The Effect of Cutting Treatments on Birdsfoot Trefoil

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Most legumes are short-lived under grazing conditions and it is necessary to reseed them at frequent intervals in order to maintain maximum production. There is need for a productive perennial pasture legume because much of the open permanent bluegrass pasture in the United States is located on rolling or steep terrain subject to erosion. A perennial legume would tend to eliminate the erosion hazards as well as the labor and expense involved in the reestablishment of short-lived species.

Observations by Hughes (1), MacDonald (2), and others indicate that birdsfoot trefoil (Lotus corniculatus L.) often maintains a stand indefinitely after it becomes established in a permanent pasture.

Little is known about the management of birdsfoot trefoil; therefore, this investigation was designed to study the effect of cutting treatments on the yield, botanical composition, plant survival, chemical composition and root growth of birdsfoot trefoil seeded alone and in mixture with grasses.

Numerous studies with other perennial legumes and grasses have shown that both the height and frequency of cutting influence the yield, quality of forage produced, root growth and survival of the species.

Preliminary trials of (L. corniculatus L.), (L. uliginosus Schk.) and (L. tenuis L.) in Indiana, Illinois and Missouri by Pierre and Mott have shown that L. corniculatus, the broadleaf species, is superior to the others in this climatic area.

There are two recognized forms of broadleaf birdsfoot trefoil. According to Robinson (3), the erect form is widely distributed in continental Europe and the prostrate form is indigenous to England. The erect form and a late semi-prostrate form were used in this study. The erect form, imported from Italy, is referred to in this paper as the Italian strain. The semi-prostrate form is the Empire variety from New York and is referred to as the New York strain.

Materials and Methods

Four seedings, namely, Italian broadleaf birdsfoot trefoil alone, Italian broadleaf with Lincoln bromegrass (Bromus inermis Leyss.), Italian broadleaf with Kentucky bluegrass (Poa pratensis L.), and New York broadleaf birdsfoot trefoil alone, were made without a companion crop April 19, 1949. Rates of seeding were birdsfoot trefoil 5 pounds, bromegrass 6 pounds and bluegrass 4 pounds per acre. The plots were located on Flanagan silt loam, a deep, gently sloping, brown prairie soil of moderate permeability on the University of Illinois Agronomy South Farm at Urbana.

The entire area of 2 acres was grazed with yearling lambs from July 14 to Sept. 8, 1949. In order to reduce competition to the young plants, the field was mowed on June 20, July 15, and August 10 to reduce competition to the young plants, (Digitaria sanguinalis L.), green foxtail (Setaria Viridis Beauv.) and witch grass (Panicum capillare L.).

In the spring of 1950 a portion of each seeding was double-staked for cutting trials. The individual plots were 13 feet in length in 1950 and 1951, and 5 feet in length in 1952. Twelve different cutting treatments were repeated four times in each of the four seedings. The treatments consisted of cutting to a height of (1) 1 inch early August, (2) 1 inch every 3 weeks until late August, (3) 1 inch every 3 weeks until late October, (4) 1 inch every 3 weeks until late August, (5) 1 inch when 4 inches high, (6) 2 inches when 4 inches high until (7) 1 inch when 2-3 inches high until late August, (8) 1 inch when 2-3 inches high until early October, (9) 1 inch at 1/10 bloom, (10) 1 inch at 1/2 bloom, and (11) 1 inch at full bloom, and (12) 1 inch when most of the seed was ripe. Each of the plots were cut June 2-4, July 2-4, and Sept 19-21.

Yield data were obtained by mowing with the mower, raking immediately and weighing the green weight of sample of 1 to 2 pounds of matter yield calculations.

A rating of the birdsfoot trefoil stand, based on an observation of each individual plot, was made in the spring of 1951 and 1952.

An estimate of the percentage of yield which was birdsfoot trefoil, other desirable grasses and legumes, respectively, was obtained by making hand separations of the clippings in 1950, and by making a visual examination of the percentage of growth which consisted of the components on each plot before each cutting in 1951.

Samples of pure New York and Italian birdsfoot were hand separated and dried in preparation for chemical analyses.

Results and Discussion

Yield Data

The forage yields for each seadging are presented in Table 1. In order to measure the residual effects of treatments followed during 1950 and 1951, all plots were harvested three times on similar dates. The harvest date is the average yield of four replicates.