

Table 1. Control of Japanese Brome, wild buckwheat, and common mallow and dry pea response from fall and/or spring herbicide applications at Hettinger, ND, 2023.

Herbicide Treatment ^a	Rate oz/A	Timing ^b	Japanese brome ———— percent control ^c ————	Wild buckwheat percent control ^c	Common mallow ————	Pea Stand plants/A	Pea Height cm	Pea Yield bu/A
1 Untreated			0	0	0	48 -	35 -	1 e
2 Glyphosate	22	Fall	76 c	0 d	0 d	56 -	38 -	40 d
3 Glyphosate	22	Spring	88 b	0 d	0 d	57 -	37 -	48 cd
4 Anthem Flex	4	Fall	98 a	79 c	77 c	52 -	37 -	55 bc
Glyphosate	22	Fall						
5 Anthem Flex	4	Spring	99 a	82 bc	92 a	60 -	37 -	63 ab
Glyphosate	22	Spring						
6 Anthem Flex	2.5	Fall	99 a	78 c	84 bc	50 -	37 -	59 abc
Glyphosate	22	Fall						
Anthem Flex	2	Spring						
Glyphosate	22	Spring						
7 Anthem Flex	4	Fall	99 a	90 a	91 ab	57 -	35 -	69 a
Glyphosate	22	Fall						
Spartan Charge	5	Spring						
Glyphosate	22	Spring						
8 Glyphosate	22	Spring	96 a	79 c	81 c	53 -	36 -	47 cd
Spartan Elite	32	Spring						
9 Fierce	6	Fall	100 a	77 c	89 ab	57 -	36 -	61 ab
Glyphosate	22	Fall						
10 Fierce	7.5	Fall	99 a	80 c	84 bc	56 -	36 -	63 ab
Glyphosate	22	Fall						
11 Fierce	9	Fall	99 a	87 ab	90 ab	54 -	36 -	64 ab
Glyphosate	22	Fall						
LSD P=.05			6.87	6.03	6.27	12.93	3.106	11.76
Standard Deviation			4.77	4.13	4.3	7.47	2.157	8.12
CV			5.5	6.72	6.55	13.62	5.94	15.83
Treatment F			156.18	369.027	388.529	0.608	0.791	22.117
Treatment Prob(F)			0.0001	0.0001	0.0001	0.7854	0.6374	0.0001

^a glyphosate, Roundup PowerMax; Anthem Flex, carfentrazone plus pyroxasulfone; Spartan Charge, carfentrazone plus sulfentrazone; Spartan Elite, sulfentrazone plus pyroxasulfone; Fierce, flumioxazin plus pyroxasulfone. Ammonium sulfate (AMS) was added to all treatments at 8.5 lb/100 gallons; HSOC-MSO Destiny HC (1% v/v) was added to treatments 4-11.

^b Fall herbicide treatments were applied on October 20, 2022; Spring herbicide treatments were applied after planting on April 26, 2023.

^c Weed control was visually evaluated at 2 weeks after pea emergence. Pea stand and height were both measure at 5 weeks after emergence.

Table 2. Description of herbicide application and equipment for treatments applied to weeds in dry pea at Hettinger, ND, 2022-23.

Application description	Application Equipment	
	Fall	Spring
Date	10/20/22	4/26/23
Start Time	10:27 AM	12:01 PM
Stop Time	10:31 AM	12:21 PM
Air Temperature	64 F	66.6, 64.7 F
Relative Humidity (%)	28	37.2, 36.7
Wind Velocity+Dir	7 MPH, W	10.5 MPH, W
Soil Temperature	43 F	50 F
Cloud Cover (%)	10	100

Application description	Application Equipment	
	Fall	Spring
Equipment Type	Tractor	Tractor
Operation Pressure	38 PSI	38 PSI
Nozzle Model	11002	11002
Nozzle Spacing	20 IN	20 IN
Boom Length	100 IN	100 IN
Boom Height	20 IN	19.0 IN
Ground Speed	3.8 MPH	3.7 MPH
Application Amount	10 GAL/AC	10 GAL/AC
Propellant	CO2	CO2

A trial was conducted to evaluate fall and spring herbicide applications for control of weeds in dry peas. Fall treatments were applied on October 20, 2022 and spring treatments were applied on April 26, 2023 immediately following planting. Few weeds other than Japanese brome were present at time of spring application. Dry pea “Shamrock” was planted on April 26 using a no-till drill at a rate of 120 lb/a seed at a depth of 2 inches. Peas emerged on May 10. No injury was observed to dry pea from fall or spring applied treatments. Control of Japanese brome, wild buckwheat, and common mallow were visually evaluated 2 weeks after emergence (WAE) on a scale of 0 to 100% with 0% being no control and 100% being complete control. Japanese brome was controlled 76% with fall application of glyphosate and 88% with spring application of glyphosate. All other treatments controlled Japanese brome 96 to 100%. Wild buckwheat and common mallow were not controlled by fall or spring application of glyphosate. Spring application of Anthem Flex (carfentrazone plus pyroxasulfone) provided similar control of wild buckwheat and slightly better control of common mallow. Splitting application of Anthem Flex, 2.5 oz/A in fall plus 2 oz/A in spring, did not improve control compared with fall application at 4 oz/A. Anthem Flex at 4 oz/A in the fall plus Spartan Charge (carfentrazone plus sulfentrazone) at 5 oz/A in the spring controlled wild buckwheat and common mallow at 90 and 91%, respectively. Spartan Elite (sulfentrazone plus metolachlor) at 32 oz/A applied in the spring controlled wild buckwheat and common mallow at 79 and 81%, respectively. Fierce (flumioxazin plus pyroxasulfone) was applied at 6, 7.5, and 9 oz/A in the fall and controlled wild buckwheat at 77, 80, and 87%, respectively, and controlled common mallow at 89, 84, and 90%, respectively. Dry pea stand and height were not affected by any of the herbicide treatments. Dry pea yield was near 0 bu/A in the untreated control. Glyphosate alone in the fall and spring increased yield to 40 and 48 bu/A, respectively. Anthem Flex fall and spring applications resulted in yields of 55 and 63 bu/A, respectively, while the split application resulted in 59 bu/A. The highest yielding treatments resulted from fall application of Anthem Flex followed by spring application of Spartan Charge at 69 bu/A. Spartan Elite applied in spring resulted in 47 bu/A. Fierce applications in the fall at 6, 7.5, and 9 oz/A resulted in 61, 63, and 64 bu/A. Fall application of residual herbicides reduce weed pressure in the spring at planting and allow for rainfall both in the fall and spring to activate. In the trial this year, there was above normal rainfall in May that effectively activated the spring applied herbicides. In years when spring rainfall is below normal, preemergence herbicides often fail to become active in the soil.