

**NUTRITIVE VALUE AND RELATIVE FEED VALUE OF 'ALFAGRAZE' ALFALFA
DURING THE SUMMER HAY HARVEST PERIOD**

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Background. The Hay Marketing Task Force of the American Forage and Grassland Council has proposed quality standards for legume, grass, or grass-legume hay. Nutritive entities of this standard include crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), and estimates of digestible dry matter (DDM) and dry matter intake (DMI). From the estimated DDM and DMI, a Relative Feed Value (RFV) index may be calculated. (Table 1).

Table 1. Quality standards for legume, grass, or grass legume hay¹.

Quality Standard	Nutrient Entity					
	CP	ADF	NDF	DDM	DMI	RFV
-----%-----						
Prime	>19	<31	<40	>65	>3.0	>151
1	17-19	31-35	40-46	62-65	3.0-2.6	151-125
2	14-16	36-40	47-53	58-61	2.5-2.3	124-103
3	11-13	41-42	54-60	56-57	2.2-2.0	102-87
4	8-10	43-45	61-65	53-55	1.9-1.8	86-75
5	<8	>45	>65	<53	<1.8	<75

CP = crude protein, ADF = acid detergent fiber, NDF = neutral detergent fiber.

Digestible dry matter (DDM %) = $88.9 - 0.779 \text{ ADF (\% of dry matter)}$.

Dry matter intake (DMI) = $120 / \text{forage NDF (\% of DM)}$.

Relative feed value (RFV) calculated from $(\text{DDM} \times \text{DMI}) / 1.29$.

Reference hay of 100 RFV contains 41% ADF and 53% NDF.

¹Hay Market Task Force, AFGC

The RFV is one method of comparing or ranking forages according to nutritive value estimates. An RFV value of 100 relates to full bloom alfalfa; thus, all other forages and stage of maturity may be ranked accordingly. The RFV should not be used to balance rations, however, it does provide one method of pricing hay. The objective of this experiment was to evaluate the effect of boron (B) on nutritive value of alfalfa as a hay crop.

Research Findings. 'Alfagraze' alfalfa was harvested at about 10% bloom six times from plots that had received three rates of B (Table 2). Level of B had no apparent effect on any of the fiber constituents, and especially lignin, which was the target entity thought to be most affected. The most vivid responses were attributed to harvest date as all fiber components increased and CP decreased with advancing chronological age. At one of the lowest nutritive value periods, July, the

RFV index was 182 which would be classified as Prime.

Application. Alfalfa harvested from bud to 10% bloom during the summer months has the potential to have a high RFV index. Producers also need nutritive analyses of hay to meet nutritional requirements and expected animal performance levels, and for purchasing-selling of hay.

Table 1. Nutritive value of alfalfa plants at three rates of boron at each of six harvest dates.

Treatment Boron (lb/ac)	Harvest Date	NDF %	ADF %	CEL %	LIG %	IVDMD %	CP %	
0	April 11	28.24	24.43	18.84	3.45	68.56	24.93	
2		29.31	27.29	21.72	3.52	70.67	27.70	
4		30.73	28.54	22.47	3.02	72.24	26.97	
		AVG	29.43	26.75	21.01	3.33	70.49	26.53
		STD	1.02	1.72	1.57	0.22	1.51	1.17
0	May 5	28.82	27.94	21.57	4.69	65.13	30.01	
2		32.33	32.69	25.92	4.40	56.37	28.24	
4		29.58	29.86	23.66	4.59	65.24	29.60	
		AVG	30.24	30.16	23.72	4.56	62.25	29.28
		STD	1.51	1.95	1.78	0.12	4.15	0.76
0	June 8	32.44	29.37	23.07	4.55	58.05	25.17	
2		35.85	35.51	28.05	6.28	70.92	24.52	
4		36.49	35.91	27.88	3.53	61.16	23.68	
		AVG	34.93	33.60	26.34	4.79	63.38	24.46
		STD	1.78	2.99	2.31	1.14	5.48	0.61
0	July 13	33.12	29.76	23.16	5.22	54.15	21.39	
2		34.69	30.82	23.84	6.05	54.45	21.48	
4		32.96	30.69	24.65	4.80	52.45	21.44	
		AVG	33.59	30.43	23.88	5.36	53.68	21.43
		STD	0.78	0.47	0.61	0.52	0.88	0.04
0	August 11	31.95	26.78	21.47	4.46	56.01	22.91	
2		27.53	23.48	19.23	3.35	68.36	25.79	
4		30.11	25.82	20.84	2.61	65.46	25.06	
		AVG	29.86	25.36	20.51	3.47	63.28	24.59
		STD	1.81	1.39	0.95	0.76	5.27	1.22
0	Sept. 19	31.34	26.41	20.87	5.23	60.20	25.29	
2		34.01	29.02	22.44	5.90	49.91	22.53	
4		35.24	32.53	25.88	5.70	58.84	22.67	
		AVG	33.53	29.32	23.06	5.61	56.32	23.50
		STD	1.63	2.51	2.09	0.28	4.57	1.27

NDF = neutral detergent fiber; ADF = acid detergent fiber; CEL = cellulose, LIG= lignin; IVDMD = *in vitro* dry matter digestibility; CP = crude protein