

## NOTES AND COMMENT

### AN IMPROVED PAIR OF SHEARS FOR CLIPPING STUDIES ON QUADRATS

In 1925, two clipping studies were established on the Jornada Range Reserve; one of tobosa grass (*Hilaria mutica* (Buckl.) Benth.), and one of black grama grass (*Bouteloua eriopoda* Torr.). The tobosa clipping study is composed of nine one-meter quadrats, eight of which are used for clipping, the ninth serving as a density control. The eight clipped quadrats are organized into four groups of two, each pair having one plot clipped at two inches, and one clipped at four inches above the ground. In order to obtain data which will represent varying intensities of grazing, each pair is clipped at a different time from the other three, the intervals being: one week, two weeks, four weeks, and at the end of the growing season. The quadrats cut at intervals of one and two weeks produce only short flowerstalks between clippings. After the forage is air dry, it is weighed, and thus the production of each quadrat may be compared with the others, on the basis of grams of dry forage per square decimeter of tuft area.

The black grama clipping study is very similar to the tobosa study, except that the heights of clipping are one and two inches, while the clipping intervals are two weeks, four weeks, six weeks, and the end of the growing season.

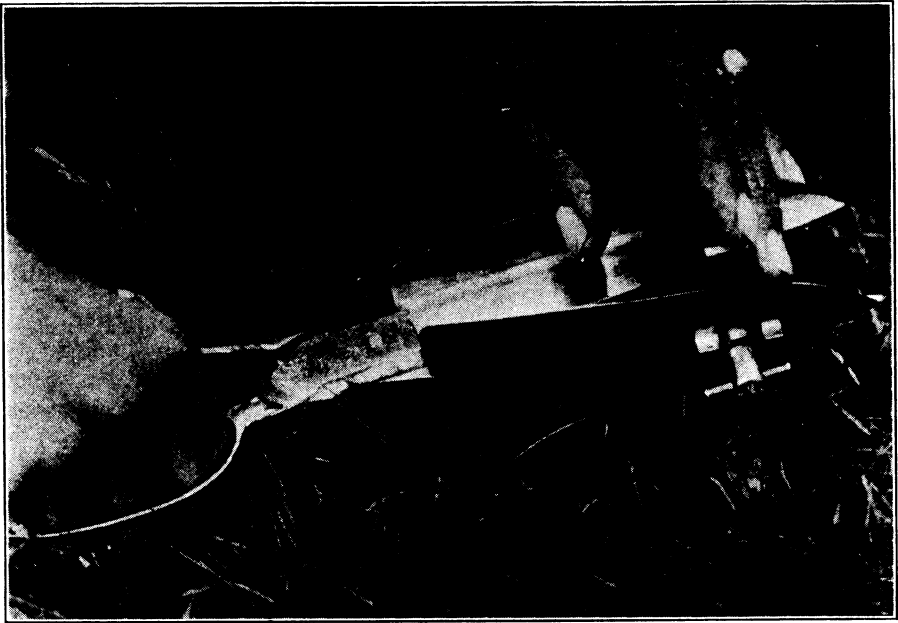


FIG. 1. The improved shears in use, showing the copper side boards and adjustable gage.

In starting the studies, the question at once arose of a proper and convenient method of clipping and saving the desired vegetation. At first, a pair of small sheep shears, and later a pair of paper shears, were used for cutting the grasses, the clipped flower-stalks

being lifted with the free hand and deposited in a paper bag. This method required constant measurement to insure the proper height of grass left on the ground. Moreover, a considerable number of short flower-stalks and leaves were lost by being flipped away when cut, or lost through the inability of the operator to hold with one hand all of the vegetation clipped.

During the field season of 1927, the improved pair of shears, shown in the accompanying photograph, was developed. This instrument, made from an ordinary pair of ten inch paper shears, removes two of the outstanding faults found in the old method. The loss of leaves and short flower-stalk tips is avoided by the presence of copper strips, an inch high, soldered onto the outer edges of the blades. Another distinct advantage of this tool is the adjustable gage set on the side of one blade, whereby the necessity of continually measuring the grass is eliminated. It will be noticed in the photograph that the gage is attached  $\frac{3}{4}$  of an inch from the point of the blade. It appears that flower-stalks in the midst of large tufts could be cut more easily if the gage were set near the fulcrum of the shears. The gage, which is graduated at one half inch intervals, is set at the desired height, and the clipping is begun. The gage is also equipped with a foot which prevents it from sinking into the ground, and may be slipped from its slot and clamped parallel to the blades for convenient carrying.

This instrument has been the means for a one third reduction in time of clipping grasses on the Jornada, and produces results which are more accurate in every way.

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#### A CONVENIENT METHOD OF BLACKENING ATMOMETERS<sup>1</sup>

In the study of plant habitats the Livingston standardized black radio-atmmeters<sup>2</sup> are very satisfactory as a measure of external conditions influencing transpiration. Unfortunately, permanently black atmmeters are not now available. The white atmmeters can be blackened in various ways without appreciably changing the standardization coefficient.

A useful method is to dip the dry atmmeter spheres in some sort of carbon ink—both India ink and Higgins' Eternal ink have given good results. In about a half hour, when the ink has penetrated and shows through as a blackish gray color on the inside, the spheres are placed in either aqua regia or concentrated sulphuric acid over night, so as to decompose any binding material that may have been used in the ink to keep the carbon finely divided and in suspension. After this treatment they are soaked in several changes of distilled water, to remove as much as possible of the acid.

Atmmeter cups treated in this way retain their black color very well when exposed to the weather. Several of them were used for observations of conditions in the mountain forest of the Philippines where they withstood drenching rains and strong insolation very well,<sup>3</sup> retaining after treatment and reasonable use, the same standardization coefficient as they had before blackening. Similarly treated spheres are now in use here at

<sup>1</sup> Contribution 356 of the Agricultural Experiment Station, Kingston, R. I.

<sup>2</sup> Livingston, B. E. "Blackened Spheres for Atmmetry." *Science*, 58: 182-183, 1923.

Livingston, B. E. and Wilson, J. D. "A Black Collodion Coating for Atmmetry Spheres." *Science*, 63: 362-363, 1926.

<sup>3</sup> See also Peralta, Fernando de, y Leaño. "A study of the relation of climatic conditions to the vegetative growth and seed production of rice." *Philippine Agriculturist*, 7: p. 169, 1919.