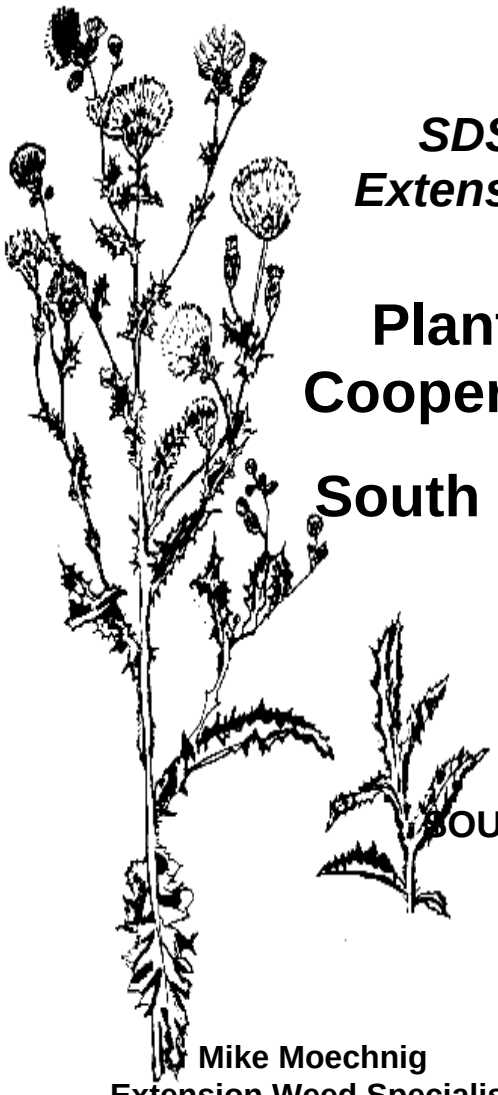
October, 2010

NOXIOUS & PASTURE WEED FIELD PLOT DATA REPORT



SDSU Weed Evaluation and Extension Demonstration Project

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The assistance from Extension Educators and Weed/Pest Supervisors in cooperating counties is acknowledged.

Data reported in this publication are results from field tests that include labeled product uses, experimental products or experimental rates, combinations or other unlabeled uses for herbicide products. Refer to the appropriate weed control fact sheet available from county extension offices for herbicide recommendations.

10/2010

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2010
CANADA THISTLE TIMING with MILESTONE
Clark County

Treatment	***Timing***	***Rate/A***	***% Cath 7/27/10***	***% VCRR Grass 7/28/10***
Check	----	---	0 e	0 a
Milestone	May	7 oz	67 d	0 a
Milestone	May	5 oz	83 b	0 a
Milestone	July	7 oz	96 a	0 a
Milestone	July	5 oz	92 a	0 a
Milestone	August	7 oz	93 a	0 a
Milestone	August	5 oz	88 ab	0 a
Milestone	September	7 oz	95 a	0 a
Milestone	September	5 oz	81 b	0 a
Milestone	October	7 oz	93 a	0 a
Milestone	October	5 oz	74 c	0 a
LSD (.10)			7	0

Applied: May – 5/29/09
July – 7/21/09
August – 8/21/09
September – 9/17/09
October – 10/9/09

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)

Cath=Canada thistle

Comments: The objective of this study was to evaluate the effect of Milestone (aminopyralid) application timing on Canada thistle control. Regardless of rate, Canada thistle control was greatest when Milestone was applied in July or August. At the low rate (5 oz/A), control declined slightly in early spring (May) or fall (September and October) but at the high rate (7 oz/A), control only declined in May. These results indicated that the best time to control Canada thistle with Milestone is June to August and the higher rate may result in more consistent control with fall applications.

2010
CANADA THISTLE TIMING with MILESTONE & AMINOCYCLOPYRACHLOR
Clark County

Treatment	***Timing***	***Rate/A***	***% Cath 7/27/10***	***% VCRR Grass 7/28/10***
Check	----	---	0 c	0 a
Milestone	May	7 oz	87 b	0 a
Aminocyclopyrachlor+NIS	May	1.75 oz a.i.+0.5%	99 a	0 a
Milestone	July	7 oz	99 a	0 a
Aminocyclopyrachlor+NIS	July	1.75 oz a.i.+1%	99 a	0 a
Milestone	August	7 oz	96 a	0 a
Aminocyclopyrachlor+NIS	August	1.75 oz a.i.+1%	99 a	0 a
Milestone	September	7 oz	99 a	0 a
Aminocyclopyrachlor+NIS	September	1.75 oz a.i.+1%	99 a	0 a
Milestone	October	7 oz	87 b	0 a
Aminocyclopyrachlor+NIS	October	1.75 oz a.i.+1%	93 a	0 a
LSD (.10)			4	0

Applied: May – 5/29/09
July – 7/21/09
August – 8/21/09
September – 9/17/09
October – 10/9/09

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)

Cath=Canada thistle

Comments: The objective of this study was to evaluate the effect of Milestone and aminocyclopyrachlor application timing on Canada thistle control. Canada thistle control was greatest among the Milestone treatments when applied in July through September, but declined slightly if applied in early spring (May) or late fall (October). Canada thistle control with aminocyclopyrachlor was similar regardless of the application timing and was similar to or greater than the Milestone treatments at each timing. These results indicated that the optimal herbicide time for Canada thistle control is anytime between June and September and that aminocyclopyrachlor may be slightly more consistent than Milestone. Evaluation will continue next year to compare the longevity of control.

2009-2010
CANADA THISTLE TIMING
Roberts County

Treatment	***Rate/A***	***% Cath 6/9/10***	***Forb Cover 6/9/10***
Check	----	18	29
JUNE			
Milestone	7 oz	87	6
Milestone	5 oz	94	5
Aminocyclopyrachlor+MSO	1.75 oz a.i.+1%	95	3
JULY			
Milestone	7 oz	95	6
Milestone	5 oz	81	9
Aminocyclopyrachlor+MSO	1.75 oz a.i.+1%	99	4
AUGUST			
Milestone	7 oz	87	7
Milestone	5 oz	81	10
Aminocyclopyrachlor+MSO	1.75 oz a.i.+1%	99	4
SEPTEMBER			
Milestone	7 oz	81	7
Milestone	5 oz	84	6
Aminocyclopyrachlor+MSO	1.75 oz a.i.+1%	71	10
LSD (.10)		22	9

Applied: JUNE – 6/9/09
JULY – 7/1/09
AUGUST – 8/5/09
SEPTEMBER – 9/10/09

Cath=Canada thistle

Comments: The objective of this study was to compare Canada thistle control between Milestone (aminopyralid) at 5-7 oz/A to aminocyclopyrachlor at 1.75 oz ai/A. Herbicides were applied in June, July, August, and September 2009. Canada thistle control and the percent of the ground cover by forbs were evaluated in 2010. Forb species included cudweed sagewort, stiff sunflower, prairie coneflower, Canada goldenrod, alfalfa, white prairie aster, wild rose, yarrow, blanketflower, horseweed (marestail), prairie clover, ox-eye daisy, milkweed, evening primrose, and New England aster. There were few treatment differences among the individual forb species, so only total forb cover is reported here to simplify the results. Canada thistle control and forb cover was similar between Milestone and aminocyclopyrachlor at all application dates. All treatments reduced forb cover relative to the untreated check.

2009-2010
HERBICIDE APPLICATION TIMING for CANADA THISTLE CONTROL and FORB TOLERANCE
Roberts County

Treatment	***Rate/A***	***% Cath 6/7/10***	***Forb Cover 6/7/10***
JULY			
Milestone+NIS	3 oz+.25%	83	61
Milestone+NIS	7 oz+.25%	92	54
Milestone	7 oz	92	28
Transline+NIS	1 pt+.25%	82	61
Milestone+Transline+NIS	3 oz+9 oz+.25%	79	47
SEPTEMBER			
Milestone+NIS	3 oz+.25%	88	20
Milestone+NIS	7 oz+.25%	91	23
Milestone	7 oz	88	31
Transline+NIS	1 pt+.25%	81	17
Milestone+Transline+NIS	3 oz+9 oz+.25%	89	40
OCTOBER			
Milestone+NIS	3 oz+.25%	84	35
Milestone+NIS	7 oz+.25%	90	14
Milestone	7 oz	91	30
Transline+NIS	1 pt+.25%	80	30
Milestone+Transline+NIS	3 oz+9 oz+.25%	88	41
Check	----	0	37
LSD (.10)		4	19

Applied: JULY – 7/1/09
SEPTEMBER – 9/10/09
OCTOBER – 10/8/09

Cath=Canada thistle

Comments: The objective of this study was to determine if different herbicide application times would improve forb tolerance without reducing Canada thistle control. Forb species in this study included cudweed sagewort, black-eye Susan, prairie coneflower, Canada goldenrod, white prairie aster, wild rose, yarrow, blanketflower, horseweed (marestail), purple prairie clover, milkweed, alfalfa, and evening primrose. There were few differences in cover of individual forb species among treatments, so only total forb cover was reported here. Canada thistle control was similar among herbicides and application times. Forb tolerance to herbicides applied in July was generally greater or equal forb tolerance to herbicides applied in fall. Adding NIS with Milestone at 7 oz/A or lowering the high Milestones rate (7 oz) generally did not increase forb injury. These results suggest that it may be best to control Canada thistle at the flowering stage in June or July rather than in the fall if you want to minimize forb injury. Results from some studies from the University of Minnesota have also found that spring applications may be safer for forb species.

2009-2010
HERBICIDE APPLICATION TIMING for CANADA and BULL THISTLE CONTROL and FORB TOLERANCE
Roberts County

Treatment	***Rate/A***	***% Cath 6/9/10***	***% Buth 6/9/10***	***Forb Cover 6/9/10***
Check	----	0	0	25
BUD				
Stinger+NIS	8 oz+.25%	90	98	24
BUD & FALL				
Stinger+NIS & Milestone+NIS	8 oz+.25% & 3 oz+.25%	96	96	7
BUD				
Milestone+NIS	3 oz+.25%	95	98	12
Milestone+NIS	5 oz+.25%	97	98	10
Aminocyclopyrachlor+NIS	1.6 oz a.i.+.25%	97	95	27
FALL				
Milestone+NIS	3 oz+.25%	96	90	11
Milestone+NIS	5 oz+.25%	97	90	11
Stinger+NIS	8 oz+.25%	96	88	12
Aminocyclopyrachlor+NIS	1.6 oz a.i.+.25%	98	86	9
LSD (.10)		4	6	10

Applied: BUD – 7/1/09
FALL – 9/29/09

Cath=Canada thistle
Buth=Bull thistle

Comments: The objective of this study was to evaluate herbicide options and application timing to control Canada and bull thistle without severely injuring beneficial forb species. Forb species in this study included cudweed sagewort, black-eye Susan, prairie coneflower, Canada goldenrod, white prairie aster, wild rose, yarrow, blanketflower, horseweed (marestail), purple prairie clover, milkweed, sweet clover, and evening primrose. There were few differences in cover of individual forb species among treatments, so only total forb cover was reported here. Canada and bull thistle control was very good among all the herbicides and herbicide application timings. Forbs were least affected by Stinger (clopyralid) and aminocyclopyrachlor applications at the Canada thistle bud stage. Forbs were most affected by the Stinger followed by Milesone (aminopyralid) applications and the aminocyclopyrachlor application in fall. Therefore, these results indicated that forb injury from aminocyclopyrachlor may be less if applied in the spring rather than in the fall and reducing the Milestone rate to 3 oz/A does not reduce forb injury.

2009-2010
CANADA THISTLE CONTROL AMONG FORBS with MILESTONE & TRANSLINE
Roberts County

Treatment	***Rate/A***	***% Cath 6/9/10***	***Forb Cover 6/9/10***
JULY			
Milestone+NIS	3 oz+.25%	98	7
Milestone+NIS	5 oz+.25%	98	5
Milestone+MSO	5 oz+1 qt	98	6
Milestone+Activator 90	7 oz+.25%	97	8
Transline+NIS	9.2 oz+.25%	95	8
Milestone+Transline+NIS	2 oz+6.12 oz+.25%	95	6
Milestone+Transline+NIS	3 oz+9.2 oz+.25%	96	6
Milestone+Transline+MSO	3 oz+9.2 oz+1 qt	95	8
Milestone+Transline+NIS	4 oz+12.3 oz+.25%	95	8
Milestone+Transline+NIS	5 oz+15.3 oz+.25%	98	7
Check	----	0	17
LSD (.10)		3	4

Applied: JULY – 7/1/09 Cath=Canada thistle

Comments: The objective of this study was to determine if mixtures of Milestone and Transline would be safer on forb species than Milestone alone. Previous studies have indicated that forb species may be more tolerant to Transline (clopyralid) than Milestone (aminopyralid). Forb species in this study included cudweed sagewort, black-eye Susan, prairie coneflower, Canada goldenrod, white prairie aster, wild rose, yarrow, blanketflower, horseweed (marestail), purple prairie clover, milkweed, alfalfa, and evening primrose. There were few differences in cover of individual forb species among treatments, so only total forb cover was reported here. All treatments reduced forb cover. Forb tolerance was not improved by lowering the Milestone rate to 3 oz/A or by mixing Milestone with Transline. All treatments resulted in good control of Canada thistle one year after application.

2010
GRASS PLANTING after CANADA THISTLE CONTROL
Brookings County

Treatment	*Rate/A*	*Cath Count #/sq. m 5/25/10*	*% Cath 7/26/10*	*Cath Cover 7/26/10*	*Forb Cover 7/26/10*	*% Smbr 7/26/10*
JULY & FALL						
Milestone+NIS& Accord XRT II	7 oz+0.25%& 2 qt	1.2 b	50 a	27 a	1 a	57 a
Milestone+Transline+NIS& Accord XRT II	3 oz+9 oz+0.25%& 2 qt	0.8 b	53 a	20 a	1 a	58 a
FALL						
Milestone+Accord XRT II+NIS	3 oz+2 qt+0.25%	3.0 ab	15 bc	50 a	1 a	57 a
Milestone+Durango+NIS	7 oz+2 qt+0.25%	1.2 b	24 abc	38 a	1 a	50 a
Transline+Durango+NIS	16 oz+2 qt+0.25%	5.3 a	0 c	39 a	1 a	48 a
Milestone+Transline+ Accord XRT II+NIS	3 oz+9 oz+ 2 qt+0.25%	0.7 b	35 ab	37 a	1 a	55 a
Durango+NIS	2 qt+0.25%	3.8 ab	15 bc	41 a	2 a	56 a
Journey+NIS	32 oz+0.25%	2.2 b	36 ab	37 a	1 a	61 a
Check	----	2.3 b	0 c	16 a	0 a	0 b
LSD (.10)		2.0	19	21	2	14

Applied: JULY – 7/20/09
FALL – 10/7/09

Cath=Canada thistle
Smbr=Smooth bromegrass

Planted: 11/18/09

Comments: The objective of this study was to evaluate the tolerance of grass and forb species planted after an application of Mielstone (aminopyralid). In this study, Milestone or Milestone + Transline (clopyralid) was applied in July or October to control Canada thistle and glyphosate was applied to each treatment in October to control smooth brome. Smooth brome was only partially controlled and forbs did not establish well, so there were no differences in forb or smooth brome cover among the treatments. There were no forbs present in the untreated check since that treatment was dominated by smooth brome. Canada thistle control was highly variable and less than expected which may have been partially due to the lack of grass cover the year after herbicide applications. Canada thistle shoot densities were greatest in the Transline + Durango treatment. It is difficult to speculate on the reason why the higher rate of Transline increased Canada thistle shoot densities, but I saw a similar response in another study conducted at Lake Andes from 2007 to 2009. Although the results from this study have not yet enabled us to generate conclusions regarding native grass and forb tolerance to Milestone, the results do demonstrate the need for greater efforts to control Canada thistle and smooth brome prior to seeding native grasses and forbs.

2010
GRASS PLANTING after CANADA THISTLE CONTROL
Hutchinson County

Treatment	***Timing***	***Rate/A***	***% Cath 7/26/10***	***% Smbr 7/26/10***	***% Sweet Clover Cover 7/26/10***	***% Forb Cover 7/26/10***
Milestone+NIS& Accord XRT II	JULY FALL	7 oz+0.25%& 2 qt	69 a	71 a	67 a	71 ab
Milestone+Transline+NIS& Accord XRT II	JULY FALL	3 oz+9 oz+0.25%& 2 qt	74 a	73 a	73 a	75 ab
Milestone+Accord XRT II+NIS	FALL	3 oz+2 qt+0.25%	76 a	56 ab	51 a	55 ab
Milestone+Accord XRT II+NIS	FALL	7 oz+2 qt+0.25%	98 a	63 a	68 a	73 ab
Transline+Accord XRT II+NIS	FALL	16 oz+2 qt+0.25%	94 a	76 a	76 a	79 a
Milestone+Transline+ Accord XRT II+NIS	FALL	3 oz+9 oz+ 2 qt+0.25%	92 a	67 a	66 a	70 ab
Accord XRT II+NIS	FALL	2 qt+0.25%	75 a	79 a	66 a	70 ab
Journey+NIS	FALL	32 oz+0.25%	84 a	38 b	5 b	15 b
Check	----	----	0 b	0 c	25 ab	25 ab
LSD (.10)			34	19	34	35

Applied: JULY – 7/16/09
FALL – 10/7/09

Cath=Canada thistle
Smbr=Smooth brome

Comments: The objective of this study was to determine if native grasses and forbs could be planted shortly after a summer or fall Milestone application. Herbicide treatments were applied in July and October and the grass and forb species were planted in November. Forb species in this study included sweet clover, blanketflower, prairie coneflower, plains coreopsis, wild bergamot, milkweed, blackeyed Susan, and New England aster. Sweet clover and milkweed were not planted. For simplicity, only sweet clover and total forb cover was reported here. Canada thistle control from treatments containing Milestone + glyphosate were similar to glyphosate alone. Smooth brome control was marginal to fair among all the treatments and least for Journey, a premix of Plateau and glyphosate. For most treatments, the proportional ground cover of all the forb species ranged from 55-75% but was only 15% after the Journey treatment. This is largely due to the reduction in sweet clover cover, which may not be a negative response for many people who consider sweet clover to be an unwanted weed rather than a desirable forb. I am not sure if the reduction in sweet clover was due to herbicide activity or competition with higher densities of smooth brome. The percent ground cover of the other forb species was similar among all treatments. Unfortunately, the high densities of sweet clover may have suppressed establishment of many of the native grass and forb species. Nevertheless, preliminary results from this study indicated that grass and forb species may be planted late in the fall after summer or fall applications of Milestone. Observations will continue next year.

2009-2010
BULL and CANADA THISTLE AMONG FORBS
Roberts County

Treatment	***Rate/A***	***% Buth 9/14/09***	***% Cath 9/14/09***	***% Cath 6/9/10***	***% Buth 6/9/10***	***Forb Cover 6/9/10***
POSTEMERGENCE						
Milestone+NIS	5 oz+.25%	99	81	87	95	14
2,4-D amine+NIS	1 qt+.25%	99	69	81	94	13
Aminocyclopyrachlor 50DF+ Ally XP+NIS	1 oz a.i.+ 0.333 oz+.25%	99	89	94	93	17
Aminocyclopyrachlor 50DF+ Glean XP+NIS	1 oz a.i.+ 0.167 oz+.25%	99	94	94	96	14
Aminocyclopyrachlor 50DF+ 2,4-D amine+NIS	1 oz a.i.+ 1 pt+.25%	99	85	88	93	15
Check	----	0	0	0	0	29
LSD (.10)		0	22	8	8	8

Applied: 6/9/09

Buth=Bull thistle
Cath=Canada thistle

Comments: The objective of this study was to evaluate bull thistle and Canada thistle control among forbs and grasses with aminocyclopyrachlor. The aminocyclopyrachlor and Milestone treatments resulted in very good Canada and bull thistle control one year after application. All treatments reduced the ground cover of forb species that included cudweed sagewort, black-eye Susan, prairie coneflower, Canada goldenrod, white prairie aster, wild rose, yarrow, blanketflower, horseweed (marestail), purple prairie clover, milkweed, and evening primrose. There were few differences in cover of individual forb species among treatments, so only total forb cover was reported here. It is interesting to note that Milestone and aminocyclopyrachlor caused no more forb suppression than 2,4-D.

2009-2010
LEAFY SPURGE TIMING
Moody County

Treatment	*Rate/A*	*% Lesp 9/23/09*	*% VCRR Smooth brome 9/23/09*	*% VCRR Intermediate wheatgrass 9/23/09*	*% Lesp 6/8/10*	*% VCRR Smooth brome 6/8/10*	*% Lesp 9/15/10*	*% VCRR Smooth brome 9/15/10*
Check	----	0 c	0 a	0 d	0 g	0 b	0 f	0 a
FLOWER								
Aminocyclopyrachlor+MSO	2 oz ai+1%	95 ab	10 a	31 bc	92 ab	44 a	81 b	5 a
Tordon+2,4-D ester	1.5 pt+1 qt	88 ab	5 a	8 d	80 cd	5 b	67 bc	0 a
Plateau+MSO+28% N	8 oz+1 qt+1 qt	88 ab	0 a	76 a	70 e	5 b	35 e	0 a
Tordon+Plateau+ 2,4-D ester+MSO	1 pt+4 oz+ 1 qt+1 qt	89 ab	0 a	76 a	80 cd	5 b	72 bc	0 a
Tordon+Overdrive	1 pt+4 oz	82 b	0 a	20 cd	81 cd	0 b	70 bc	0 a
Aminocyclopyrachlor+ Overdrive+MSO	1 oz ai+ 4 oz+1%	99 a	6 a	44 b	99 a	50 a	93 a	5 a
FALL								
Aminocyclopyrachlor+MSO	2 oz ai+1%				90 b	24 b	73 bc	0 a
Tordon+2,4-D ester	1.5 pt+1 qt				74 de	0 b	64 bc	0 a
Plateau+MSO+28% N	8 oz+1 qt+1 qt				94 ab	5 b	76 b	0 a
Tordon+Plateau+ 2,4-D ester+MSO	1 pt+4 oz+ 1 qt+1 qt				75 de	0 b	56 cd	0 a
Tordon+Overdrive	1 pt+4 oz				63 f	0 b	48 d	0 a
Aminocyclopyrachlor+ Overdrive+MSO	1 oz ai+ 4 oz+1%				87 bc	3 b	68 bc	0 a
LSD (.10)		8	11	16	6	13	10	3

Applied: Spring - 6/8/09
Fall - 9/23/09

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Lesp=Leafy spurge

COMMENTS: The objective of this study was to compare leafy spurge control after spring and fall applications of common leafy spurge herbicides. Results from 2009 indicated that most herbicide treatments resulted in similar leafy spurge control, except aminocyclopyrachlor + Overdrive (dicamba + diflufenzopyr) resulted in greater control than Tordon (picloram) + Overdrive. Smooth brome injury was similar among treatments, but tank mixtures with Plateau (imazapic) resulted in significantly greater intermediate wheatgrass injury than the other treatments. Tordon+2,4-D resulted in good leafy spurge control (88%) and caused the least wheatgrass injury (8%). In summary, several herbicide options resulted in good leafy spurge control, but intermediate wheatgrass tolerance differed greatly among herbicide treatments.

Results from 2010 indicated that flowering was a better time to apply Tordon (picloram) + Overdrive (diflufenzopyr + dicamba) or Aminocyclopyrachlor + Overdrive but fall was a better time to apply Plateau (imazapic). In June, it appeared that adding Overdrive with lower aminocyclopyrachlor rates did not help reduce smooth brome injury. By the fall of 2010, it became apparent that adding Overdrive to aminocyclopyrachlor was beneficial, but adding Overdrive to Tordon was no better than adding 2,4-D to a slightly higher rate of Tordon. Also, smooth brome injury was not readily apparent in the fall. These results indicated that aminocyclopyrachlor + Overdrive applied in the spring may be more effective than several other standard treatments.

2009-2010
LEAFY SPURGE TORDON or PLATEAU DOSE RESPONSE
Moody County

Treatment	***Rate/A***	***% Lesp 6/1/10***	***% VCRR Smooth Brome 6/1/10***	***% Lesp 9/15/10***	***% VCRR Smooth Brome 9/15/10***
Check	----	0 e	0 d	0 h	0 a
FALL					
Tordon+NIS	10 oz+0.25%	31 d	0 d	8 g	0 a
Tordon+NIS	20 oz+0.25%	55 c	1 d	26 f	0 a
Tordon+NIS	40 oz+0.25%	82 b	6 d	46 e	0 a
Tordon+NIS	60 oz+0.25%	94 ab	46 a	64 c	0 a
Plateau+MSO+28% N	2 oz+1 qt+1 qt	53 c	4 d	44 e	0 a
Plateau+MSO+28% N	4 oz+1 qt+1 qt	88 ab	18 c	55 d	0 a
Plateau+MSO+28% N	8 oz+1 qt+1 qt	96 a	25 bc	75 b	0 a
Plateau+MSO+28% N	12 oz+1 qt+1 qt	98 a	35 b	86 a	0 a
LSD (.10)		9	10	6	0

Applied: FALL – 9/23/09

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Lesp=Leafy spurge

Comments: The objective of this study was to establish dose response curves for Tordon (picloram) and Plateau (imazapic). Both herbicides were applied in fall which is usually the best time for Plateau applications but the worst time for Tordon applications. By the first spring following the herbicide applications, both herbicides resulted in good leafy spurge control at the high rates. However, by fall the Tordon treatments were providing poor control and the high Plateau rate was providing fair control. These results indicate Plateau may provide longer control than Tordon when applied in the fall.

2009-2010
LEAFY SPURGE CONTROL w/AMINOCYCLOPYRACHLOR
Moody County

Treatment	*Rate/A*	*% Lesp 9/23/09*	*% VCRR Smooth brome 9/23/09*	*% Lesp 6/8/10*	*% VCRR Smooth brome 6/8/10*	*% Lesp 9/15/10*	*% VCRR Smooth brome 9/15/10*
Check	----	0 d	0 d	0 f	4 c	0 e	0 a
SPRING							
Aminocyclopyrachlor 50DF+MSO	0.4 oz ai+1%	19 c	6 cd	13 e	4 c	3 e	0 a
Aminocyclopyrachlor 50DF+MSO	1 oz ai+1%	88 b	19 bc	70 c	11 bc	46 d	0 a
Aminocyclopyrachlor 50DF+MSO	2 oz ai+1%	97 ab	30 b	88 b	29 abc	84 a	0 a
Aminocyclopyrachlor 50DF+MSO	3 oz ai+1%	99 a	51 a	96 a	48 a	90 a	8 a
FALL							
Aminocyclopyrachlor 50DF+MSO	0.4 oz ai+1%			10 e	0 c	0 e	0 a
Aminocyclopyrachlor 50DF+MSO	1 oz ai+1%			43 d	11 bc	10 e	0 a
Aminocyclopyrachlor 50DF+MSO	2 oz ai+1%			73 c	23 abc	56 c	0 a
Aminocyclopyrachlor 50DF+MSO	3 oz ai+1%			86 b	38 ab	73 b	3 a
LSD (.10)		7	12	7	19	7	4

Applied: Spring - 6/8/09
Fall - 9/23/09

VCRR=Visual Crop Response Rating (O=no injury; 100=complete kill)
Lesp=Leafy spurge

COMMENTS: The objective of this study is to evaluate leafy spurge control associated with aminocyclopyrachlor applied in the spring or the fall. Results indicated that amino-cyclopyrachlor at 2 oz wt/A (1 oz ai/A) or greater resulted in greater than 88% leafy spurge control 3 months after application. Smooth brome growth reduction ranged from 19-51% as aminocyclopyrachlor rates ranged from 2-6 oz wt/A. In summary, these results indicated that aminocyclopyrachlor effectively controls leafy spurge, but moderate smooth brome injury may also occur.

Results from 2010 indicated that spring applications may be slightly more effective than fall applications. Smooth brome injury was apparent in June 2010 and was similar among the fall and spring applications. However, smooth brome injury was not apparent in the fall of 2010. Based on these results, it may be best to apply at least 2 oz a.i./A in spring for leafy spurge control.

2009-2010
LEAFY SPURGE CONTROL with DIFLUFENZOPYR
Moody County

Treatment	*Rate/A*	*% Lesp 9/23/09*	*% VCRR Smooth brome 9/23/09*	*% VCRR Intermediate wheatgrass 9/23/09*	*% Lesp 6/8/10*	*% VCRR Smooth brome 6/8/10*	*% Lesp 9/15/10*	*% VCRR Smooth brome 9/15/10*
Check	----	0 c	0 b	0 d	0 d	0 c	0 d	0 d
Plateau+MSO+AMS	6 oz+1%+3.4 lb	71 b	3 b	90 a	5 d	0 c	0 d	0 d
Tordon+NIS	1.5 pt+0.25%	81 ab	10 b	13 cd	67 c	0 c	45 c	0 d
Tordon+2,4-D ester+NIS	1.5 pt+1 qt+0.25%	81 ab	5 b	15 cd	80 b	0 c	44 c	0 d
Tordon+Plateau+ 2,4-D ester+MSO	1 pt+4 oz+ 1 qt+1%	84 ab	0 b	73 ab	79 b	20 b	55 c	0 d
Tordon+Overdrive	1.5 pt+4 oz	87 a	3 b	0 d	83 b	0 c	67 b	0 d
Aminocyclopyrachlor+MSO	2 oz ai+1%	97 a	41 a	45 bcd	96 a	66 a	88 a	25 c
Aminocyclopyrachlor+MSO	2.8 oz ai+1%	99 a	25 ab	56 abc	99 a	69 a	89 a	33 bc
Aminocyclopyrachlor+ diflufenzopyr+MSO	2 oz ai+ 1.25 oz ai+1%	99 a	3 b	35 bcd	99 a	71 a	91 a	53 a
Aminocyclopyrachlor+ diflufenzopyr+MSO	2 oz ai+ 2.5 oz ai+1%	99 a	3 b	54 abc	99 a	66 a	93 a	41 ab
Tordon+diflufenzopyr+MSO	1.5 pt+1.25 oz ai+1%	93 a	3 b	25 cd	92 a	16 bc	71 b	3 d
Tordon+diflufenzopyr+MSO	1.5 pt+2.5 oz ai+1%	95 a	3 b	15 cd	93 a	0 c	75 b	0 d
LSD (.10)		10	15	25	7	11	11	13

Applied: 6/8/09

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Lesp=Leafy spurge

COMMENTS: The objective of this study was to evaluate leafy spurge control associated with tank mixes containing the diflufenzopyr, a component of Overdrive (dicamba + diflufenzopyr). Except for Plateau (imazapic), each herbicide treatment resulted in greater than 80% leafy spurge control 3 months after application. Plateau caused the greatest intermediate wheatgrass injury (90%) whereas aminocyclopyrachlor caused the greatest smooth brome injury (41%). Adding diflufenzopyr to either aminocyclopyrachlor or Tordon (picloram) did not increase grass injury. In summary, it is too early to determine if adding diflufenzopyr to Tordon or aminocyclopyrachlor increased leafy spurge control, but it appears that adding diflufenzopyr did not increase grass injury.

Results from 2010 indicated that the aminocyclopyrachlor treatments resulted in greater leafy spurge control than the Tordon (picloram) treatments, but the aminocyclopyrachlor treatments also resulted in greater smooth brome injury. Leafy spurge control increased when Overdrive (diflufenzopyr + dicamba) or diflufenzopyr was mixed with Tordon but leafy spurge control did not increase when diflufenzopyr was added with aminocyclopyrachlor. This lack of an apparent benefit may be partially due to the very good control of aminocyclopyrachlor alone. Treatment differences may become more apparent next year. Smooth brome injury did increase when diflufenzopyr was added with aminocyclopyrachlor. Results from this study indicate that aminocyclopyrachlor may be an effective herbicide for leafy spurge control.

2008-10
SPRING and FALL LEAFY SPURGE CONTROL with AMINOCYCLOPYRACHLOR
Moody County

Treatment	*Rate/A*	*% Lesp 9/12/08*	*% VCRR Smooth brome 9/12/08*	*% Lesp 6/8/09*	*% VCRR Smooth brome 6/8/09*	*% Lesp 9/23/09*	*% Lesp 9/15/10*	*% VCRR Smooth brome 9/15/10*
Check	----	0 c	0 b	0 c	0 b	0 e	0 b	0 a
SPRING								
Aminocyclopyrachlor+MSO	2 oz ai+1%	89 b	0 b	82 a	0 b	68 ab	23 a	0 a
Tordon+2,4-D ester	1.5 pt+1 qt	87 b	6 b	76 a	0 b	67 ab	5 b	0 a
Plateau+MSO+28% N	8 oz+1 qt+1 qt	88 b	27 a	45 b	0 b	34 d	0 b	0 a
Tordon+Plateau+ 2,4-D ester+MSO	1 pt+4 oz+ 1 qt+1 qt	96 a	25 a	75 a	0 b	71 ab	0 b	0 a
Plateau+Saflufenacil+ NIS+AMS	6 oz+0.36 oz ai+ .25%+3.4 lb	98 a	18 a	78 a	0 b	73 a	0 b	0 a
FALL								
Aminocyclopyrachlor+MSO	2 oz ai+1%	—	—	88 a	22 a	53 c	11 b	0 a
Tordon+2,4-D ester	1.5 pt+1 qt	—	—	52 b	0 b	40 d	1 b	0 a
Plateau+MSO+28% N	8 oz+1 qt+1 qt	—	—	95 a	6 b	68 ab	6 b	0 a
Tordon+Plateau+ 2,4-D ester+MSO	1 pt+4 oz+ 1 qt+1 qt	—	—	87 a	0 b	57 bc	0 b	0 a
Plateau+Saflufenacil+ NIS+AMS	6 oz+0.36 oz ai+ .25%+3.4 lb	—	—	92 a	4 b	59 bc	0 b	0 a
LSD (.10)		6	10	14	12	10	7	2

Applied: SPRING - 6/10/08
FALL - 9/12/08

Lesp=Leafy spurge

VCRR=Visual Crop Response Rating
(0=no response, 100=complete kill)

Comments: The objective of this study was to compare leafy spurge control after spring and fall applications of common leafy spurge herbicides. The June and September evaluations indicated that Tordon was much more effective when applied in the spring rather than in fall whereas Plateau was much more effective when applied in the fall rather than in spring. The September evaluation indicated that aminocyclopyrachlor and the Plateau (imazapic) + growth regulator herbicides were slightly more effective when applied in the spring compared to fall. In summary, these results are consistent with past research that has indicated growth regulator herbicides (Tordon, 2,4-D, diflufenzopyr, and aminocyclopyrachlor) are more effective when applied in the spring than fall whereas Plateau is more effective when applied in the fall than spring.

Results from 2010 indicated that most treatments were not longer providing leafy spurge control. These results indicated that aminocyclopyrachlor may provide fair leafy spurge control for one year after application, but like many other programs, follow-up control efforts may be required on the second year after application. In addition, smooth brome that was originally suppressed seemed to grow back by the second year after application.

2008
LEAFY SPURGE-SPRING SET-UP
Moody County

Treatment	*Rate/A*	*% Lesp 9/12/08*	*% Lesp 6/8/09*	*% VCRR Smooth Brome 6/8/09*	*% Lesp 9/23/09*	*% VCRR Smooth Brome 9/23/09*	*% Lesp 6/8/10*	*% Lesp 9/15/10*	*% VCRR Smooth Brome 9/15/10*
Check	----	0 b	0 e	0 c	0 c	0 b	0 d	0 e	0 a
SPRING									
2,4-D ester	1.5 qt	31 a	48 d	0 c	20 bc	5 b	3 d	0 e	0 a
SPRING & FALL									
2,4-D ester& Plateau+MSO+28% N	1.5 qt& 8 oz+1 qt+1 qt	34 a	98 a	3 c	70 a	18 b	73 b	46 b	0 a
2,4-D ester& Aminocyclopyrachlor+MSO	1.5 qt& 2 oz ai+1%	33 a	96 a	29 b	83 a	71 a	85 a	76 a	0 a
2,4-D ester& Tordon+2,4-D ester	1.5 qt& 1.5 pt+1 qt	32 a	92 a	0 c	58 a	5 b	64 b	28 cd	0 a
2,4-D ester& Tordon+Plateau+ 2,4-D ester+MSO	1.5 qt& 1 pt+4 oz+ 1 qt+1 qt	29 a	95 a	0 c	65 a	0 b	69 b	36 bc	0 a
Mowed& Plateau+MSO+28% N	---- & 6 oz+1 qt+1 qt	0 b	95 a	49 a	58 a	70 a	31 c	0 e	0 a
Mowed& Aminocyclopyrachlor+MSO	---- & 2 oz ai+1%	0 b	91 a	60 a	66 a	73 a	65 b	16 de	0 a
Mowed& Tordon+2,4-D ester	---- & 1.5 pt+1 qt	0 b	73 b	49 a	18 bc	72 a	0 d	0 e	0 a
Mowed& Tordon+Plateau+ 2,4-D ester+MSO	---- & 1 pt+4 oz+ 1 qt+1 qt	0 b	91 a	46 a	30 b	70 a	5 d	0 e	0 a
FALL									
Plateau+MSO+28% N	8 oz+1 qt+1 qt	0 b	97 a	7 c	60 a	8 b	33 c	5 e	0 a
Aminocyclopyrachlor+MSO	2 oz ai+1%	0 b	89 a	25 b	61 a	26 b	60 b	15 de	0 a
Tordon+2,4-D ester	1.5 pt+1 qt	0 b	63 c	3 c	15 bc	0 b	5 d	0 e	0 a
Tordon+Plateau+ 2,4-D ester+MSO	1 pt+4 oz+ 1 qt+1 qt	0 b	91 a	1 c	25 bc	13 b	3 d	0 e	0 a
LSD (.10)		6	7	15	19	19	11	11	0

Applied: SPRING - 6/10/08
FALL - 9/12/08

VCRR=Visual Crop Response Rating
(0=no injury; 100=complete kill)
Lesp=Leafy spurge

COMMENTS: The objective of this study was to compare mowing with 2,4-D applications as summer set-up programs for fall herbicide applications. At 9 months after application (June 2009), set-up programs only improved control for the fall Tordon + 2,4-D treatment. For this treatment, a spring 2,4-D application resulted in 92% control, a spring mowing resulted in 73% control, and no set-up resulted in 63% control. The benefit of a spring 2,4-D application became more apparent 12 months after application as this set-up increased leafy spurge control in the Tordon + 2,4-D and the Tordon + Plateau + 2,4-D treatments. There was no apparent benefit of a mowing set-up 12 months after the herbicide applications. In summary, spring 2,4-D treatments can greatly improve spurge control associated with fall Tordon applications but may not be necessary for fall Plateau or aminocyclopyrachlor applications. This may be partially due to reduced activity of Tordon when applied in the fall compared to spring whereas Plateau and aminocyclopyrachlor appear to be effective when applied in the fall.

Results from 2010 indicated that most treatments were only providing 0-46% control but the 2,4-D followed by aminocyclopyrachlor treatment was still providing 76% control. Aminocyclopyrachlor without the 2,4-D set-up was only providing 15% control. Smooth brome injury was not longer apparent 2 years after the herbicide applications. These results indicated that a 2,4-D set-up can dramatically extend the duration of leafy spurge control associated with aminocyclopyrachlor and smooth brome injured from this application will eventually grow back.

2009-2010
YELLOW TOADFLAX CONTROL with AMINOCYCLPYRACHLOR
Edmunds County

Treatment	***Rate/A***	***% Yetf 8/25/10***
Check	----	0 e
AUGUST		
Aminocyclopyrachlor 50DF+MSO	0.25 oz a.i.+1%	48 d
Aminocyclopyrachlor 50DF+MSO	1.25 oz a.i.+1%	68 c
Aminocyclopyrachlor 50DF+MSO	2 oz a.i.+1%	85 b
Aminocyclopyrachlor 50DF+MSO	2.75 oz a.i.+1%	93 a
Aminocyclopyrachlor 50DF+MSO	3.5 oz a.i.+1%	98 a
LSD (.10)		5.9

Applied: AUGUST – 8/25/09 Yetf=Yellow toadflax

Comments: The objective of this study was to identify an optimal aminocyclopyrachlor application rate for yellow toadflax control. Control was evaluated approximately one year after application. The results indicate that 2-3 oz a.i./A is the optimal rate. Evaluations will continue next year.

2009-2010
YELLOW TOADFLAX APPLICATION TIMING
Edmunds County

Treatment	***Rate/A***	***% Yetf 8/25/10***
Check	----	0 e
AUGUST		
Tordon+Telar XP+COC	1 qt+1.25 oz+0.25%	25 d
Tordon+COC	1 qt+0.25%	16 d
Telar XP+COC	1.25 oz+0.25%	70 c
Aminocyclopyrachlor 50DF+MSO	2.5 oz a.i.+1%	90 a
SEPTEMBER		
Tordon+Telar XP+COC	1 qt+1.25 oz+0.25%	25 d
Tordon+COC	1 qt+0.25%	16 d
Telar XP+COC	1.25 oz+0.25%	18 d
Aminocyclopyrachlor 50DF+MSO	2.5 oz a.i.+1%	80 b
OCTOBER		
Tordon+Telar XP+COC	1 qt+1.25 oz+0.25%	23 d
Tordon+COC	1 qt+0.25%	25 d
Telar XP+COC	1.25 oz+0.25%	25 d
Aminocyclopyrachlor 50DF+MSO	2.5 oz a.i.+1%	83 b
LSD (.10)		7.1

Applied: AUGUST – 8/13/09
SEPTEMBER – 9/25/09
OCTOBER – 10/9/09

Yeft=Yellow toadflax

Comments: The objective of this study was to determine the optimal herbicide application timing for yellow toadflax control. Timing did not affect control from Tordon (picloram) or Tordon + Telar. Yellow toadflax control from Telar (chlorsulfuron) or aminocyclopyrachlor was greatest when applied in August compared to September or October. Aminocyclopyrachlor generally resulted in much greater yellow toadflax control than Tordon or Telar. These results indicated that the best control option is aminocyclopyrachlor applied in August which is the time when yellow toadflax is in full flower and the leaves are completely green.

2009-2010
YELLOW TOADFLAX CONTROL with DIFLUFENZOPYR
Edmunds County

Treatment	***Rate/A***	***% Yetf 8/25/10***
Check	----	0 d
FALL		
Telar XP+MSO	2 oz+1%	55 c
Tordon+MSO	1 qt+1%	63 c
Aminocyclopyrachlor 50DF+MSO	2 oz a.i.+1%	86 a
Tordon+Telar XP+MSO	1 qt+1.25 oz+1%	58 c
Aminocyclopyrachlor 50DF+Telar XP+MSO	2 oz a.i.+1.25 oz+1%	91 a
Tordon+diflufenzopyr+MSO	1.5 pt+10 oz+1%	75 b
Tordon+diflufenzopyr+MSO	1.5 pt+5 oz+1%	63 c
Aminocyclopyrachlor 50DF+diflufenzopyr+MSO	2 oz a.i.+10 oz+1%	95 a
Aminocyclopyrachlor 50DF+diflufenzopyr+MSO	2 oz a.i.+5 oz+1%	95 a
LSD (.10)		7.0

Applied: FALL – 8/25/09 Yetf=Yellow toadflax

Comments: The objective of this study was to determine if tank mixing diflufenzopyr with other common herbicides would improve yellow toadflax control. Diflufenzopyr may be found in Overdrive (diflufenzopyr + dicamba). Yellow toadflax control with Tordon alone was similar to Tordon + Telar or Tordon + diflufenzopyr at 5 oz/A. However, adding 10 oz/A of diflufenzopyr to Tordon did increase yellow toadflax control relative to Tordon alone. Aminocyclopyrachlor resulted in the greatest yellow toadflax control and adding diflufenzopyr did not increase control. Differences among the aminocyclopyrachlor treatments may be more apparent next year. These results indicated that tank mixing high rates of diflufenzopyr with Tordon may improve yellow toadflax control.

2008-10
YELLOW TOADFLAX CONTROL with SINGLE APPLICATIONS
Edmunds County

Treatment	***Rate/A***	***% Yetf 8/25/09***	***% Yetf 8/25/10***
Check	----	0 a	0 c
Telar XP+MSO	1 oz+1%	69 a	71 a
Tordon+MSO	2 qt+1%	40 a	26 bc
Aminocyclopyrachlor+MSO	2 oz ai+1%	86 a	61 ab
Tordon+Telar XP+MSO	1.5 pt+1 oz+1%	43 a	56 ab
Aminocyclopyrachlor+Telar XP+MSO	2 oz ai+1 oz+1%	33 a	24 bc
Tordon+diflufenzopyr+MSO	1.5 pt+2.5 oz ai+1%	59 a	59 ab
Tordon+diflufenzopyr+MSO	1.5 pt+1.25 oz ai+1%	60 a	53 ab
Aminocyclopyrachlor+diflufenzopyr+MSO	2 oz ai+2.5 oz ai+1%	48 a	20 bc
Aminocyclopyrachlor+diflufenzopyr+MSO	2 oz ai+1.25 oz ai+1%	61 a	50 ab
Garlon 4+Clarity+Spartan 4F+NIS	2 pt+1 pt+3 oz+0.25%	38 a	24 bc
Garlon 4+Clarity+MSO	2 pt+1 pt+1%	40 a	48 ab
Garlon 4+MSO	3 pt+1%	78 a	69 a
LSD (.10)		38	25

Applied: 8/18/08

Yetf=Yellow toadflax

COMMENTS: The objective of this study was to evaluate yellow toadflax control associated with several different herbicides and herbicide mixes. Several treatments appeared to provide some control one year after application, but results were highly variable making it difficult to differentiate control among treatments.

Results from 2010 were still highly variable and slightly different than other studies. For example, Telar (chlorsulfuron) seemed much better than Tordon (picloram) or aminocyclopyrachlor which is unusual. Garlon (triclopyr) also seemed to be providing much better control than would normally be suspected. Given the high level of variability in this study, I would not place much confidence in these results.

2007-10
YELLOW TOADFLAX CONTROL at 3 TIMINGS
Edmunds County

Treatment	***Rate/A***	***% Yetf 8/1/08***	***% Yetf 8/25/09***	***% Yetf 8/25/10***
Check	----	0 e	0 b	0 b
POSTEMERGENCE 1				
Tordon+Telar XP+COC	1 qt+1.25 oz+.25%	37 bc	21 ab	0 b
Tordon+COC	1q t+.25%	15 de	34 ab	0 b
Telar XP+COC	1.25 oz+.25%	36 bc	53 ab	0 b
Tordon+diflufenzopyr+COC	1 qt+3.25 oz a.i.+1%	48 b	54 ab	0 b
POSTEMERGENCE 2				
Tordon+Telar XP+COC	1 qt+1.25 oz+.25%	47 b	47 ab	0 b
Tordon+COC	1 qt+.25%	13 de	9 b	0 b
Telar XP+COC	1.25 oz+.25%	32 bcd	33 ab	0 b
Tordon+diflufenzopyr+COC	1 qt+3.25 oz a.i.+1%	43 bc	38 ab	0 b
POSTEMERGENCE 3				
Tordon+Telar XP+COC	1 qt+1.25 oz+.25%	28 bcd	30 ab	0 b
Tordon+COC	1q t+.25%	23 cd	13 b	0 b
Telar XP+COC	1.25 oz+.25%	12 de	6 b	0 b
Tordon+diflufenzopyr+COC	1 qt+3.25 oz a.i.+1%	73 a	78 a	49 a
LSD (.10)		11	31	7

Applied: Postemergence 1: 8/7/07
Postemergence 2: 9/11/07
Postemergence 3: 10/12/07

Yetf=Yellow toadflax

COMMENTS: The objective of this study was to identify optimal herbicide application times for yellow toadflax control. Previous research in Colorado and North Dakota has indicated control is greater when herbicides are applied at or after flowering compared to applications in the vegetative stage, so this study focused on applications during flowering in August, September, and October. Yellow toadflax plants were beginning to desiccate from light frost by the time herbicides were applied in October. Control was evaluated approximately one year after application. Control with Tordon (13-23%) or Tordon+Telar (28-37%) was similar among application dates. Control from Telar was greater when applied in September (36%) compared to the October application (12%). Control with Tordon + diflufenzopyr (another growth regulator herbicide) was greatest after the October application (73%). For most treatments, yellow toadflax control 2 years after application was similar to the control observed one year after application. Consequently, control trends observed in 2008 were still apparent in 2009. Control with Telar was greatest at the earlier application timings and control with Tordon + diflufenzopyr was greatest at the last application timing.

Results from 2010 indicated most treatments were no longer providing any control except the Tordon (picloram) + diflufenzopyr treatment that was applied 3 years ago in October 2007 was still providing about 49% control.

2010
DALMATIAN TOADFLAX CONTROL with AMINOCYCLOPYRACHLOR
Meade County

Treatment	***Rate/A***	***% Datf 8/26/10***	***% Datf Stand Reduction 8/26/10***
FLOWER			
Aminocyclopyrachlor 50DF+NIS	1.5 oz a.i.+0.25%	40 ab	64 ab
Aminocyclopyrachlor 50DF +NIS	2 oz a.i.+0.25%	70 ab	67 ab
Aminocyclopyrachlor 50DF +NIS	2.5 oz a.i.+0.25%	80 ab	75 ab
Aminocyclopyrachlor 50DF +NIS	3 oz a.i.+0.25%	72 ab	77 ab
Aminocyclopyrachlor 50DF +Escort XP+NIS	2.4 oz a.i.+0.61 oz+0.25%	76 ab	85 a
Aminocyclopyrachlor 50DF + Telar XP+NIS	2.5 oz a.i.+1.33 oz+0.25%	87 ab	93 a
Aminocyclopyrachlor 50DF +2,4-D amine+NIS	4.2 oz+31.8 oz+0.25%	84 ab	88 a
Telar XP+NIS	1.33 oz+0.25%	33 b	45 b
Tordon+NIS	1 qt+0.25%	90 a	92 a
Check	----	0 c	0 c
LSD (.10)		31	22

Applied: FLOWER – 7/14/10 Datf=Dalmatian toadflax

Comments: The objective of this study was to determine if aminocyclopyrachlor controls Dalmatian toadflax. Results were somewhat variable, but aminocyclopyrachlor at 4 oz/A or greater and Tordon (picloram) resulted in good control. Telar (chlorsulfuron), which is normally somewhat effective on Dalmatian toadflax, resulted in poor control. Results from this study suggests that aminocyclopyrachlor may be an effective herbicide for Dalmatian toadflax control.

2007-10
GARLIC MUSTARD CONTROL
Minnehaha County

Treatment	*Rate/A*	*% Gamu 5/25/07*	*Gamu Seedling Density 5/8/08*	*% Gamu 5/29/08*	*Gamu Seedling Density 5/4/09*	*% Gamu 6/4/09*	*Gamu Seedling Density 4/28/10*	*% Gamu 5/23/10*
Check	----	0 d	7 a	20 c	18 a	0 b	9 a	75 b
Plateau+MSO+28% N	4 oz+1 qt+1 qt	98 a	24 a	97 a	22 a	97 a	10 a	97 a
Plateau+MSO+28% N	6 oz+1 qt+1 qt	99 a	25 a	99 a	21 a	99 a	7 a	99 a
Journey+MSO+28% N	8 oz+1 qt+1 qt	99 a	17 a	98 a	11 a	74 a	3 a	92 a
Journey+MSO+28% N	16 oz+1 qt+1 qt	98 a	7 a	91 a	7 a	97 a	6 a	98 a
Escort XP+NIS	.5 oz+.25%	97 a	7 a	98 a	2 a	96 a	4 a	99 a
Escort XP+NIS	1 oz+.25%	98 a	9 a	98 a	4 a	99 a	5 a	98 a
Maverick+NIS	1 oz+.25%	91 a	13 a	89 ab	5 a	97 a	4 a	98 a
Maverick+NIS	2 oz+.25%	91 a	21 a	63 b	19 a	90 a	7 a	96 a
Oust XP+NIS	.25 oz+.25%	52 c	21 a	84 ab	14 a	94 a	10 a	87 a
Oust XP+NIS	.5 oz+.25%	73 b	37 a	86 ab	18 a	94 a	5 a	94 a
Valor+NIS	1 oz+.25%	99 a	18 a	98 a	11 a	90 a	6 a	93 a
Valor+NIS	3 oz+.25%	99 a	13 a	99 a	12 a	96 a	3 a	97 a
Goal 2XL+NIS	1 pt+.25%	98 a	9 a	99 a	12 a	98 a	4 a	96 a
Goal 2XL+NIS	2 pt+.25%	96 a	8 a	99 a	7 a	99 a	3 a	99 a
LSD (.10)		8	20	19	19	16	7	8

Applied: April 27, 2007; Rosette stage

VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)
Gamu=Garlic mustard

COMMENTS: The original objective was to evaluate alternative herbicide chemistries and rates for garlic mustard control. The 2007 results indicated most herbicides evaluated were highly effective, even at low rates. However, it seemed that the garlic mustard seedling populations were just as dense the year following herbicide application as before herbicides were applied (this was not measured though). Therefore, the objective has been revised to determine how many years a population will need to be controlled to deplete the seed bank. The same herbicides were applied to each plot in 2008 as in 2007. Control ratings from May 2 were determined for control of rosettes that survived the previous year, not new seedlings. Those results indicated that there were very few surviving garlic mustard plants in any treatment. Seedling densities were similar among treatments and ranged from 7-37 plants/sq ft. Control 3 weeks after application was similar for all treatments and ranged from 63-99%. None of the treatments significantly reduced non-target plant species growth or densities in 2008.

Results from 2009 indicated that garlic mustard seedling densities (seedlings per square foot) were highly variable and did not differ among herbicide treatments and the untreated check. Also, seedling densities in 2009 were relatively similar to densities in 2008 indicating little or no depletion of the seed back. Garlic mustard control in 2009 was similar among herbicide treatments indicating all herbicide treatments were effective. The percent ground cover of non-target plants in 2009 was similar among herbicide treatments and the untreated check indicating that the herbicide treatments did not adversely affect non-target species. In summary, the 2009 results indicated that several herbicides may effectively control garlic mustard without adversely affecting non-target plant species, but even good control rates will not significantly deplete the garlic mustard seed bank after one year.

Results from 2010 indicate that, after 3 years of herbicide applications, garlic mustard seedling densities are finally starting to decline. In all treatments, garlic mustard seedling density was less than 10 seedlings per square foot. As in the previous years, all herbicides and rates seem to provide good control.

2010
WORMWOOD SAGE CONTROL with AMINOCYCLOPYRACHLOR
Beadle County

Treatment	***Rate/A***	***% Abww 8/2/10***	***% Abww 9/9/10***
Check	----	0 b	0 d
SPRING			
Aminocyclopyrachlor 50DF +NIS	0.25 oz a.i.+0.25%	14 b	5 cd
Aminocyclopyrachlor 50DF +NIS	.5 oz a.i.+0.25%	16 b	13 c
Aminocyclopyrachlor 50DF +NIS	1 oz a.i.+0.25%	69 a	72 b
Aminocyclopyrachlor 50DF +NIS	1.5 oz a.i.+0.25%	81 a	87 a
Aminocyclopyrachlor 50DF +NIS	2 oz a.i.+0.25%	88 a	96 a
Aminocyclopyrachlor 50DF + 2,4-D ester+NIS	0.5 oz a.i.+ 1 qt+0.25%	85 a	86 a
LSD (.10)		15	9

Applied: SPRING – 6/22/10 Abww=Absinth wormwood

Comments: The objective of this study was to determine if aminocyclopyrachlor has activity on absinth wormwood or wormwood sage. Results indicated that control was good at rates greater than 1.5 oz a.i./A or 0.5 oz a.i./A + 2,4-D at 1 qt/A.

2007-10
INTEGRATED MANAGEMENT of WORMWOOD SAGE
Codington County

Treatment	*Timing*	*Rate/A*	*% Abww 11/3/07*	*% Abww 9/30/08*	*Grass Yield (g/m^2) 8/20/08*	*% Abww 9/29/09*	*Grass Yield (g/m^2) 8/20/09*	*Grass Yield (g/m^2) 8/20/10*	*Bdlf Yield (g/m^2) 8/20/10*
Untreated Check	----	----	0 c	0 d	271 b	0 c	534 ab	292 bc	2 a
Mowed	Spring 07& Spring 08	----	0 c	35 c	174 b	5 c	226 b	263 bd	4 a
Mowed& Mowed	Spring 07&08 Fall 07&08	----	0 c	4 d	192 b	6 c	225 b	225 c	3 a
Mowed& Mowed& 80 lb/A N	Spring 07&08 Fall 07&08 Spring 07&08	----	0 c	0 d	302 b	0 c	424 ab	339 bc	3 a
Mowed& Mowed& 80 lb/A N	Spring 07&08 Fall 07&08 Fall 07&08	----	0 c	0 d	203 b	2 c	287 b	437 a	5 a
Mowed& 2,4-D ester	Spring 07&08 Fall 07&08	2 qt	99 a	65 b	390 b	80 b	241 b	299 bc	4 a
Mowed& Tordon+ 2,4-D ester	Spring 07&08 Fall 07&08+ Fall 07&08	1 pt+1 qt	99 a	97 a	372 b	99 a	339 ab	278 bc	3 a
2,4-D ester	Spring 07&08	2 qt	58 b	95 a	602 a	99 a	616 a	319 bc	1 a
2,4-D ester& 2,4-D ester	Spring 07&08 Fall 07&08	2 qt& 2 qt	99 a	94 a	706 a	99 a	623 a	375 ab	5 a
Tordon+ 2,4-D ester	Spring 07&08 Spring 07&08	1 pt+ 1 qt	93 a	99 a	731 a	99 a	621 a	296 bc	2 a
LSD (.10)			11	17	175	10	198	69	4

Applied: Spring - 6/9/07 & 6/3/08
Fall - 9/18/07 & 9/30/08

Abww=Absinth wormwood
VCRR=Visual Crop Response Rating (0=no injury; 100=complete kill)

COMMENTS: The objective of this research was to evaluate absinth wormwood (wormwood sage) control with or without herbicides. In September 2008, mowing just in the spring suppressed wormwood sage growth slightly more than spring and fall mowing or mowing with fertilizer applications. 2,4-D application in the spring resulted in 95% control which was similar to 2,4-D applied in the spring and fall (94%) and greater control than spring mowing followed by a fall application of 2,4-D (65%). Herbicide treatments with Tordon applied in either spring or fall resulted in nearly complete control. Mowing reduced grass biomass production by approximately 50%. Consequently, grass biomass in the mowed treatments was similar to that resulting from wormwood sage competition in the untreated check.

Integrated Management of Wormwood Sage (continued . . .)

Results in 2009 suggested that mowing was having almost no effect on wormwood sage control and mowing appeared to decrease control with 2,4-D. The reduction in grass productivity resulting from spring mowing was still visually apparent and unmowed plots produced nearly twice as much grass as the mowed treatments. However, grass yield in the untreated check was similar to the unmowed plots indicated that the grass is beginning to out-compete the wormwood sage. In summary, the 2009 results continue to suggest that mowing is not an effective component of wormwood sage management.

Because 2010 was the last year of the study, all treatments and the untreated check were sprayed with 2,4-D ester at 2 qt/A in June. A final biomass measurement was made in August. Surprisingly, the treatment with annual spring and fall mowing with fall N fertilizer application had the greatest grass biomass in 2010 whereas this treatment was among the least productive in previous years. Perhaps the fall N applications were stimulating root growth which caused more shoot growth when the mowing was discontinued. The other treatment with spring and fall mowing but with spring N fertilizer applications resulted in much less grass biomass indicating that a fall N application is more beneficial. Warm season grasses dominated this site in 2010. Broadleaf biomass, which did not include wormwood sage, was minimal among all the treatments. One of the original objectives of this study was to identify control options that would preserve beneficial broadleaf species, but few broadleaf species were present (even in the untreated checks) by the end of this study so we cannot make a conclusion about forb tolerance to each treatment. In general, results from this study indicated that mowing was not an effective option to control wormwood sage in grasslands. In areas where herbicides cannot be used, it would be better to just let the grass eventually out-compete the wormwood sage, which may take 5 years. Herbicides (2,4-D or Tordon) were the most effective way to quickly deplete the wormwood densities.

2007-10
PRICKLY PEAR CONTROL
Lyman County

Treatment	***Rate/A***	***% Prpc 7/17/08***	***% Prpc 7/5/09***	***% Prpc 8/29/10***
Check	----	0 f	0 d	0 e
Tordon+NIS	.5 pt+.5%	26 de	78 bc	78 c
Tordon+NIS	1 pt+.5%	70 b	93 ab	92 ab
Tordon+NIS	1 qt+.5%	84 a	99 a	98 a
Milestone+NIS	7 oz+.5%	33 d	18 d	18 d
Starane+NIS	2 pt+.5%	68 b	74 c	85 bc
Starane+NIS	3 pt+.5%	84 a	88 abc	91 ab
2,4-D ester+NIS	3 qt+.5%	13 ef	5 d	3 e
Garlon 4+NIS	1 qt+.5%	9 ef	0 d	3 e
Garlon 4+NIS	1 pt+.5%	10 ef	3 d	0 e
Garlon 3A+NIS	45 oz+.5%	10 ef	7 d	5 e
Clarity+NIS	1 qt+.5%	23 de	5 d	11 de
Garlon 4+2,4-D ester+NIS	1 pt+2 qt+.5%	17 def	8 d	5 e
Garlon 4+2,4-D ester+Clarity+ Spartan 4F+NIS	1 pt+1 qt+1 pt+ 3 oz+.5%	21 de	13 d	10 de
Aminocyclopyrachlor 80DF	3.75 oz+1%	46 c	9 d	20 d
LSD (.10)		10	12	8

Applied: Postemergence - 6/20/07 Prpc=Plains prickly pear

COMMENTS: The objective of this study was to evaluate herbicide efficacy on prickly pear control. Specifically, we wanted to evaluate herbicides that could possibly be used in lawns, such as triclopyr, 2,4-D, dicamba, or fluroxypyr. One year after application, Tordon at 1 qt/A provided 84% control which was similar to Starane at 3 pt/A. Starane (fluroxypyr) contains the same active ingredient as Spotlight (fluroxypyr), which is labeled for use in turf. Other herbicides resulted in less control. However, prickly pear may continue to decline two or more years after herbicide application, so evaluations will continue.

Results from 2009 indicated that prickly pear control increased relative to 2008 in the treatments with lower rates of Tordon (picloram). Consequently, prickly pear control associated with Tordon at 1 pt/A was equivalent to Tordon at 1 qt/A. Prickly pear control in the treatment with Starane (fluroxypyr) at 3 pt/A was similar to Tordon at 1 pt/A. Other herbicide treatments did not result in adequate prickly pear control. In summary, lower rates of Tordon may effectively control prickly pear and fluroxypyr may be an alternative option for use in areas where Tordon is restricted. However, be sure to use a fluroxypyr product that is registered for use in non-crop or pasture environments.

Results from 2010 were similar to 2009 indicating that Tordon (picloram) at 1 pt/A and Starane (fluroxypyr) resulted in good prickly pear control.

2010
SPURGE FLAX CONTROL in GRASSLAND
Jackson County

Treatment	***Rate/A***	***% Spfl 8/26/10***
JUNE		
Check	----	0 e
Escort XP+NIS	1 oz+0.25%	66 d
Escort XP+NIS	2 oz+0.25%	79 bc
Telar XP+NIS	1 oz+0.25%	76 c
Telar XP+NIS	2 oz+0.25%	94 a
Remedy+NIS	2 pt+0.25%	87 ab
Tordon+2,4-D ester+NIS	1 pt+1 qt+0.25%	98 a
Milestone+NIS	7 oz+0.25%	98 a
Plateau+MSO+28% N	8 oz+1 qt+1 qt	80 bc
Plateau+Sharpen+NIS+AMS	6 oz+1 oz+0.25%+3.4 lb	98 a
LSD (.10)		8

Applied: 7/15/10 Spfl=Spurge flax

Comments: The objective of this study was to identify effective herbicides for spurge flax control in grassland. Spurge flax is a relatively new annual weed species that is spreading in the Badlands National Park. There is currently little information on control options. Herbicides were applied in July when the spurge flax was about 3 to 8 inches tall. Our results indicated that the most effective herbicides were high rates of Telar (chlorsulfuron), Tordon (picloram) + 2,4-D, Milestone (aminopyralid), or Plateau (imazapic) + Sharpen (saflufenacil). No grass injury was observed among the treatrments.

2010
CHEATGRASS in PASTURES with SPIKE
Jackson County

Treatment	***Rate/A***	***% Jach 6/11/10***	***% Jach 8/26/10***
FALL			
Plateau+NIS	4 oz+0.25%	85 bc	82 a
Plateau+NIS	6 oz+0.25%	82 c	92 a
Spike 80DF+NIS	2.5 oz+0.25%	28 e	13 c
Spike 80DF+NIS	5 oz+0.25%	70 d	39 b
Spike 80DF+NIS	7.5 oz+0.25%	92 ab	82 a
Spike 80DF+NIS	10 oz+0.25%	94 ab	91 a
Check	----	0 f	0 c
LSD (.10)		7	14

Applied: FALL – 10/26/09 Jach=Japanese chess

Comments: The objective of this study was to evaluate Japanese brome (cheatgrass) control in pastures with Spike (tebuthiuron). Plateau (imazapic) is our standard recommendation for Japanese brome control in pasture. Plateau alone provided fair to good control but only the high rates of Spike resulted in good control. No grass injury was noted on other grass species. These results indicated Spike may have some potential for Japanese brome control in pastures, but tank mixing with Plateau may improve control.

2008-10
SMOOTH BROME CONTROL in NATIVE GRASSES with TEBUTHIURON
McCook County

Treatment	***Rate/A***	***% Smbr 6/28/09***	***% Smbr 7/26/10***	***Plumeless thistle Cover 7/26/10***
Check	----	0 c	0 c	0 b
Spike 80DF	0.2 lb	3 c	1 c	0 b
Spike 80DF	0.5 lb	11 c	4 c	0 b
Spike 80DF	1 lb	41 b	13 c	0 b
Spike 80DF	1.5 lb	74 a	40 b	0 b
Spike 80DF	2 lb	92 a	75 a	2 b
Outrider+NIS	2 oz+0.25%	48 b	10 c	0 b
Plateau+Glypro Plus+28% N+MSO	12 oz+16 oz+2 pt+2 pt	40 b	5 c	1 b
Roundup WeatherMax+AMS+NIS	32 oz+2.5 lb+0.25%	71 a	14 c	8 a
LSD (.05)		18	11	2

Applied: 10/28/08 Smbr=Smooth bromegrass

COMMENTS: The objective of this study was to evaluate smooth brome control with Spike (tebuthiuron). Spike is a selective herbicide that may control some cool-season grasses like smooth brome without injuring some warm-season native grass species. The site of this study was entirely dominated by smooth brome. Spike applied at 1.5 lb product/A was required to get greater than 70% smooth brome control. An application of Roundup resulted in similar smooth brome control as Spike at 1.5 lb/A. There was no evaluate of warm-season grass injury because no warm season grasses emerged which was likely due to a lack of warm-season grass seeds in the soil. In summary, results from this study suggested that Spike and Roundup effectively controlled smooth brome.

Results from 2010 indicated that smooth brome control declined greatly for most treatments except the high rate of Spike (tebuthiuron) was still providing some control. Native grasses were not establishing at this site which may be due to a lack of native grass seeds or viable roots in the soil. Consequently, biennial thistles were becoming established in some treatments due to a lack of ground cover. Plumeless thistle ground cover was greatest in the Roundup (glyphosate) treatment. The other treatments may have provided some residual activity to suppress biennial thistle establishment.

2010
SMOOTH BROME CONTROL in GRASSLAND
Jerauld County

Treatment	***Rate/A***	***% Smbr 5/20/10***
FALL		
Check	----	0 d
Spike 80DF	0.2 lb	26 c
Spike 80DF	0.5 lb	55 b
Spike 80DF	1 lb	60 b
Spike 80DF	1.5 lb	73 ab
Spike 80DF	2 lb	68 ab
Spike 80DF+Milestone+NIS	0.75 lb+5 oz+0.25%	73 ab
Outrider+NIS	2 oz+0.25%	85 a
Durango+AMS+NIS	36 oz+2.5 lb+0.25%	66 ab
Check	----	0 d
LSD (.10)		14

Applied: FALL – 11/17/09 Smbr=Smooth brome

Comments: The objective of this study was to determine if Spike (tebuthiuron) could be used to control smooth brome and promote the growth of native warm season grasses. Only high rates of Spike seemed to provide marginal control at one year after application. Outrider (sulfometuron) resulted in similar smooth brome control as Spike. It was difficult to determine if native grass densities were increasing in density. Results from this study indicated that Spike may not provide very good smooth brome control, but control was similar to the current standard practices of applying glyphosate (Durango) or Outrider. We suspect that a September application may improve smooth brome control with Spike, but we have not tested that concept yet.

2008-2010
BUCKBRUSH CONTROL with CHAPARRAL
Hand County

Treatment	***Rate/A***	***% Bubr 9/4/08***	***% Werw 9/4/08***	***% Bubr 7/23/09***	***% Bubr 6/10/10***
POSTEMERGENCE 1					
Chaparral+NIS	2 oz+.25%	99 a	99 a	91 a	78 a
Chaparral+NIS	2.5 oz+.25%	99 a	99 a	82 abc	68 ab
Chaparral+NIS	3 oz+.25%	99 a	99 a	87 ab	77 a
Chaparral+2,4-D ester+NIS	2 oz+2 pt+.25%	99 a	99 a	92 a	86 a
Chaparral+2,4-D ester+NIS	2.5 oz+2 pt+.25%	99 a	99 a	93 a	87 a
2,4-D ester+NIS	4 pt+.25%	97 a	99 a	84 abc	73 ab
Cimarron+Weedmaster+NIS	.25 oz+1 pt+.25%	99 a	98 a	84 abc	72 ab
POSTEMERGENCE 2					
Chaparral+NIS	2 oz+.25%	90 a	88 a	67 b-e	34 cd
Chaparral+NIS	2.5 oz+.25%	92 a	99 a	60 de	19 d
Chaparral+NIS	3 oz+.25%	97 a	99 a	65 b-e	34 cd
Chaparral+2,4-D ester+NIS	2 oz+2 pt+.25%	99 a	98 a	73 a-d	59 b
Chaparral+2,4-D ester+NIS	2.5 oz+2 pt+.25%	98 a	99 a	50 e	40 c
2,4-D ester+NIS	4 pt+.25%	56 b	80 a	61 cde	40 c
Cimarron+Weedmaster+NIS	.25 oz+1 pt+.25%	50 b	61 b	48 e	24 cd
Check	----	0 c	0 c	0 f	0 e
LSD (.10)		9	13	15	

Applied: Postemergence 1 - 6/19/08
Postemergence 2 - 7/18/08

Bubr=Buckbrush
Werw=Western ragweed

COMMENTS: The objective of this study was to evaluate buckbrush control with Chaparral (aminopyralid + metsulfuron). Herbicides were applied in June and July. It is typically recommended to spray buckbrush in spring (late May through June) while the leaves are young to enable herbicide uptake. In this study, all the herbicides applied in June resulted in good control one year after application. Control declined when the herbicides were applied in July. Among the July applications, only Chaparral (2 oz/A) + 2,4-D (1 qt/A) resulted in greater than 70% control. In summary, results from this research indicated that Chaparral provides very good buckbrush control when applied in June but control may decline if applied in July.

Conclusions from 2010 observations were similar to those from 2009 indicating that June applications resulted in greater control than the July applications. Compared with 2009, buckbrush control generally declined by about 10% in 2010 among the June applications but declined by about 20% among the July applications indicating that well timed applications may provide longer control.

2009-10
CHAPARRAL for BUCKBRUSH CONTROL
Hand County

Treatment	***Rate/A***	***% Bubr 10/1/09***	***% Bubr 6/10/10***
POSTEMERGENCE			
Chaparral+NIS	2 oz+0.25%	98 a	21 d
Chaparral+Syl-Tac	2 oz+0.25%	99 a	39 c
Chaparral+NIS	2.5 oz+0.25%	99 a	36 c
Chaparral+NIS	3 oz+0.25%	99 a	62 b
Chaparral+2,4-D ester+NIS	2 oz+1 pt+0.25%	99 a	78 ab
Chaparral+2,4-D ester+NIS	2 oz+2 pt+0.25%	99 a	72 ab
Chaparral+2,4-D ester+Syl-Tac	2 oz+1 pt+0.25%	99 a	73 ab
Chaparral+2,4-D ester+NIS	2.5 oz+1 pt+0.25%	99 a	76 ab
Chaparral+2,4-D ester+NIS	2.5 oz+2 pt+0.25%	99 a	73 ab
Chaparral+2,4-D ester+NIS	3 oz+1 pt+0.25%	99 a	76 ab
2,4-D ester+NIS	4 pt+0.25%	93 b	78 ab
Cimarron Plus+NIS	0.5 oz+0.25%	99 a	65 b
Cimarron Plus+2,4-D ester+NIS	0.5 oz+1 pt+0.25%	99 a	87 a
Chaparral+2,4-D ester+Syl-Tac	2.5 oz+1 pt+0.25%	99 a	66 ab
Check	----	0 c	0 e
LSD (.10)		2	12

Applied: 7/23/09 Bubr=Buckbrush

Comments: The objective of this study was to evaluate buckbrush control with Chaparral (aminopyralid + metsulfuron). Herbicide treatments were applied somewhat late on July 23 as I would normally recommend having buckbrush herbicides applied by the end of June. All treatments seemed to be providing good control 3 months after application. However, the treatments with 2,4-D alone or tank mixes with 2,4-D seemed to be providing the best control 1 year after application.

2010
CORN HERBICIDE PROGRAMS for COVER CROPS (Fescue + Clover)
Brookings County

Treatment	***Rate/A***	***% Kebg 5/29/10***	***% Kebg 6/28/10***
Check	----	0 d	0 d
POSTEMERGENCE 1 & POSTEMERGENCE 2			
Roundup WeatherMax+AMS&	2 oz+2.5 lb&		
Roundup WeatherMax+AMS	10 oz+2.5 lb	0 d	42 b
Roundup WeatherMax+AMS&	5 oz+2.5 lb&		
Roundup WeatherMax+AMS	10 oz+2.5 lb	10 cd	47 b
Roundup WeatherMax+AMS&	10 oz+2.5 lb&		
Roundup WeatherMax+AMS	10 oz+2.5 lb	33 a	55 a
Ignite 280+AMS&	2 oz+2.5 lb&		
Ignite 280+AMS	10 oz+2.5 lb	2 d	2 d
Ignite 280+AMS&	5 oz+2.5 lb&		
Ignite 280+AMS	10 oz+2.5 lb	0 d	0 d
Ignite 280+AMS&	10 oz+2.5 lb&		
Ignite 280+AMS	10 oz+2.5 lb	10 cd	0 d
Atrazine+Prowl H^2O+Select&	0.5 pt+2.5 pt+3 oz&		
Resolve+Harmony 50SG+Cadet+NIS	0.74 oz+0.1 oz+0.2 oz+0.2%	13 cd	17 c
Dual II Magnum+Prowl H^2O+Assure II+NIS&	1 pt+2.5 pt+3 oz+0.2%&		
Option+Resource+NIS	1 oz+4 oz+0.2%	25 ab	10 cd
Accent+NIS&	0.33 oz+0.2%&		
Accent+Buctril+NIS	0.33 oz+1 pt+0.2%	27 ab	20 c
Gramoxone Inteon&	1 pt&		
Accent+Resolve+Buctril+NIS	0.2 oz+0.5 oz+1 pt+0.2%	20 bc	15 c
LSD (.10)		8	7

Applied: POSTEMERGENCE 1 – 4/22/10
POSTEMERGENCE 2 – 5/29/10

Kebr=Kentucky bluegrass

Comments: The objective of this study was to evaluate several herbicide programs for Kentucky bluegrass suppression for a variety of different purposes, such as chemical mowing or sod suppression for planting crops or native grass. The goal here was to severely suppress the sod without killing it. This study was conducted in a low area that was very wet for the entire summer, so the effects from this study may be less than what would happen in other locations where the grass may be drought stressed in the middle of summer. For Roundup (glyphosate), at least 10 fl oz/A was required before the grass suppression was noticeable after the first application, so only 10 fl oz/A was used in the second applications. Ignite (glufosinate), cause significant chlorosis (yellowing) for about 2 weeks after application but had almost no noticeable effect after that time. Gramoxone (paraquat) provided only limited suppression. The preemergence herbicides such as atrazine, Dual (metolachlor), and Prowl (pendimethalin) seemed to provide some short-term limited suppression which was unexpected as I intended to have these herbicides control weeds that may emerge as a result of the suppressed sod rather than suppress the sod themselves. Applications of grass herbicides such as Select (clethodim) or Accent (nicosulfuron) did not provide much grass suppression at the rates used in this study. In conclusion, it appeared that Roundup WeatherMax (4.5 lb a.e./gallon) applied at 10 fl oz/A was the bet herbicide option for Kentucky bluegrass sod suppression.