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Range research highlights

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Abstract

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Keywords

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Range Research Highlights

Ed F. Smith

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Late Spring Burning

In the bluestem pasture region of eastern Kansas, late spring burning is now a common practice. It prevents the establishment of woody species, such as red cedar, and increases weight gain of growing cattle about 25 lb per head for the season. Burning date is important in regard to the effect on vegetation and cattle performance. It should be as late as possible so bare soil will be exposed for a minimum period, but not so late as to injure new grass growth. Fall, winter, and early spring burning have been harmful to the more productive warm-season grass species and have not increased cattle gains. However, late spring burning has given an excellent return for the effort expended (see Anderson et al., J. Range Manage. 23:81).

Nitrogen Fertilization

Burned and unburned bluestem pastures were fertilized in early May with 0, 40, or 80 lb nitrogen per acre per year and grazed from May 1 to October 1 with steers. Steer gains were highest on burned pastures with either 0 or 40 lb N/acre. Gains per acre were higher where nitrogen was applied because increased stocking rates were possible. Maintenance of good quality range was favored by burning and 0 or 40 lb N/acre compared with the same fertilizer rates and no burning. At 80 lb N/acre, desirable warm-season species decreased. Forty lb N/acre applied to late-spring-burned pasture was the best combination of treatments. Whether or not to apply nitrogen depends on the cost. Stocking rate for 500 lb steers can be reduced about 1 acre by the use of 40 lb N/acre. Native bluestem pastures should not be fertilized unless they are burned in late spring to control the undesirable species encouraged by nitrogen application (see Owensby and Smith, J. Range Manage. 32:254).

Intensive - Early Summer Stocking

This practice entails stocking at about twice the normal rate early in the growing season, than removing the cattle at mid-season to allow the pasture to

recover. This practice has maintained grass production and favored increases in the more desirable warm-season perennial grasses. Daily gains were slightly improved (1.88 vs 1.75 lb/hd) by intensive grazing, and since more cattle were grazed and the grass was used at its peak nutritive value, gain per acre was much greater (83 vs 62 lb) than normal, season long grazing (see Smith and Owensby, J. Range Manage. 31:14).

Supplementing Winter Grass for Spring Calving Cows

Native pasture contains too little energy and protein for optimum beef cattle performance. How do cows perform when grazing native grass year-round with no supplement other than salt? Exploratory research with young cows (identical twins) on native bluestem pasture over a period of 4 years compared feeding 2 lb of concentrate/cow/daily during the winter with no supplemental feed except salt and limited prairie hay (about 2 weeks per winter when snow covered the grass). Unsupplemented cows calved 10 days later, and their calves weighed less at birth and 23 lb less at weaning. Late calving (April) was critical to the nonsupplemented cows. Because of winter weight loss, earlier calving (in February for example) probably would have been disastrous (see Kans. Ag. Expt. Sta. Bull. 549:46).

Other research involved feeding 3 lb of alfalfa hay to spring-calving Hereford cows on winter bluestem pasture, combined with either 3 or 6 lb of sorghum grain per head daily. Weaning weights of calves from four-year-old and older cows increased from 427 to 444 lb when grain was increased from 3 to 6 lb. But, it required 513 lb of grain (171 days x 3 lb) to achieve the 17 lb increase in weaning weight (see Davis et al., J. Anim. Sci. 45:430).

Spring-calving cows grazing winter bluestem will produce 400 lb calves with only low levels of supplemental feed. Producers whose objective is to wean heavier calves (500 lb or more) need to think in terms of higher quality forage than winter native bluestem pasture and/or feed large quantities of supplemental feed, and they must carefully compare the extra feed costs to the value of the added calf weight.

Supplementing Winter Grass for Growing Cattle

The equivalent of 1 lb of soybean meal and 1 lb of sorghum grain per head daily seems adequate for growing steers where the winter period is followed by summer grazing. Over a 235-day growing period (winter, then summer grass) this combination came within 8 lb of producing as much gain as 2 lb of soybean meal. Other research shows that steers to be summer-grazed following the winter period respond economically to only about 2 lb of supplemental winter concentrate per head daily while being wintered on native grass (see Kans. Ag. Expt. Sta. Bull. 638).

Supplementing Summer Grass for Growing Cattle

As the season progresses and the plants mature from early summer through fall and winter, protein and energy decline to levels below the animals' needs for best performance. By feeding 2 lb of concentrate per head daily, steer gains can be increased 0.25 lb per head daily during early summer, and 0.35 lb during late

summer. Including a feed additive, such as Rumensin®, would add another 0.1 to 0.2 lb per day. The profitability of supplemental feeding depends on the cost of feed, value of the added weight, and the expense of feeding.

On summer grass, the first increments of supplemental feed produce the most gain. Steers on early summer grass normally gain 1.5 to 2.0 lb per head daily, and maximum upside potential is about 1 lb additional gain per day. So, if cattle are fed all the supplemental feed they will consume, a gain increase of about 1 lb per head daily is all that can be expected. (see Kans. Ag. Expt. Sta. Bull. 638).

Management Systems for Growing Cattle

For growing cattle, overhead costs such as interest, depreciation, and taxes are high and nearly equal to feed costs. Certainly at present prices, when growing cattle are fed harvested roughages, gains of 1.5 lb per head daily and higher are necessary. What winter rate of gain should a producer strive for in a 10 or 12-month growing program where winter feeding is followed by summer grazing?

Table 1.1 shows a comparison of growing medium-framed steers on grass winter and summer, compared to feeding harvested forages and grain in the winter followed by summer grazing. The steers fed hay and grain in the winter gained 1.48 lb per head daily. Those wintered on native grass and 2 lb of supplement gained 0.75 lb. During the summer grazing that followed, the steers wintered on pasture showed compensatory gain of 72 lb. The use of winter grass probably depends on availability. Those who have ample grass have the choice of using it; others can use harvested forages or a combination of the two.

If the producer aims for a gain of 1.5 lb per head daily or greater in the earlier (winter) growth phases, it may be desirable because of their fleshy condition, to move the cattle directly to a finishing ration rather than continue the growing program on grass. However, with large-framed steers and with improved performance on grass by the use of supplemental protein, energy and feed additives, this practice needs to be reevaluated.

Summary

Of the management practices reported here, two stand out as rewarding, taking into consideration the resources expended. With a minimum of effort, late spring burning will maintain a pasture in excellent condition and produce an additional 25 lb of gain per steer. Early season intensive stocking will also maintain a pasture in excellent condition and produce 21 lb more gain per acre than season-long stocking at a normal rate.

By supplemental feeding of protein and energy on pasture, performance can be improved. But the deciding factor must be profitability.

This paper outlines several options available to the producer for the use of native grass. Each producer needs to evaluate them under his own conditions and determine if they fit his program.

Table 1.1. Management Systems for Growing Cattle

Item	Wintered in Dry Lot Followed by Summer Grazing	Wintered on Dry Grass Followed by Summer Grazing
Daily Winter Ration, lb/head:		
Prairie Hay	10.4	0.50
Soybean Meal	1.0	2.00
Grain	4.0	-
Winter Bluestem Pasture	-	ad lib.
Gain per Steer, lb:		
Winter, 148 days	219	111
Summer, 151 days	194	266
Total, 299 days	413	377
Variable Costs per Head:[2]		
Hay, $50/ton	$38.48	$1.85
Soybean Meal, $160/ton	11.84	23.68
Grain, $90/ton	26.64	-
Minerals and Salt	1.20	1.20
Winter Grass, 1.5 acres	-	19.50
Summer Grass, 4.0 acres	60.00	60.00
Veterinary Costs	7.00	7.00
Fuel, Oil, Utilities	6.00	6.00
Repairs	5.50	5.50
Misc.	3.50	3.50
Marketing Costs	10.00	10.00
Interest on Cattle, 14%	31.19	31.19
Total Variable Costs	201.35	143.89
Fixed Costs per Steer:		
Depreciation on Bldgs. and Equip.	5.50	5.50
Interest on Bldgs. and Equip.	7.70	7.70
Taxes and Ins. on Bldgs. and Equip.	1.10	1.10
Total Fixed Costs	14.30	14.30
Total Costs per Steer:		
Variable Cost	201.35	143.89
Fixed Cost	14.30	14.30
Steer Cost, 400 lb @ $.68 lb	272.00	272.00
Death loss, 3%	8.16	8.16
Total	493.81	438.35
Return per Steer:		
400 lb + 413 lb @ $0.64/lb	520.32	-
400 lb + 377 lb @ $0.64 lb	-	497.28
Return over Total Cost (less labor)	26.51	58.93
Selling Price Needed to Cover Total Costs (less labor) per Cwt.	$60.74	56.42

[1]Gain values are from Kans. Agr. Expt. Sta. Bull. 638.
[2]Some of these values taken from Kans. Ext. Publ. MF-594, Revised, 1983.