

**Tall buttercup (*Ranunculus acris* L.) control in 1999 following fall herbicide applications in 1998  
Woodland, MN - Kanabec Co.**

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<u>Trt. No.</u>	<u>Herbicide</u>	<u>Rate ( ai/A)</u>	<u>Rate (Product)</u>	<u>Visual Control 6-10-99</u>	<u>Product Cost (\$/lb ai)</u>	<u>Treatment Cost (\$/A)</u>
1.	MCPA amine	1.0 lb	1 qt (4 lb. gal)	80	4.22**	4.22
2.	MCPA ester	1.0 lb	1 qt (4 lb. gal)	75	4.62	4.62
3.	2,4-D amine	1.0 lb	1 qt (4 lb. gal)	38	3.65	3.65
4.	2,4-D ester	1.0 lb	1 qt (4 lb. gal)	37	3.65	3.65
5.	Metsulfuron-methyl (Ally 60DF)	0.006	0.1 oz	20	517.33	3.11
6.	Metsulfuron-methyl	0.012	0.2 oz	30	517.33	6.21
7.	Metsulfuron-methyl	0.018	0.3 oz	33	517.33	9.32
8.	Triasulfuron (Amber)	0.013	0.28 oz	22	202.66	2.35
9.	Picloram (Tordon 2L)	0.5 lb	1 qt	98	42.89	21.44
10.	2,4-D + picloram	0.9 + 0.1 lb	0.9 qt + 0.2 qt	83	3.65 + 42.89	7.57
11.	2,4-D + clopyralid (Curtail 2.38E)	1.19 lb	2 qt	68	16.61	19.77
12.	2,4-D + triclopyr (Crossbow 3S)	1.5 lb	2 qt	79	17.98	26.97
13.	Quinclorac (Facet 75 DF)*	0.75 lb	1 lb	2	--	--
14.	Dicamba (Banvel 4S)	0.5 lb	0.5 qt	48	21.19	10.60
15.	Weedy check (no herbicide)	—	—	0	--	--
LSD				20.4		
Std Deviation				12.2		
CV				23.9		

\* Facet is not currently labeled for use in pasture

\*\* Costs taken from BU-3157-S, 2000 Cultural and Chemical Weed Control in Field Crops, Univ. of Minnesota except for the cost of Amber which is from Circular W-253, 1999 North Dakota Weed Control Guide, North Dakota State University.

The site was grazed close, 1" grass, and cows removed 8-19-98. Herbicides were fall applied on 9-2-98. Tall buttercup density per 200 square ft plot ranged from 20 to 60 stems and average values did not differ between plots assigned to treatments averaged across replications (tall buttercup presence was uniform across the trial area at application).

Herbicides Applied	Start: 7:45 a.m.	End:9:05 a.m.
GPA	20	
RH	75 %	55 %
Air Temp	45 F	60 F
Soil Temp (2" depth)	50 F	
Soil moisture	very dry	
10 X 20 ft. plots		
3 Replications		

**Results** - Plots were rated for visual control the season following application. The trial area was not grazed following treatment (Facet treatment not cleared for grazing). On June 10, 1999 tall buttercup was in full bloom with stalks up to 2.5 ft in height. Grasses were predominately Kentucky bluegrass (95%) in full bloom, 2.5 ft tall and some timothy (5%), vegetative stage of growth. Tordon 22K at 1 qt product/A provided the best control with only a few scattered stems present the summer following application. The next best level of acceptable control was achieved with these three treatments: MPCA amine or ester, 1 qt product/A, Crossbow, 2 qt product/A, and the 2,4-D + Tordon tank mix, 0.9 + 0.2 qt product/A - all providing similar results. Control with Curtail was similar to these three treatments, but was significantly lower than the level of control provided by 1 qt of Tordon. The rest of the products tested, Banvel, Ally, Amber, 2,4-D and Facet did not adequately control tall buttercup.

As shown by work done by Oliver Strand in the 1970's, MCPA provides good control of tall buttercup, 2,4-D does not. Dicamba (Banvel) may be better than 2,4-D, but for the additional cost, was not a viable treatment for buttercup control. Tordon + 2,4-D provided the best control. Amber, Ally, Facet, Curtail and Crossbow did not exist when Dr. Strand conducted his trials.

In this study, MCPA amine and ester both worked well. Neither the amine or ester formulation of 2,4-D worked well. Ally, a sulfonylurea herbicide, has specific label verbiage for buttercup control at the lowest rate in the labeled rate range, but no rate in the rate range provide acceptable control in this study when fall applied. Amber, another sulfonylurea herbicide, did not provide acceptable control either. These sulfonylurea herbicides may work best when spring applied based on their mode of action, we can not say based on this work. We targeted fall application to get the best perennial root kill with systemic herbicides. Facet has shown promise for other perennial broadleaf pasture weeds such as leafy spurge, but did not have activity on tall buttercup.

Tordon can be used in Minnesota though the label states to be used 'west of the Mississippi River'. This did not address the Mississippi head waters area in Minnesota and appeared to exclude NE Minnesota. That label verbiage was meant to include states west of the Mississippi so all of Minnesota is included on the label. The tank mix of 2,4-D + a reduced rate of Tordon (6.4 oz) maintained control while reducing costs and the environmental risks of higher rates of Tordon used alone. The main environmental concern with Tordon use is damage to deciduous trees with feeder roots in the treatment area, and damage to dicot plants in lower topographical areas where water ponds or dicot plants downstream from the treatment area. Using reduced rates of Tordon (2 to 8 oz/A) with 2,4-D or MCPA will add consistency and broader spectrum of broadleaf species control, compared to Curtail (2,4-D + clopyralid) or Crossbow (2,4-D + triclopyr). Triclopyr (Crossbow) provided tall buttercup control similar to the 2,4-D + Tordon tank mixture, as did MCPA applied alone. Tank mixing MCPA with Tordon does not seem to be discussed on the Tordon label and we did not include this tank mixture in this study. Based on the superior buttercup control of MCPA applied alone compared to 2,4-D applied alone, we should have looked at reduced rates of Tordon with MCPA. This treatment would likely result in buttercup control equal to the higher rate of Tordon applied alone, yet maintain the economic and environmental benefits of reduced Tordon rates.