055	E. Post	0	99	99	47	52	48	37
Spartan	0.094	PRE							
Express + Assure II + COC	0.016 + 0.055	E. Post	6	99	99	47	77	58	48
Express + Assure II + COC	0.008 + 0.055	E. Post	1	99	99	43	68	55	53
Express + Assure II + COC	0.016 + 0.055	E. Post	3	99	99	50	62	62	47
LSD at 5%	—	—	NS	25	12	10	18	33	40

[1] Spray additives were added to the herbicides applied postemergence at the following rates: methylated seed oil (Scoil) at 1% and Crop oil concentrate (COC) at 1.5% per volume of carrier.

[2] Herbicides applied preemergence (PRE) on May 16, early postemergence (E. Post) on June 22, and late postemergence (L. Post) on July 10.

[3] Visual evaluations of weed control were taken on a scale from 0 equal to no control to 100 equal to death of the plant.