

WARM-SEASON ANNUAL LEGUMES FOR FORAGE PRODUCTION IN SOUTHERN HIGH PLAINS

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INTRODUCTION

Alfalfa is the only forage legume that is grown in southeastern, NM. However, alfalfa is a perennial crop that remains in the soil from 3 to 4 years before going in rotation with other crops. There are warm-season annual legumes that provide the benefit of nitrogen fixation as alfalfa does, but they can be used as rotation crop with other non-legume annual crops.

The objective of this study was to assess dry matter (DM) yield and nutritive value of four warm-season annual legumes for forage in southeastern, NM.

MATERIAL AND METHODS

• Two lablab beans [*Lablab purpureus* (L.) Sweet] cv. Rongai and Rio Verde and two cowpea (*Vigna unguiculata* L. Walp.) cv. Iron and Clay and Catjang were sown in 1st June 2009 at NMSU-ASC-Artesia, NM.

• Legumes were sown at a seeding rate of 45.0 kg/ha on a 1.2 x 6.0 m (7.2 m²) plots, on a randomized complete block design, four plots per legume.

• Legumes were irrigated five times during the growing season and fertilized with N 37 kg/ha and P₂O₅ 175 kg/ha at the time of planting.

• Legumes were harvested at 73 and 97 days after planting.

• At the time of harvest a 0.3 kg subsample was taken from each plot, oven-dry at 60°C for 48 H for DM determination. Dry samples were ground to pass a 1 mm screen sieve and analyzed for nutritive value using NIRS system.

• Data were analyzed using the Proc Mixed procedure of SAS with legume as fixed effect and replicate as random effect. Differences among means were tested using LSMEANS with the PDIFF option ($P < 0.05$).

Fig 1. Dry Matter Yield per Harvest and Accumulated of Four Warm-Season Annual Legumes. Vertical bars are for standard error ($P < 0.05$). ASC-Artesia 2009

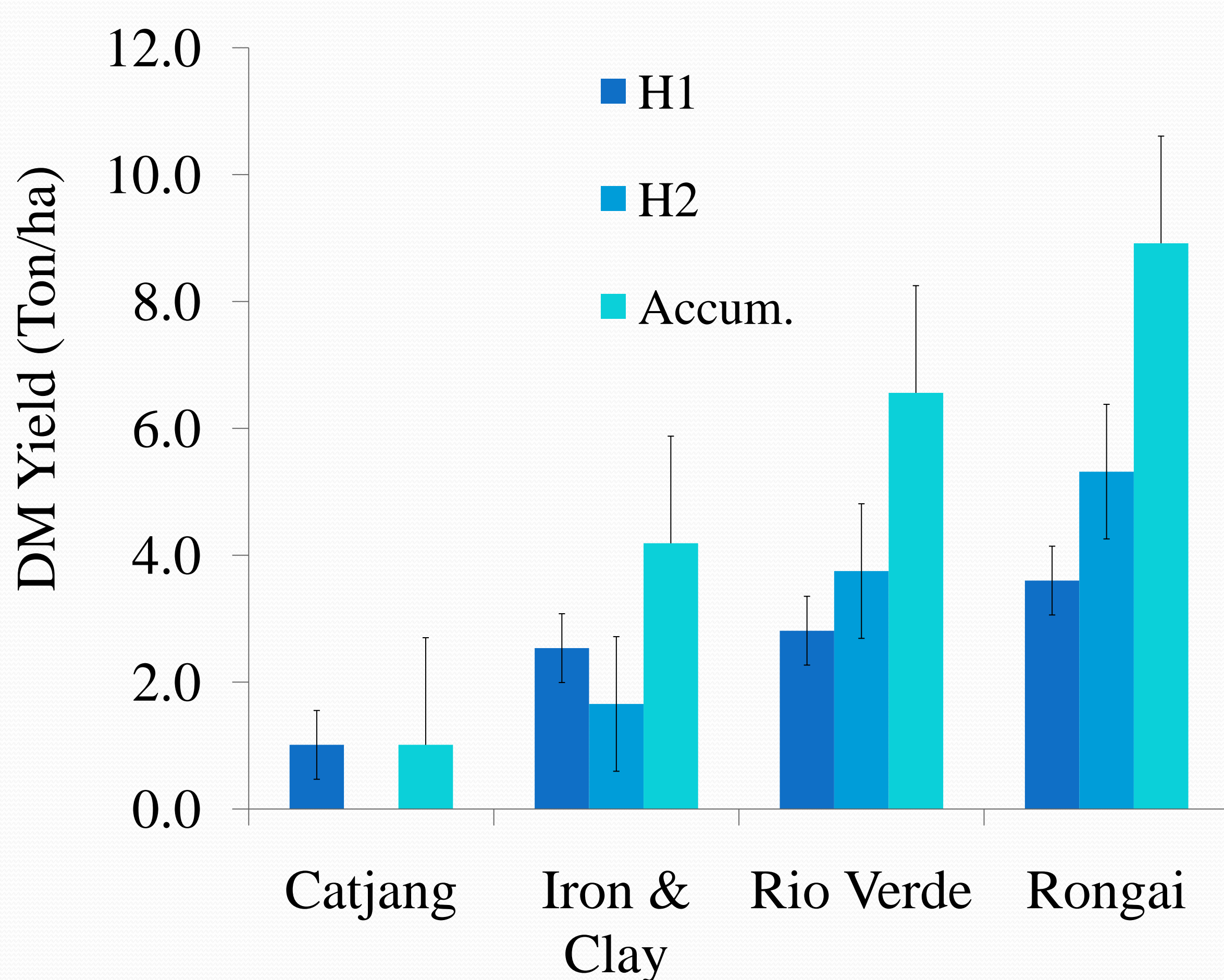


Table 1. Nutritive Value of Four Warm-Season Annual Legumes at First Cut. ASC-Artesia 2009

Legume	DM	CP	NDF	ADF	ADL	NDFD	NE _L	Milk/Ton
	g/kg		g/kg DM			g/kg NDF	Mcal/kg	kg/Ton
Cowpea cv Catjang	159	247	270	243	35	641	1.65	1652
Cowpea cv I & C	140	260	255	228	33	655	1.68	1712
Lablab cv Rio Verde	191	226	279	228	27	672	1.69	1718
Lablab cv Rongai	187	231	297	243	31	616	1.63	1624
SEM	2.8	6.9	11.6	9.4	0.7	17.0	0.02	29.6
P-value	0.001	0.001	0.043	0.262	0.001	0.055	0.061	0.04



RESULTS

❑ Dry matter yield was greater in lablab beans than cowpea beans at both cuttings ($P < 0.05$). Lablab cv Rongai yielded 2.36 ton/ha more than Rio Verde (Fig. 1).

❑ Opposite to DM yield, at first cut cowpea beans had greater CP ($P < 0.001$) and lower NDF ($P < 0.04$) than lablab bean cultivars, with no differences in ADF concentration ($P > 0.262$) (Table 1).

❑ At first cutting NE_L was no different across legumes ($P > 0.061$), but milk/ton was estimated to be greater with lablab cv. Rio Verde and cowpea cv I & C than with lablab cv Rongai or cowpea cv Catjang (Tables 1).

❑ At second cutting, cowpea cv I & C had lower NDF and ADF concentration and greater NE_L and milk/ton than both lablab beans (Tables 2).

Table 2. Nutritive Value of Four Warm-Season Annual Legumes at Second Cut. ASC-Artesia 2009.

Legume	DM	CP	NDF	ADF	ADL	NDFD	NE _L	Milk/Ton
	g/kg		g/kg DM			g/kg NDF	Mcal/kg	kg/Ton
Cowpea cv I & C	158	228	249	229	35	611	1.64	1636
Lablab cv Rio Verde	193	200	316	269	40	587	1.55	1505
Lablab cv Rongai	187	203	324	275	37	587	1.56	1519
SEM	3.7	9.8	11.0	8.0	1.3	14.5	0.02	29.1
P-value	0.001	0.153	0.002	0.005	0.052	0.426	0.006	0.021



CONCLUSIONS

❖ DM yield was higher in lablab bean cultivars than cowpeas both cuts. This study indicates that lablab beans were well adapted to southeastern, NM, and were able to produce good DM yield with good nutritive value.