

Prescribed Burning in Giant Sacaton Bottomlands

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Giant sacaton bottoms can be found throughout southeastern Arizona at elevations from 3400 feet to over 5000 feet. They occur on floodplains, alluvial fans and stream terraces where the soils are loamy to clayey in texture, low in salts and dark colored. The annual productivity of these grasslands varies from 3000 lbs/ac (air dry) herbage production to over 6000 lbs/ac. The higher production sites usually have seasonally high water tables and/or receive extra water from flooding due to runoff from their watershed areas. Lower production sites usually have deeply incised channels and no longer flood although they may have seasonal water tables within the rooting zone of giant sacaton (20-25 feet). In nearly every stream system in our area all the variation in degree of productivity can be seen in the sacaton bottoms. Some are very wet and highly productive, some are very dry and less productive while most others are somewhere in between.

The productivity of sacaton bottoms can vary considerably from wet periods to drought periods. Oftentimes this is due to changing ground water depths. For example after many years of drought from 1989 until 2000 the water tables in sacaton bottoms in the Babacomari river drainage declined to 30 feet or more. In the very wet fall of 2000, with over 10 inches of rain and weeks of flooding in this watershed, water tables rose to the near surface and remained high for the next few years.

Giant sacaton accumulates 2-3 years of standing dead material in plants that are not burned, mowed or grazed. This old material is very coarse and poor quality forage. Periodic burning, mowing or grazing can be used to remove old growth and make new green shoots available for livestock grazing.

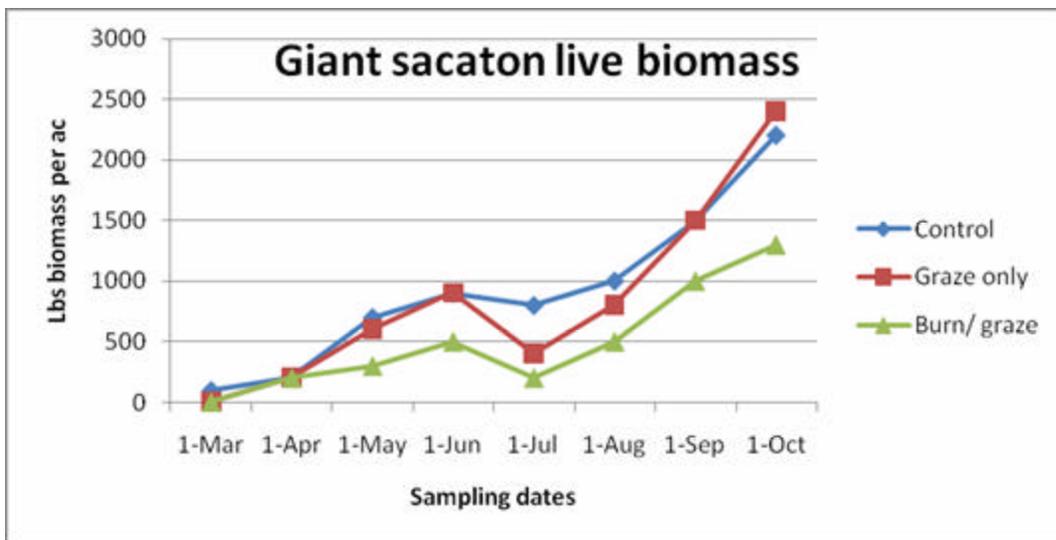
Bottomlands of giant sacaton grass burned naturally when associated grasslands burned. Fires were caused either by lightning in the summer or by Native Americans. Naturally occurring fires usually burned late in the spring or early summer and the summer rains coming in July would quickly revive the burned sacaton. Being a warm season grass most of the biomass production of

sacaton occurs in the summer. On one wet site on the Empire ranch the air dry production in the summer of 1995 (after a fire in May) was 5000 lbs/ac.

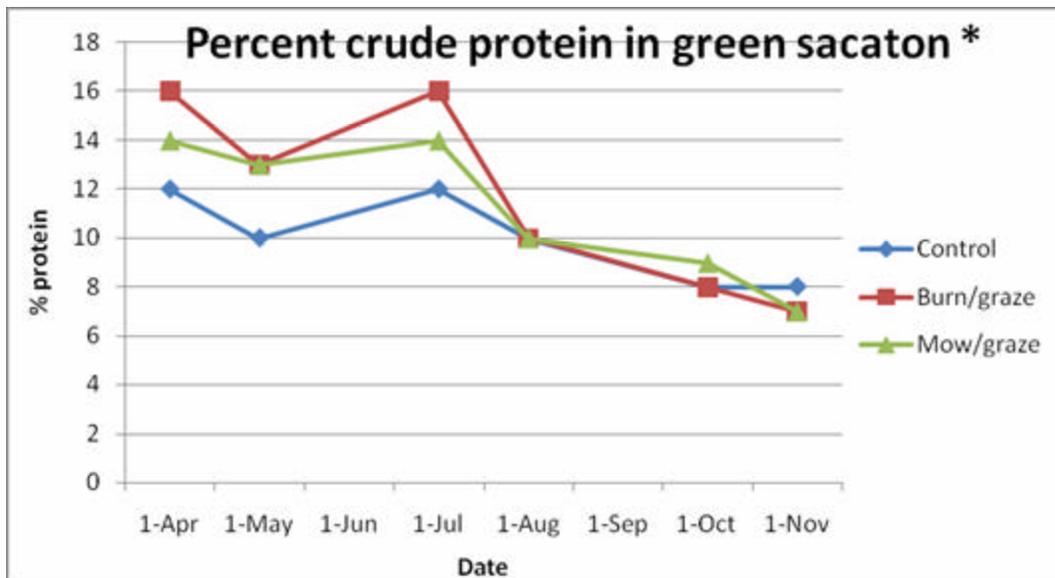
Burning has been used in giant sacaton bottoms in this region for well over 100 years. When done properly, under the right conditions, it is a safe and effective practice.

A three year study done during the early 1980s on the Empire ranch (Cox, Morton, 1986) showed that burning plus grazing can reduce the productivity of giant sacaton for up to three years following treatment.

The study was done on a medium productivity site (Empire gulch) when precipitation was below normal two out of the three study years. Annual production of live biomass averaged over the three years was 2300 lbs/ac for the control (no treatment), mowed (and grazed) and grazed only plots; while it averaged only 1300 lbs/ac for the burned (and grazed) plots. (See chart below)



Giant sacaton herbage is generally unpalatable being coarse and tough. The crude protein of dead (dry) herbage is between 3 and 6%. Crude protein levels of green herbage ranges from 8 to 12% from late spring through summer (May – Sept.). Burning can improve the levels of crude protein in the spring but the effect lasted only one season.



*Confidence intervals are not shown but indicate no significant difference in CP after 6 weeks

Daily livestock gains during two years of this study (1981, 1982) were reported for F1 Brahman x steers. Mean daily weight gain per animal was 0.90 lbs/day for control pastures and 1.47 lbs/day for burn/graze pastures. Total weight gains per pasture were 1126 lbs for the grazed only pasture and 517 lbs for the burn/grazed pasture due to reduced livestock grazing capacity of the burned pasture.

The risks associated with sacaton burns can be minimized by following a good prescription. Risks include; burning without adequate moisture for re-growth and subsequent loss of plant density and productivity, loss of soil cover and increased risk of soil sheet and gully erosion, high fuel loads increases the risk of escaped fire and possible increase in noxious weeds.

A good prescription for Prescribed burning in giant sacaton bottoms is as follows;

Recommended Frequency – No more than once every three years

Burn window – February 15 – March 15

Pre-burn moisture conditions – Should have at least 4 inches of available soil water in a five foot root zone. This can come from winter precipitation (4 inches Nov. 1 through Feb 15) or from late summer or fall flooding during the previous year.

Temperatures - Daytime 59-68 degrees F

Night-time 23-41 degrees F

Relative humidity - Between 20 and 30%

Wind speed - Less than 10 mph

Extent of burn areas – Large areas of sacaton bottoms can be treated leaving unburned strips to retain plant cover and prevent erosion in large summer floods

Recommended grazing season – May 1 through July 15

Stocking rate – variable but should average 0.5 AUM per acre for the season

References

Cox, J.R. and H.L. Morton, 1986, Big sacaton (*Sporobolus wrightii*) riparian grassland management: Annual winter burning, annual winter mowing and spring-summer grazing. *Journal of Applied Agricultural Research*, 1: 105-111.

Cox, Jerry R. 1988, Seasonal burning and mowing impacts on *Sporobolus wrightii* grasslands. *Journal of Range Management*, 41(1): 12-15.