

ROUNDUP READY/CONVENTIONAL ALFALFA ESTABLISHMENT COMPARED

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Roundup Ready alfalfa was originally released in the fall of 2005, but an injunction on seeding of new acres was put on in late March 2007. This experiment was seeded April 18, 2006 with the objective to evaluate establishment techniques for Roundup Ready compared with a standard conventional variety. The experiment was laid in the field using a randomized complete block with the treatments in a split-plot arrangement and four replicates. The whole plot was two alfalfa varieties, DKA34-17RR and AmeriStand 403T, and the subplot four establishment methods. The establishment methods for the conventional variety was a check with no weed control, Pursuit at 2 fl oz/acre applied at the 3rd trifoliolate leaf stage, Buctril applied at 1 pt/acre with a separate application of Select at 1 pt/acre, and a Paul oat companion crop seeded at 1,200,000 seeds/acre. The establishment methods for the Roundup Ready variety was Roundup at 0.75 lb ae/acre at the 2 to 3 trifoliolate leaf stage, Pursuit at 2 fl oz/acre, Paul oat companion crop, and a Westford barley companion crop seeded at 1,200,000 seeds/acre. The alfalfa was seeded at 10 lb/acre with a conventional double-disc-opener drill into a well-prepared seedbed at Fargo, ND. The soil type is a Fargo clay. Soil test for P and K indicated adequate levels for alfalfa establishment. Plot size was 10 by 30 feet. A rain shortly after seeding resulted in excellent emergence.

Forage yields were determined by harvesting a strip 38 inches by 25 feet with a Carter flail harvester. The first harvest was taken July 3 at 20% bloom, the second August 22 at 80% bloom, and the third October 20 when regrowth was initiating (about 2 to 3 inches in height).

Forage yields were greatest with establishment without a companion crop since three harvests during the seeding year were obtained ([Table 1](#)). Forage yield of the Paul oat and Westford barley harvested at initiation of soft dough were similar but less than the clear-seeded alfalfa. Forage yield of the conventional alfalfa with Pursuit applied was slightly greater than that of the Roundup Ready alfalfa with Roundup or Pursuit applied primarily due to about 10% of the dry matter coming from weeds, note that the check with no herbicide was similar to the Pursuit treatment. The Pursuit treatment did not control the lambsquarter well since the MSO was mistakenly forgotten to be added to the mixture. The Buctril/Select treatment likewise was slight less due to some injury from Buctril. We conclude that the Roundup Ready and conventional alfalfa had similar forage yields in the seeding year and that there was no indication of injury from the Pursuit in this experiment.

Forage yield during the first production year were greater with the conventional variety than the Roundup Ready variety ([Table 2](#)). Forage yields were slightly less in the companion crop established treatments than clear seeded, but there was no difference between the various weed control methods. Weeds were not a factor in 2007.

Forage yield during the second production year were similar among all treatments ([Table 3](#)). Roundup Ready plots established with Paul oat tended to be higher yielding than the conventional plots established with Paul oat. A small area of one plot had significant winter injury in the conventional treatment, which caused the yield relationship.

We conclude that successful, productive stands can be obtained with various establishment techniques with little differences in forage productivity following the seeding year when adequate rainfall is available during initial establishment. Another experiment established elsewhere at Fargo in 2006 had reduced first-year alfalfa production from excessive companion crop competition.

Table 1. Comparison of DKA 34-17RR Roundup Ready and AmeriStand 403T conventional alfalfa with various establishment techniques at Fargo, ND, in 2006.

Establishment method	Harvest dates in 2006			
	7-3	8-22	10-20	Total
	-----tons dry matter/acre-----			
	<u>Roundup Ready</u>			
Westford barley companion crop	2.40	--	--	2.40
Clear seeded; 0.75 lb ae/A Roundup	1.43	1.15	0.74	3.32
Clear seeded; Pursuit [†] @ 2 fl oz/acre	1.42	1.21	0.71	3.34
Paul oat companion crop	2.49	--	--	2.49
	<u>Conventional</u>			
Clear seeded; no herbicide	1.63	1.35	0.78	3.76
Clear seeded; Buctril @ 1 pt/A – Poast @ 1 pt/acre	1.36	1.16	0.80	3.32
Clear seeded; Pursuit [†] @ 2 fl oz/acre	1.71	1.31	0.77	3.79
Paul oat companion crop	2.54	--	--	2.54
LSD 0.05	0.46	NS	NS	0.48
CV, %	16.8	8.8	7.5	10.4

[†]Applied without MSO by mistake. Lambsquarter was not controlled and contributed to yield.

Table 2. Forage yield of DKA 34-17RR Roundup Ready and AmeriStand 403T conventional alfalfa in 2007 after establishment with various techniques at Fargo, ND, in 2006.

Establishment method in 2006	Harvest date in 2007				2007 total	
	6-5	7-5	8-7	9-28		
	-----tons dry matter/acre-----					
	<u>Roundup Ready</u>					
Westford barley companion crop	2.45	1.70	0.91	0.84	5.90	
Clear seeded; 0.75 lb ae/A Roundup	2.50	1.85	0.86	0.87	6.08	
Clear seeded; Pursuit @ 2 fl oz/acre	2.55	1.81	0.85	0.85	6.06	
Paul oat companion crop	2.42	1.95	0.98	0.80	6.15	
	<u>Conventional</u>					
Clear seeded; no herbicide	2.76	2.09	0.91	0.94	6.70	
Clear seeded; Buctril @ 1 pt/A + Poast @ 1 pt/acre	2.76	1.90	1.03	0.96	6.65	
Clear seeded; Pursuit @ 2 fl oz/acre	2.98	1.78	0.88	0.91	6.55	
Paul oat companion crop	2.81	1.90	0.82	0.90	6.43	
LSD (0.05)	RR vs. Conv.	*	NS	NS	NS	*
	Interaction	NS	NS	NS	NS	NS
CV, %		11.4	9.2	12.7	13.1	6.3

Table 3. Forage yield of DKA34-17RR Roundup Ready and AmeriStand 403T conventional alfalfa in 2008 after establishment with various techniques at Fargo, ND, in 2006.

Establishment method in 2006	Harvest date in 2008				2008 total
	6-5	7-5	8-7	9-28	
	-----tons dry matter/acre-----				
	<u>Roundup Ready</u>				
Westford barley companion crop	2.18	1.68	1.25	1.19	6.30
Clear seeded; 0.75 lb ae/A Roundup	2.29	1.72	1.34	1.07	6.43
Clear seeded; Pursuit @ 2 fl oz/acre	2.12	1.67	1.25	1.15	6.20
Paul oat companion crop	2.26	1.78	1.31	1.28	6.63
	<u>Conventional</u>				
Clear seeded; no herbicide	2.12	1.74	1.31	1.29	6.47
Clear seeded; Buctril @ 1 pt/A + Poast @ 1 pt/acre	2.24	1.66	1.26	1.14	6.30
Clear seeded; Pursuit @ 2 fl oz/acre	2.27	1.84	1.20	1.25	6.55
Paul oat companion crop	1.97	1.70	1.14	1.18	5.99
LSD (0.05)	RR vs. Conv.	NS	NS	NS	NS
	Interaction	NS	NS	NS	NS
CV, %		9.1	10.5	8.8	8.3