Evaluation of Kentucky Bluegrass Strains Grown in Association with White Clover

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THE value of Kentucky bluegrass (Poa pratensis L.) selections will depend in part on their compatibility with white clover (Trifolium repens L.). Myers and Garber (3) suggest that clonal plots of Kentucky bluegrass overseeded with white clover may be useful in the preliminary evaluation of individual selections. Testing bluegrass strains in association with white clover, however, adds several complications, namely: (a) the difficulty of maintaining a uniform stand of white clover, (b) the necessity of determining the contribution of the grass and legume components, and (c) the choice of management treatments, as any one treatment may favor the grass or the legume component.

The data presented here were obtained from an experiment designed to study the influence of white clover and clipping treatments on the evaluation of bluegrass strains. An abstract of these results was published by Myers and Sprague (4).

MATERIALS AND METHODS

Thirteen apomictic strains of Kentucky bluegrass representing a wide range in morphological types were selected from a group of 81 strains that had been previously studied (3). The 13 selections and two commercial lots were seeded in association with white clover in 3 × 9 foot plots. Two management treatments were used, (a) clipped to a height of ½ inch until July 1 and thereafter to a height of one inch, (b) clipped throughout the season to a height of one inch. The plots were clipped with a reel-type mower when the plants were 4 to 5 inches high. A split-plot design with four replications was used with clipping treatments as the main plots and strains as the subplots.

The bluegrass and white clover were seeded in the late summer of 1940 at rates of 25 and 3 pounds per acre, respectively, on fertile Hagerstown silty clay loam. White clover was reseeded in the spring of 1941 at the same rate. The plots were clipped uniformly in 1941 to control weeds and to encourage establishment. The first yield determinations under the differential management treatments were made in 1942. The following harvests are available for study: 1942—five harvests of the (a) treatment (½ inch, in spring) and six harvests of the (b) treatment; 1943—three harvests of the (a) treatment; 1944—three harvests (different treatments not maintained); 1945—five harvests of the (a) treatment.

The experiment was top dressed with 100 pounds of P₂O₅ and a similar quantity of K₂O on March 19, 1943. Double these amounts were applied on March 19, 1943.

Each plot was sampled before harvesting in order to determine the contribution of bluegrass, white clover, and weeds. The samples were drawn with a hand shears and the separations were made on fresh material. Sprague and Myers (5) have reported on the accuracy of this procedure.

EXPERIMENTAL RESULTS

The analyses of variance of the total and their components for the 3 years during which different clipping treatments were maintained are presented in table 1. The height of clipping had a significant effect on the yield of Kentucky bluegrass and the yield in 2 of the 3 years. In each year the bluegrass strains differed significantly with respect to total herbage yield, yield of grass, and yield of white clover. There was also a significant difference between strains in their ability to suppress weeds. The interaction between strains and management treatments was significant only for the white clover component and for the percentage of weeds in 1943. In the individual harvests the interaction of management never reached the 5% level of significance for the Kentucky bluegrass component or either of their components for the 3 years during which the two clipping treatments were maintained.

Average yields for the two cutting treatments of dry matter per acre are presented in table 1. The clipping in the spring of 1942 had a beneficial effect on the yield of bluegrass. In 1943 the difference between the two clipping heights was negligible and the 1-inch clipping treatment produced a significantly higher yield of bluegrass. As the age of stand increased, close clipping in the spring reduced the vigor and yield of grass. Differential clipping heights did not have a significant effect on either the yield of white clover.