THE EVALUATION OF INDIVIDUAL PLANTS OF PASTURE GRASSES IN ASSOCIATION WITH WHITE CLOVER

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In any plant breeding program the evaluation of individual plants is of major importance. In pasture and forage crops this problem is particularly difficult since the conditions in the space-planted breeding nursery differ so markedly from those for which the superior strains are being produced. Several workers, including Levy (4), Calder (1), Jenkin (3), and Stapledon (6), have resorted to clonal increases planted in replicated tiller rows as an aid in evaluating individual plants. In addition, Jenkin (3) and Stapledon (6) have used tiller beds in which the clonal pieces were "broadcast" in the evaluation of plants of Lolium perenne L., Dactylis glomerata L., and other grasses. Stapledon (6) stated that these plantings (tiller rows and tiller beds) were subjected to a system of pasture cuts or to a system of hay and aftermath. Calder (1) grazed the clonal rows with sheep, while Jenkin (3) neither clipped nor grazed the tiller rows in his experiments.

The tiller bed method reported by Jenkin (3) and Stapledon (6) was modified for the present study by the use of a legume (white clover) mixture. The main objective was to determine agronomic variation of the grass clones under the conditions of the experiment.

MATERIALS AND METHODS

From a space-planted nursery of about 10,000 plants of Kentucky bluegrass, Poa pratensis L., 81 plants were selected, representing a wide range of morphological types. During the winter of 1937-38, these plants were increased vegetatively in greenhouse beds, and, in the spring of 1938, they were divided into cuttings of one to three tillers each. The cuttings were rooted in soil in flats and then transplanted to the field in small plots 3 feet by 7 feet in size, the cuttings spaced 7 inches apart each way within the plot. The plots were arranged in a lattice design with four replication. Just before the bluegrass clones were planted, commercial seed of white clover were seeded uniformly over the entire area.

During the summers of 1938 and 1939, the plots were clipped periodically with a sickle bar power mower set at a height of about 1 1/2 inches and the clippings were left on the plots. In 1940, the plots were clipped seven times with a hand-driven lawn mower set at a height of 1 inch and yield samples were taken at each clipping by collecting, in a grass catcher, the clippings from an 18-inch strip through the long axis of the plot. All plots were cut on the same date when the average of the strains was 4 to 5 inches high. The samples were oven dried and all weights were recorded as grams of dry material. Estimations were made several times during the summers of 1938 and 1939 and twice in 1940 of the percentage