Evaluation of Breeding Seasons for Brood Cows Grazing Winter Range and Bahiagrass Pasture in South Florida

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INTRODUCTION

The season in which cows are bred is important from three perspectives: 1) the nutrition and condition of the cow when it is exposed to the bull, 2) the time of year when the calf is born, and 3) the time of year when the calf is weaned and marketed. It is therefore important for brood-cow managers to breed their herds in the season most appropriate for their operation's location and range composition.

In south Florida, a common management practice is to graze brood cows on range in the fall and winter, which is during the calving season. Cows are then moved to improved pasture in the spring, which coincides with a March-through-June breeding season. But Kirk et al. (1945) shows that weight losses of brood cows grazing range is greatest from December to March, a period when cows are calving and nursing calves. Nutritive value of native forages is lowest during this winter period, which explains the excessive loss of cow weight (Hughes 1974; Long et al. 1986).

A fall-winter range-grazing period followed by spring breeding also has the added disadvantage of not coinciding with a timely burning program-a practice needed to improve the quality of range forages (Duval and Whitaker 1964; Kirk et al. 1974). To prepare native forages for winter grazing, range must be burned in October or early November. Burning at this time is often not possible because of late season rains and soil moisture. Winter burning is more reliable and provides range forage that is relatively high in nutritive value in March and April.

Therefore, having cows graze range in the spring, followed by a summer breeding season on improved pasture may be better than fall-winter range grazing. Yet research data comparing different breeding seasons for cows utilizing native range are not available. The study discussed in this bulletin evaluated a fall-winter range-grazing period, with cows moving to bahiagrass pasture for breeding beginning March 1, vs. a winter-spring range-grazing period, with cows moving to bahiagrass pasture for breeding beginning May 15.

Procedure

In January 1993, 76 Brahman-crossbred cows (mostly Braford) were randomly assigned to two separate breeding-season herds, with 38 cows each, at the Range Cattle Research and Education Center. Cows were four years of age or older. A spring-breeding-season herd was exposed to Braford bulls for 90 days beginning March 1. A summer-breeding-season herd was exposed to Braford bulls for 90 days beginning May 15.

Thirty-two (32) cows from the spring-breeding-season herd and 32 cows from the summer-breeding-season herd were placed on range on October 7, 1993, and December 15, 1993, respectively. Eight cows were randomly assigned to four replicates for the spring breeding season and four replicates for the summer breeding season. Cows in each replicate grazed on 62 acres of unburned, pine-palmetto, flatwoods range. After two months, cows were allowed to graze 62 acres of burned range in addition to the 62 acres of unburned range. Range was burned in October and December for the spring- and summer-breeding-season treatments respectively. Two weeks prior to the start of each breeding season, cows were removed from range, combined as one group (32 cows), and grazed on two 40-acre bahiagrass pastures. Cows remained on bahiagrass until the spring- and summer-breeding herds were placed on range in October and December respectively.

A similar grazing management procedure to that used the first year was followed for the three subsequent years of the study. For the spring- and summer-breeding herds, the average date cows were placed on range was October 4 and December 1 respectively, and the average date cows were removed from range was February 15 and May 7 respectively. In each of the three subsequent years, 32 cows were placed on range for the spring-breeding herd. For the summer-breeding herd, 32 cows were placed on range in the third year and 28 (7 per replicate) cows were placed on range in the second and fourth years. Each year prior to the grazing of each range pasture, plant frequency-of-occurrence and forage dry-matter availability were measured.

Cows were culled from the study if they did not conceive when exposed to bulls. Six cows in each breeding-season treatment either died or were removed from the study for reasons unrelated to the treatment. During the study, 19 and 17 bred, mature, Braford cows from a surplus cow herd maintained year round on bahiagrass pasture were added as replacements to the spring- and summer-breeding herds respectively. To obtain the approximate stocking rates desired, open, mature, Braford cows were placed on range each year. Over four years, 20 open cows were used in each breeding-season treatment.

Spring-bred and summer-bred cows were fed on range with a molasses-urea supplement from mid-December to mid-February and from early March to early May (average of 68 days) respectively. This supplement contained 18% crude protein and was formulated with 95.5% molasses and 4.5% urea. Molasses-urea was fed twice weekly in open troughs at five lb/cow/day.

For the first 68 days on bahiagrass pasture, cows in both breeding-season herds were fed a molasses slurry. Slurry contained 15% crude protein and was formulated from 86% molasses, 7% feather meal, and 7% cottonseed meal. Molasses slurry was fed twice weekly in open troughs at five lb/ cow/day. Cows were offered a mineral supplement free-choice throughout the study.

Cows were weighed and condition scored prior to being placed on range, upon removal from range, and when calves were weaned. Condition scores were visual evaluations based on a range of 1 to 9 (1 = very thin cows, 5 = cows in average condition, and 9 = very fat cows).

Cows were checked twice weekly, and approximate date of calf birth on range was recorded. Calves were weighed and weaned in late August (averaged August 24) and mid-November (averaged November 17) for the spring- and summer-breeding herds respectively. Calf weaning weights were adjusted for sex and to a mean weaning age of 230 days.

Results

Tall-growing grasses, such as bluestems and maidencane, made up 43% of the available forage on range. The average (from 4 years) forage dry matter on unburned range that was available for grazing to spring-bred cows in September was 1960 lb/A, of which 1090 lb/A was estimated as green, grazable forage. Forage dry matter available in December for summer-bred cows was 1750 lb/A, of which 580 lb/A was estimated as green, grazable forage. Grazing treatment did not measurably change forage species composition or dry-matter yield over the four years of this study.

Animal performance data are presented in table 1 .

TABLE 1. Effect of Breeding Season on the Performance of Brood Cows Grazed on Winter Range Followed By Breeding on Bahiagrass Pasture

	Breeding Season			
Item	Spring	Summer	SE	Level of Probability
Number of cows	90	86	-	-
Cow weight to range, lb[a]	1097	1090	12.0	0.70
Cow weight off range, lb[a]	959	1014	11.1	0.01
Cow weight loss on range, lb	-138	-76	8.9	0.01
Cow weight at weaning, lb[a]	1014	986	10.7	0.05
Cow weight change off range to weaning, lb	55	-28	6.8	0.01
Cow condition to range[b]	5.6	5.5	0.14	0.34
Cow condition off range[b]	4.1	4.4	0.10	0.10
Cow condition loss on range	-1.5	-1.1	0.12	0.01
Cow condition at weaning[b]	4.8	4.2	0.11	0.01
Cow condition change off range to weaning	0.7	-0.2	0.12	0.01
Calf weaning weight at 230 days of age, lb[c]	452	398	6.6	0.01

Pregnancy rate, %[d]	76.4	72.6	4.8	0.58

[a] For spring and summer breeding season, average date on range was October 4 and December 1 respectively, average date off range was February 15 and May 7 respectively, and average date at weaning was August 24 and November 17 respectively.

[b] Condition scores were visual observations ranging from 1 to 9; 1 = very thin, 5 = average condition, and 9 = very fat.

[c] Weaning weight was adjusted to 230 days of age. Actual average age of calves at weaning was 227 and 228 days for spring-bred and summer-bred treatments respectively.

[d] Data were only for the first three years. In year 4, summer-treatment cows were not exposed to bulls in order to prepare for a subsequent study.

Cows grazing range from early October to mid-February lost 62 lb more weight than cows grazing range from December through April ($P < 0.01$). As a result, spring-bred cows were 55 lb lighter than summer-bred cows at the end of the range-grazing period ($P < 0.01$).

When grazing bahiagrass from mid-February to late August, spring-bred cows gained 56 lb, whereas summer-bred cows lost 28 lb during the period in which they grazed bahiagrass-from early May to weaning in early December. As a result of these body-weight changes, spring-bred cows were 28 lb heavier than summer-bred cows when calves were weaned ($P < 0.01$).

Cow condition score paralleled cow body weight. Spring-bred cows lost more body condition while grazing range ($P < 0.01$) and were 0.3 units lower ($P < 0.01$) in condition score at the end of the range-grazing period than summer-bred cows. While grazing bahiagrass pasture, spring-bred cows gained 0.7 units of body condition score as compared to a 0.2-unit loss in body condition score for summer-bred cows ($P < 0.01$). When calves were weaned, spring-bred cows had a 0.6-unit-higher body condition score than summer-bred cows ($P < 0.01$).

Calves nursing spring-bred cows were 54 lb heavier at weaning-at 230 days of age-than calves nursing summer-bred cows ($P < 0.01$). There was no difference in the pregnancy rate of spring-bred and summer-bred cows ($P > 0.05$).

Discussion

Our results agreed with previous work (Kirk et al. 1945) which showed that midwinter was a difficult period to maintain weight and condition of brood cows grazing Florida range. Because summer-bred cows lost less weight than spring-bred cows during the range-grazing period, it would appear that grazing range later into the spring would better utilize native forage resources, improve cow pregnancy, and result in heavier calves at weaning. But in reality, the summer breeding season did not influence pregnancy rate and produced a 54 lb lighter calf at weaning.

The problem was that the higher body weight and better condition of cows when removed from range in May, as compared to February, was lost when cows nursing calves grazed bahiagrass pasture in the summers. Spring-bred cows compensated for the poor nutrition and higher weight loss that occurred during the range-grazing period. The lower quality of bahiagrass available to cows and calves in the summer-breeding-season herd was at least partially responsible for their overall poorer performance. Bahiagrass available to the spring-bred cows had limited growth in March to May but contained over 10% crude protein and 55% total digestible nutrients (TDN) (Sumner et al. 1991). By July and August, when the summer-bred cows were exposed to bulls, grass was more abundant, but the crude protein and TDN of bahiagrass pasture had decreased to 8% and 50% respectively. Toward the end of the nursing period (September-November) calves were nursing summer-bred cows, but they were less dependent on milk and more dependent upon forage for their nutrition. At this time, the crude protein and TDN of bahiagrass pasture was 7% and 45% respectively.

A second problem confronting a summer breeding season was flooding and water-logged soils caused by late-summer and early-fall rains in south Florida, such conditions negatively affect cow weight, cow condition, and calf weaning weight. In 1994, the first year of this study, the Range Cattle REC received 37 inches of rain in the August-November period. Calves in the summer-breeding-season herd were 116 lb lighter at weaning than calves in the spring-breeding-season herd. Summer-bred cows lost 105 lb of body weight while grazing bahiagrass pasture, the largest cow weight loss of any year.

In August-November 1995 and 1996, rainfall was 24 and 14 inches respectively, and calves from the summer breeding season were 11 and 30 lb lighter respectively at weaning than calves from the spring breeding season. In August-September 1997, rainfall at the Range Cattle REC was two inches below the 52-year average (Kalmbacher and Linda 1994), but five days prior to weaning the summer-breeding-season calves on November 17, seven inches of rain fell in one day. In this year, summer-bred cows lost 44 lb while on bahiagrass pasture, and their calves were 39 lb lighter at weaning than calves weaned in August from the spring-breeding treatment.

Conclusions

These data are very conclusive that a spring (March-May) breeding season is superior to a summer (May-July) breeding season for cows using a combination of native range and bahiagrass pasture. The problem with summer breeding appears to be related to the poorer nutritive value of bahiagrass forage as it matures in late summer and early fall. Additionally, wet conditions triggered by heavy late-summer and early-fall rains appear to cause significant reductions in cow body condition and calf weaning weight.

The season when range was grazed did not affect native forage species composition or yield over the four years of this study.

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