Current Research on Supplementing Cattle Grazing Limpograss

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INTRODUCTION

Limpograss is a warm season perennial grass adapted to soils with good moisture. Limpograss has several advantages over bahiagrass including higher forage production which supports a higher stocking rate, higher forage production in spring and fall when temperatures are cooler, higher digestibility at similar maturities, accumulated forage has higher quality and cattle have better performance when grazing stockpiled forage. It is similar to bahiagrass in its persistence when inputs of fertilizer are low. Limpograss disadvantages compared to bahiagrass include establishment by vegetative propagation which is more expensive than seeding and its requirement to leave a 6 inch stubble and rotationally graze with a 4 to 6 week regrowth period between grazing periods.

Limpograss usually is 5 to 10 percentage units higher in digestibility than bahiagrass at similar regrowth intervals but in grazing trials gains of growing cattle were similar for both forages (Quesenberry et al., 1984). Crude protein concentrations in limpograss are often less than 6% and may limit cattle performance. The TDN:crude protein ratio (TDN:CP) of limpograss often approaches 10 which is above a TDN:CP ratio of 8 considered to be balanced (Moore et al., 1992). Recent research has evaluated the effects of protein supplements and legumes on the performance of cattle grazing limpograss.

SUPPLEMENTATION TRIALS

The effects of a protein supplement containing urea on the gains of growing cattle grazing limpograss during the summer and early fall (July to October) were evaluated in 2 trials conducted at the Beef Research Unit (Holderbaum et al., 1991). Limpograss was divided into 6 pastures with each pasture grazed 1 week followed by 5 weeks for regrowth. Pastures were fertilized with 110 lb/acre of nitrogen split into 3 applications after each grazing. Daily gains were doubled (.64 vs. 1.30 lb/day) when the urea based protein supplement was fed (Table 1). In 1987 the higher level of protein supplement (.7 lb/day) gave higher gains than the low level (.2 lb/day) of protein supplement but in 1988 the high level of protein supplement gave no additional response over the low level. The higher forage crude protein in 1988 may explain the different response across years.

Blood urea nitrogen (BUN) is responsive to protein concentration in the diet and a concentration below 8 mg/100 ml has been suggested as indicating that protein may be limiting performance (Hammond, 1992). In both years the response to protein supplementation followed the response suggested from BUN levels. This suggests that BUN may be used as an indicator to determine when protein supplements will improve gains.

Aeschynomene seeded into limpograss (no nitrogen fertilizer) also improved gains, forage protein concentrations and BUN concentrations but the gains did not exceed those of cattle supplemented with protein indicating that most of the improvement in daily gain was from the protein provided by the aeschynomene. Early season drought limited aeschynomene production in both years and the limpograss-aeschynomene pastures had a lower stocking rate leading to lower total gain/acre compared to limpograss supplemented with protein.

In 1992, Lima and Sollenberger evaluated the effects of different levels of nitrogen fertilizer (44 and 132 lb/acre) and source of protein supplement on the performance of growing cattle grazing limpograss from early July to early October. Limpograss was divided into 5 pastures with each pasture grazed one week followed by four weeks for regrowth. Pastures were fertilized with 44 or 110 lb/acre of nitrogen split into 3 applications after each grazing. Protein supplements included a urea based supplement and a urea-bypass protein supplement that

provided .3 lb/day of protein not degraded in the rumen.

Protein supplements increased gains similar to previous trials but the response was much less at higher levels of nitrogen fertilization (Table 2). Higher rates of nitrogen fertilizer increased BUN levels and presumably the forage crude protein (analyses not available yet) reducing the response to the protein supplements. The higher rates of nitrogen fertilizer also increased forage production as noted by the higher carrying capacity and total gain/acre. The cattle fed the bypass protein supplement had .25 lb/day higher daily gains indicating the animals protein requirements were not met by microbial protein synthesized in the rumen and undegraded protein in the forage.

SUMMARY

Recent research with growing cattle grazing limpograss pastures during the summer and early fall indicated the following:

1. Daily gains were increased .2 to .7 lb/day when urea based protein supplements were fed.

2. Blood urea nitrogen levels appear to be useful in determining the response to protein supplements and the amount of protein supplement needed.

3. Protein supplements containing natural protein not degraded in the rumen will improve gains of growing cattle in some situations. Further research is needed to define the levels needed for each weight and age of animal.

CONCLUSIONS

Feeding a high protein supplement providing .2 to .5 lb/day of crude protein should improve gains of cattle grazing limpograss. Level of supplement needed will depend on the quantity and timing of nitrogen fertilizer application, forage maturity, season and age of cattle.

REFERENCES

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TABLE 1. **Effect of protein supplement and aeschynomene on the performance of growing cattle grazing limpograss pasture during the summer[a].**

	Treatment			
	Protein Supplement[b]			Limpograss Aeschy-nomene
	None	.2 lb day	.7 lb day	
Daily gain, lb				
1987	.79	1.17	1.41	1.32
1988	.51	1.17	1.19	.97
Blood urea nitrogen, mg/100 ml[c]				
1987	6.2	6.8	11.9	10.4
1988	5.8	9.6	10.9	12.0
Total gain, lb/acre				
1987	176	254	284	191
1988	123	262	232	111
Forage digestibility, %[d]				
1987	60	60	60	65
1988	57	57	57	64
Crude protein, %				
1987	5.8	5.8	5.8	7.8
1988	8.0	8.0	8.0	12.0

[a] Holderbaum et al., 1991 Beef Cattle Research Report, pp 41-44.
[b] Protein provided by urea fed in a corn based supplement.
[c] Concentrations below 8 mg/100 ml indicate protein may be limiting gain.
[d] Invitro organic matter digestibility.

TABLE 2. **Effects of nitrogen fertilizer and protein supplements on the performance of heifers grazing limpograss pasture during the summer (1992)[a].**

	Nitrogen lb/acre	Protein Supplement		
		None	Urea[b]	Bypass[c]
Daily gain, lb	44	.10	.83	1.21
(7-7 to 10-1)	132	.68	.86	.98
Blood urea nitrogen	44	4.1	16.1	16.1
(mg/100 ml)[d]	132	9.1	16.8	17.5
Carrying capacity	44	258	256	265
(head days/acre)	132	294	297	311
Total gain, lb/acre	44	22	212	314
(7-7 to 10-1)	132	197	249	298

[a] Lima and Sollenberger, 1993, personal communication.
[b] Supplement containing 84.9% corn, 12.5% urea, 2.2% Dynamate and .4% limestone was fed at 1.7 lb/day which provided .6 lb/day of rumen available crude protein and .1 lb/day of protein not degraded in the rumen (calculated values).
[c] Supplement containing 42.9% corn, 9.2% urea, 35.5% corn gluten meal, 9.5% blood meal, 2.3% Dynamate and .6% limestone was fed at 1.7 lb/day and provided .6 lb/day of rumen available protein and .3 lb/day of protein not degraded in the rumen (calculated values).
[d] Concentrations below 8 mg/100 ml indicate protein may be limiting gain.