THE EFFECT OF NITROGEN FERTILIZATION OF PERMANENT PASTURES ON SEASONAL DISTRIBUTION OF YIELDS AND ON NITROGEN RECOVERY IN THE HERBAGE

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Among the most important criteria determining the economy of applying nitrogen fertilizers to permanent pastures are the actual increases in herbage yields, the seasonal distribution of the yields, and the nitrogen recovery in the herbage. In a previous publication, the writers (12) reported the effect of nitrogen and other fertilizers on the yield and the botanical composition of pastures. It is the object of this paper to present some of the data secured in these same experiments relative to (a) the effect of nitrogen fertilizers applied in single and split application on the seasonal distribution of yields, and (b) the percentage of the nitrogen applied in the fertilizer that is recovered in the herbage.

The studies were conducted on old established pastures on three soils, a Westmoreland silt loam, a Huntington silt loam, and a Dekalb silt loam. The experimental areas were divided into a number of 0.002 acre plots, topdressed with various combinations of fertilizer and lime in quadruplicate, and clipped, usually four to six times a year, with a lawn mower. During 1930 to 1932 the mower was set to cut at a height of 1 1/2 inches, whereas during 1933 to 1936 it was set to cut at a height of 2 inches. In 1937 the plots were cut to a height of 1 1/2 inches.

The clippings were dried to a moisture content of about 1 1/2% and the yields of dry herbage and the percentage nitrogen content are both reported on this moisture basis.

EFFECT OF SINGLE AND SPLIT APPLICATIONS OF NITROGEN ON TOTAL AND SEASONAL DISTRIBUTION OF YIELDS

The area selected for studying the effect of nitrogen fertilization on seasonal distribution of yields was on one of the better upland pasture soils, a Westmoreland silt loam having a smooth topography and about 8 inches of top soil. A more complete description of this soil is given in an earlier publication (12). The fertilizer treatments and yields of herbage are shown in Table 1.

The effect of nitrogen fertilization on the yield of herbage is so closely related to the botanical composition of the pasture that the increase in yield cannot be discussed independently of the botanical

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1Cooperative investigations of the West Virginia Agricultural Experiment Station, Morgantown, W. Va., and the Division of Forage Crops and Diseases, U. S. Dept. of Agriculture. Scientific Paper No. 285 of the West Virginia Agricultural Experiment Station. Received for publication April 28, 1942.
2Associate Agronomist, U. S. Dept. of Agriculture, and former head of the Department of Agronomy and Genetics, West Virginia Agricultural Experiment Station, respectively. The preparation of this paper was completed while the writers were with the U. S. Regional Pasture Research Laboratory, State College, Pa., and the Iowa Agricultural Experiment Station, respectively.
3Figures in parenthesis refer to "Literature Cited", p. 763.