A Comparison of Cage and Mower Strip Methods with Grazing Results in Determining Production of Dairy Pastures

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The increasing awareness of the value of pastures in a sound agriculture has resulted in a much accelerated research program of pasture improvement during the past few years. Whereas, not many years ago pastures occupied a relatively unimportant position in agricultural research, today they have taken their place near the top. The result has been an increasing demand for reliable techniques of determining pasture production. Accurate methods of evaluating results are basic to an effective research program.

The nature and complexity of problems associated with pasture research have resulted in the development of a number of different methods, some involving livestock and others not. Probably the most commonly used system of measuring the results of pasture research is by clipping or mowing protected areas in pastures to determine yields of dry matter. The accuracy of the results obtained by present methods of mechanical clipping or mowing has been variously reported. Some results have been higher, some lower, and others about the same as those obtained from grazing animals. Ahlgren has given an excellent review of literature on methods used in evaluating results of pasture research, so no detailed review will be given in this paper. It should, however, be pointed out here that a review of the literature serves to emphasize the inadequacies of our present methods of measuring the results of pasture investigations. As pointed out by Ahlgren in his review, there is an urgent and ever growing need for additional information which will permit a more accurate evaluation of pastures in relation to each other and to other crops grown as feed for livestock.

The objective of the present investigations was to compare the cage and mower strip method of determining pasture production with one another and with results obtained from grazing.

Materials and Methods

The experimental area on which these studies were conducted consisted of six pastures having a total of 13 1/2 acres, located at the Agricultural Research Center, Beltsville, Md. This area comprised a study of renovating of old established bluegrass and orchard grass sods as the major objective, but it offered an excellent opportunity to study techniques of pasture improvement, which is the phase to be reported in this paper.

Three of the pastures, each 2 acres in size, were primarily of bluegrass initially, and the other three, each, consisted primarily of orchard grass. One orchard grass pasture was renovated in 1945 and is checked. All areas received 500 pounds of 0-14-14 fertilizer, making a total of 1,000 pounds applied over the entire 13 1/2 acres. Lime, manure, and ground limestone and 10 tons of barnyard manure were applied on the surface of the check pastures. The renovated areas were thoroughly disked and seeded to a mixture of 8 pounds of bromegrass, 8 pounds of alfalfa, and 2 pounds of Ladino clover per acre. Bromegrass and orchard grass failed to materialize, but both bromegrass and Ladino clover were obtained. There was a considerable amount of bluegrass in the orchard grass pasture during the latter part of the experiment.

All pastures were rotationally grazed throughout. On the average each pasture was grazed for a period of 10 days to 2 weeks at any one time, then rested for a period of one month. The length of rest period depended to a large extent on the rapidity of recovery, which varied considerably from pasture and time of year. Most of the pastures were grazed only a few times during the year. Milking cows were used the first year for the most part. Dry cows were also used when there were not enough milking cows available. The cows were fed according to their production and the condition of the pasture. Hay was also fed, the cows consuming non-limiting quantities on good pasture and larger quantities on poor pasture.

This comparison of the three techniques of obtaining pasture yields was made during the 3-year period, 1946-48 inclusive. The cage method involved the use of six cages, 4 feet by 4 feet by 3 feet by 30 feet with a sickle bar mower to an approximate height of 2 inches. The cages were removed from the pasture. This is about the height to which the pastures were grazed. The protected herbage was clipped with hand shears to an approximate height of 2 inches. A subsample was taken from each pasture and weighed green and dried; another subsample was removed from the pasture. This is about the height to which the pastures were grazed. The harvested material was weighed green and a subsample of approximately 2 pounds was taken. The sample was weighed green, dried, and again weighed to determine dry matter percentage of the material harvested from each pasture. This comparison of the three techniques of obtaining pasture yields was made during the 3-year period, 1946-48 inclusive.