3. Initial losses in herbage weights are usually the most rapid; later losses occur more gradually.

4. The period of constant weight for a community will vary in length and starting date depending upon species composition.

5. The total loss in weight for a community will depend mainly upon its species composition. If the community is largely filaree the loss (for the research worker, but perhaps not for the cow) will probably be earlier, more rapid and more complete than it will be with a community composed largely of grass.

6. These data suggest that sampling for herbage weight must be carefully coordinated with species composition and with stage of growth and so designed that normal seasonal weight losses are not confounded with forage eaten by livestock.

LITERATURE CITED


When Illinois was Range Country, City Dwellers had “Christmas Beef”, and the USDA was Born — 1862

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A hundred years ago the U. S. Department of Agriculture was created and President Lincoln appointed ISAAC NEWTON as Commis- sioner at $3000.00 per annum. An introduction to federal range literature just before 1862, and to USDA contributions in and immediately following 1862 can perhaps in small measure help to commemorate the passing of this centennial year.

There had been scattered brief mentions of range prior to 1862 in the annual volumes on Agricu- lture by the U. S. Patent Of- fice, which preceded the annual volumes published by the USDA. Thus, in 1855 CHARLES Foster of Marion County, Tennessee, wrote, for the Patent Office an- nual, about his range on the Cumberland Mountains, stating, “As a grazing region, I know of none equal to it. Indeed, thou- sands of cattle and hogs are fat- tened on the range... circumstances are such that cattle can be wintered without feed.”

In the Patent Office report of 1858 there is a two-page proposal to introduce the Tartarian yak to utilize ranges of the high plains for the benefit of the Indians. To quote: “By the introduction of the yak and its presentation to the chiefs of our Indian tribes existing on the borders of the Great Plains lying east of the Rocky Mountains, the condition of these people would certainly be ameliorated.” The suggestion followed the none too encouraging comments on climate of the area a year earlier by WILLIAM GILPIN in the 1857 volume.

He had stated, “During a tem- porary prevalence of moist at- mosphere, in the spring, the deli- cate ‘Gramma’ and ‘Buffalo’ grasses flourish, and are cured into hay upon the ground by the gradually returning drought.”

GILPIN’s description of the plains climate — “a temporary preva- lence of moist atmosphere, in spring... gradually returning to drought”—is the equal of our contemporary references to rains with only 30 percent moisture. He nonetheless added, “It is upon this... that the buffalo finds his winter food, subsisting upon it without regard to latitude; and here, also, are found vast num- bers of wild horses, the elk, the antelope, and numerous other animals peculiar to the continen t.”

In general, authors of articles for stockmen in these decades were concerned with livestock breeding and with replacing the wild (native) grasses with do- mesticated species familiar to them, or with exotic “wonder plants.” Also, much was written about the desirability and means of planting trees on the prairie.

Yet, even in the 1860 volume on agriculture of the Patent Of- fice, the REV. C. W. HOWARD of Georgia, referring to a list of Texas grasses, forwarded to him by Mr. GIDEON LINCECUM of Long Texas, wrote as follows: “The comments of this gentleman on these different grasses cannot but be read with interest by the
Southern planter. There is every reason to believe that most of these grasses originally grew throughout these States, and have been destroyed by careless grazing and culture. The Texans should be warned by this result. We are now compelled to create; they only to preserve . . . the writer has found five now growing in protected places on his farm."

Moreover, Edward Bliss writing on the Territory of Colorado in the 1861 volume, protests the concept of the "Great American Desert" and reports personally seeing herds of several hundred cattle that grazed throughout the winter. He believed Colorado to have advantages over Texas and stated that nowhere in the world was the beef finer and more tender than in the markets of Denver.

Turning now to the 1862 yearbook of agriculture, it is noteworthy that it consistently refers to St. Louis and Chicago as the West, with all references to the Northwest apparently meaning only far enough northwest to include Minnesota and Nebraska. In this first USDA yearbook is an excellent article by W. W. Corbett of Chicago. From it we learn that while some 112,745 head of cattle were received in Chicago in 1862, of these only 59,687 were slaughtered by packers and 37,223 were consumed directly within that city. Moreover, while about two-thirds of these cattle arrived by rail, almost a third were driven in. A few were transported by lake.

Mr. Corbett, in this century-old literature, states: "Many of the fancy fat cattle slaughtered in this country are from the west. The 'Christmas beef' in western cities, especially Chicago and St. Louis, is as fine as was ever exposed for sale in the most noted English markets." (The city dwellers probably found fresh beef scarce until the Christmas season when winter temperatures permitted large amounts to be kept without refrigeration.)

Concerning northern ranges of a century ago, Mr. Corbett wrote, "In the grazing region of central Illinois, and corresponding latitudes to the westward, cattle feed upon the prairie grasses and rich blue grass, that seems to come in upon all prairie land almost spontaneously, from early spring until December, generally on prairie grass from May to September, and on the tame-grass pasture the balance of the time. The great prairie ranges admit of herding in large herds with the care of but few men . . ." It deserves notice that he differentiated between tame-grass pasture and range at this early date, a practice which would clarify some of even today's writings.

Another author of this same 1862 yearbook observed that, "When the pasture fails for the ox, the sheep can get a good bite, and still thrive. Close grazing cuts the short suckers, and calls forth new ones, succulent, vigorous, and numerous, making a thick carpet of green, and better protecting the roots against drought." Fortunately, this early expert had some misgivings about his statement and continued by writing, "Too close feeding, however, may injure the pasture . . ." Another author whose topic was "Sheep Husbandry in the West" had no such misgivings and states flatly, "A good range is one of thousands of acres of high rolling prairie through which runs a never-failing 'branch,' whose banks are dotted with small groves. A better range is the same territory with the prairie grasses killed out, and blue grass in their stead.

Agricultural statistics of this year are presented in two columns headed "Loyal States" and "Disloyal States." It is reported that during the previous decade hay consuming livestock had increased 316 percent in the loyal states and 243 percent in the disloyal states, yet hay production had increased only 36 percent in the former and 48 percent in the latter. At this time corn fodder and wheat straw were beginning to replace much hay for winter feeding.

Interest in and writings about the western range, as we apply this term today, increased very rapidly in the sixties of the 1800's. The 1870 yearbook of agriculture devotes seven pages to "The Texas Cattle Trade;" including a full page etching titled "Texas Cattle" which today we would title "Longhorns." Sections are devoted to the resources of Wyoming and the Great Salt Lake Basin. But perhaps the best reading is a section entitled "The Pastoral Lands of America." Here, after quoting many testimonials, it is stated that "This testimony is conclusive upon the point of the practicability and reliability of the winter grazing of a country greater in extent than all the states east of the Mississippi River. The year 1870 is the first in which the people of the region have been able to ship beef cattle to eastern markets. The Union Pacific Railroad the past season has been shipping cattle from the Rocky Mountains to the Chicago market, a distance of over a thousand miles, for $6 to $8 per head."

Also, in this 1870 issue is what may be the first tabular data on North American range vegetation—a Species Composition estimate—in the form used by professional rangemen to this day. The anonymous USDA author deals with the region lying west of the Missouri River, between the parallels of 35° and 45° north latitude. His table is reproduced here without change.

<table>
<thead>
<tr>
<th>Species</th>
<th>Missouri River Region</th>
<th>Rocky Mountain Region</th>
<th>(Percent)</th>
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<td>Andropogon furcatus</td>
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Effects of Contour Furrowing, Grazing Intensities and Soils on Infiltration Rates, Soil Moisture and Vegetation near Fort Peck, Montana

F. A. BRANSON, R. F. MILLER AND I. S. McQUEEN

Thousands of acres of low-producing range lands in the Western United States were contour furrowed during and after the drought years of the 1930’s in an effort to improve moisture utilization. Various implements were used on a variety of soils in different climates but few reports are available on their effectiveness.

One of the earliest reports (Newport, 1937) presented observations on noticeable increases in plant growth that were attributed to increased soil moisture storage. Whitfield and Fly (1939), Dickson et al (1940), and Barnes and Nelson (1945) reported that contour furrowing resulted in significant increases in forage production on deteriorated range land. Brown and Everson (1952) observed that contour furrows in Arizona retained their effectiveness at the end of ten years and recommended studies of contour furrowing as a preparation for reseeding.

Furrows spaced at five-foot intervals significantly increased forage production in southeastern Wyoming but wider spacings were not effective (Barnes, 1952). Hubbard and Smoliak (1953) observed that furrows were of no value for holding or spreading water in Alberta, Canada, because they became filled with ice and snow.

Furrowing did not increase plant production on sandy soils in New Mexico (Valentine, 1947). Results have been extremely variable and little is known about efforts that failed, or what conditions contribute to success.

This study was designed to investigate the effects of contour furrowing on the growth of crested wheatgrass (Agropyron desertorum) and native vegetation.

Description of area
The area investigated was in the Willow Creek valley about 20 miles west of Fort Peck, Montana, on land administered by the Bureau of Land Management of the U. S. Department of Interior. Willow Creek, with a drainage area of 536 square miles, is an intermittent tributary of the Milk River. The altitude of the study site was about 2,000 feet.

The climate of the area is semi-arid with cold winters and hot summers. The mean annual precipitation at Glasgow, Montana, for the period 1900 to 1959 was 13.3 inches. About 68 percent of the precipitation fell as rain during May through September and the remainder as snow during October through April. Maximum accretions of soil moisture are from melting snow.

Portions of the area studied were contour furrowed during the winter of 1948-1949, 10 years prior to initiation of this investigation. The furrows were made with a converted disc plow capable of simultaneously making five furrows 3 feet apart. Crested wheatgrass and yellow blossom sweetclover (Melilotus officinalis) were broadcast on the treated area at three and one pound per acre rates, respectively.

The study area occupied about one-quarter section near a source of stock water and was subject to heavy use. A fenced pasture provided an area with limited grazing and an exclosure within the pasture an area with no grazing. All three grazing intensities included some of two soil types