

T H E S I S

The Botanical Effect of Pasturing upon the Native Grasses

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Introduction

The importance of the stock interest in Kansas justifies a thorough and careful study of the pasture grasses, and if possible to improve them or at least to protect what we have. It is a fact that the tame and cultivated grasses have an important place, yet in my estimation they will never replace the natural grasses, especially for resistance, and abundance of feed and on the rocky side hill or dry upland.

My observations extended over the three pasturing seasons of 1903, 1904 and 1905, each year over the same group of pastures. These groups contained several thousand acres in each, taking in as many varieties of pasture as possible, and in this respect it would be hard to excel in any other part of the state.

The largest group of pastures were the C.P. Dewey range south of Manhattan in Riley and Geary counties, though not as large there were many others in that section. The group I designated as group C. The next group I worked with was north-east of Manhattan in Pottawatomie county, group B. This contained a large variety of pastures, especially the sand. The next and last, group A, was north-west of Manhattan in Riley county, this was practically the same as the south-east, group C. I found that in many instances that the three groups especially the individual pastures in each group, that what was true of one was true of all.

Grasses

The grasses belong to the family Gramineae. The area devoted to pasture, hay and forage crops in the United States is greater than that devoted to any other single crop, the product is much greater, but this includes some of the legumes which are used for pasture hay or forage.

There are about thirty five hundred known species of true grasses divided into about three hundred genera. In the United States there are known to be about thirteen hundred and eighty species divided among one hundred sixty five genera.

The number of the best known and most valuable grasses for the different purposes, is as follows: thirty eight hay grasses, thirty five pasture grasses, fourteen lawn grasses, twenty four grasses for wet lands, twenty grasses for embankments, nineteen grasses for holding shifting sands, in many cases the grasses may occur in two or more different classes.

There are about twenty five species of grasses native to this section, but the majority of these are nonimportant only as they fill in where the other grass is gone. The following is a short description of the most abundant.

Little Blue Stem, *Andropogon scoparius*. This is probably the most abundant and important grass in all three groups. It grows to the height of from two to four feet, under favorable conditions, it comes under the head of tall grasses, and when coming from the seed, the first year is even longer. It grows quite bunchy, but when thick enough it forms a good sod.

The next in importance is the Big Blue Stem, *Andropogon furcatus*. It is about the equal of *A. Scoparius* and resembles it much also makes good hay. I found this abundantly, especially in the bottoms and on the side hills. This like the previous grass forms a compact sod, it is much taller, and coarser but makes good feed

The third of importance is *Bouteloua curtipendula* or Side Oat Grass, also *Bouteloua oligostachya* or Tall Grama is found with it, though not very plentiful only in small patches. These are both fine pasture grasses being better able to stand the highdry land, than the Blue Stems. They also cure well for winter pasture. About equal to these is the drop-seed grass, *Sporobolus Asper*. This is much like the Side Oat grass, making good pasture hay. These grasses were plentiful in all three groups.

Buffalo Grass, *Buchloe dactyloides*; was not found to any extent only in some of the pastures of group A. It is strictly an upland grass here, and propagates by seed and runners, never gets high enough to mow for hay, the height being only a few inches. It makes fine pasture, curing well on the ground thus making good winter pasture while the snow is off.

But perhaps before this some would put Kentucky Blue Grass, *Poa pratensis*. But I did not find the blue grass very extensively kept for pasture, perhaps for the reason that its place is in the bottom pastures and they are broken up. The most I found was in the ravines or timber pasture. It is one of the earliest grasses thus making the first pasture, and does well until dry weather sets in, then it dries down until the fall rains begin, reviving it and is usually kept green till frozen in the fall. It will grow about sixteen inches high under favorable conditions here, and is one of the best for the shade. When tall enough for hay it is only fair for that purpose.

There are several others of importance, though hardly to be compared with the ones named and for their use. Some of these are the Panicums, Wild timothy, *Muhlenbergia*; Wild rye, *Elymus*; Johnson grass, *Andropogon*; Halepense, Slough grass, *Spartina cynosuroides*; and Gama grass, *Tripsacern Dactyloides*, and some others, more found only in small pastures. Many of the

small weedy corner lots might at little expense be put in some of these grasses thus improving the looks if not the value of the field .

Kinds and Number of Stock

In pasturing stock there is some dispute as to which is the least injurious to the pasture, but it has been proven that it is of little importance if the pasture is rightly cared for. Though almost universally cattle are preferred to horses, goats or sheep. The last two for the reason that cattle will not eat after them at least for some time, and horses are able to eat the grass more closely than cattle, and if the pasture is heavily stocked, a dry spell is liable to kill the grass. In some cases if the pasture is not overstocked, ^{horses} will eat the tenderest grass first, this being the freshly grown. They will continue to pasture on this, leaving the older grass. In this way places are kept short and a dry spell may noticeably injure the sod.

Compared with the cattle and horses there were very few sheep and goats but there were several good sized droves of horses.

The usual price for pasture was seventy five cents per month for cattle and one dollar per month for horses.

The number of stock on a pasture varied quite noticeably as two pastures equal in ability to support stock, one contained 70 head of cattle per 160 acres while the others contained 45 head, but the first was over-pastured or overstocked. It will take a year or more of very light pasturing to restore the grass.

The number of stock per half section is as follows :

Cattle

100	Two year old	To	320	Acres
150	16 months or under	"	"	"
80 to 90	Old Cows	"	"	"

Horses

75 to 80	"	"	"
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Sheep and Goats

175 (about).....to 320 Acres

Conditions of Pastures.

It seems that the sight of a piece of unbroken prairie is something that must not be permitted to exist, as such, It is surprising to find how few natural prairie meadows are yet unbroken, that is on land capable of being cultivated. The usual rule is to over-pasture it, then claim that it is of no use as pasture any more, so its existence is soon ended as such.

The pastures considered were in all conditions from perfect to that of having no grass at all, of course, the natural result showed itself in ; that the amount or abundance of the weeds varied inversely with the amount of grass present.

The chief or most presistant error, was that of over-pasturing, for it seemed that in many cases the owner could not bear to see a little grass left in the pasture in the fall. The fact is the better the stand of grass left in the fall, that is to a limited extent, the better and the sooner will the grass start in the spring. It will stand the cold dry winter better. The weeds were less abundant in the pasture that went into the previous winter with a good coating of grass. There are several reasons for this, principally through the fact that the weed seeds in many cases are short lived and may be held in the grass past their time of germination or they may germinate and be smothered out. Many seeds may be destroyed by burning the old grass . This should not be done in most pastures oftener than once in two years, and when burnt it should be done in the spring just before the grass starts. In this way the ground is left bare only a short time, and the danger of winter killing or drying out, or if in loose soil the danger of blowing out is eliminated. If the grass is allowed to accumulate in a large quantity, burning may kill the sod ,

but burning as mentioned will prevent this. The grass if left on during the winter will retain much of the snow thus keeping the ground more moist.

The cheapest and most effective method of ridin^dg the pasture of weeds is to cut them while in blossom if possible. If they cannot be reached with the mowing machine, the scythe if properly handled will answer.

The pastures may be divided as to the following characteristics :

Wooded region

Slough and Swales

Bottom land

Stony hills

Upland

Sandy regions.

All of these characteristics were present in each group, except the sandy region. This was found in group B, Pottawatomie County .

A Few of the Principal Pasture Weeds

Scarcely any of the weeds here are difficult to get rid of if treated as advised or if the stock is lessened for a year or two the grass will regain its strength and run the weeds out. The latter is the better, the cheapest and the most all around satisfactory way of bringing a pasture back to its sod.

Probably the weed that comes the nearest to maintaining its-self against the grass is the pasture thistle, *Cnicus undulatus*, and *Cnicus Altissimus*, but there are rarely ever thick enough to interfere much with the grazing. The next of most notice is the perennial and annual rag weeds *Ambrosia*, *Artemisia* and *A. Psilostachya*, these are probably the most numerous and most difficult weeds to combat. They are especially bad where milk cows are pastured for the cows will occasionally eat them and the result is a bad taste is given to the milk.

One of the most numerous is the golden rod, *Salidage Ridiga*, This weed seeds abundantly and becomes numerous in a short time. Several of the most numerous are *Verbena Stricta*, *Vernonia Baldwinii*, Iron weed, (*Anthemis Cotula*, dog fennel) *Euphorbia Marginata* or snow on the mountain. This weed was not numerous in any of the pastures but is poisonous and should be avoided. There are many others of minor importance. The same method will answer in getting rid of these as the first ones.