North Dakota - Oat Companion Crop Management & Alfalfa Yields

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Companion crops compete with under-seeded alfalfa. The objective of the study at Fargo, ND, was to determine if delayed take-out of an oat companion crop reduces stand establishment and forage yields of alfalfa.

Table 1. *2006-2008 Forage yields of DKA34-17RR alfalfa and 'Paul' oats with varying lengths of oat competition.*

Treatment	Growth Stage		Alfalfa Density	2006 Harvest Dates & Yields					2007 Yield	2008 Yield
	Alfalfa	Oats		Cut 1	Cut 2	Cut 1	Cut 2	Total		
			(Plants/ft²) 5/22/06	*Dates*		----------*Tons DM/ac*----------				
Roundup May 19	1st trifoliolate	7"	32	7/6	9/13	0.8	1.4	2.2	7.5	7.4
Roundup May 26	2nd trifoliolate	10"	32	7/14	9/13	0.6	1.3	1.9	7.3	7.3
Roundup May 31	3rd trifoliolate	15"	27	8/3	9/13	0.8	1.2	2.0	7.4	7.3
No Roundup	--	Boot	36	6/14	9/13	2.3	0.7	3.1	7.3	7.1
No Roundup	--	Head	34	6/20	--	2.5	--	2.5	7.1	7.3
No Roundup	--	Soft Dough	36	6/30	--	3.6	--	3.6	6.2	7.0
LSD (0.05)						0.3	0.3	0.4	0.8	NS

On Apr. 18, 2006, 'Paul' oats was seeded at ~2 bushels/ac and DKA34-17RR Roundup-Ready® alfalfa was seeded at 10 lb/ac at an angle to the oat seeding. P and K levels were adequate, but 50 lb N/ac as urea was applied. Six treatments were imposed in replicated plots (Table 1). For Roundup treatments, the first seeding-year harvest was obtained at 30-50% alfalfa bloom due to drought and short growth. Oats contributed little to forage yield. The stage at which oats were taken-out did not affect forage yield. Apparently, soil water availability was the determining factor for yield level, not the date of oat removal.

A second seeding-year harvest was obtained Sept. 13, 2006, for the first four treatments. Delaying oat harvest to soft dough increased oat forage yield, but the alfalfa stands were weak in the heading and soft dough treatments so a second harvest was not obtained. Harvesting the oats at the boot stage allowed some alfalfa regrowth, but second-harvest yield was significantly less than treatments with Roundup.

Total forage yields from four harvests in 2007 were less where oats had been harvested at soft dough in 2006 compared to other oat treatments, but better than anticipated. In 2008, total season yields from four harvests were unaffected by seeding-year oat management. These data suggest that crown development of alfalfa in the soft-dough treatment offset the greater plant numbers in the other treatments.