Comparisons of Clonal Isolations of Poa pratensis L. from Good and Poor Pastures for Vigor, Variability, and Disease Reactions

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Previous investigations concerning the improvement of Kentucky bluegrass (Poa pratensis L.) as a pasture species have dealt primarily with the comparative value of plants from seed lots collected over a wide range of conditions. It has been assumed that such collections would be representative of the genotypes occurring in the areas sampled which have generally included pastures, roadsides, fence rows, and waste places. In spite of the considerable effort that has been devoted toward the improvement of the species both here and abroad, there are few pertinent data concerning the nature of variability among plants growing in various habitats.

Breeding investigations with seed collections of Kentucky bluegrass were begun at the Wisconsin Station in 1936. Comparative analyses of progenies derived from seed have been reviewed (3).

A study of clonal samples of this species was begun during the spring of 1944. The purpose of this investigation was to obtain information regarding the effects of edaphic, topographic, and managerial influences upon the plant composition in representative bluegrass pastures of southern Wisconsin.

References concerning clonal sampling of pastures containing cultivated grasses for comparative analyses of the composition of the plant populations are infrequent. McConkey (1) reported that "indigenous plants dug from poor Kentucky bluegrass pastures are found to produce a minimum of leaves and a large number of wiry stems."

Wellhausen and Weibel (4) made clonal isolations at random in good and poor permanent pastures in West Virginia. These were tested for yield in the greenhouse and in the field, and observed for disease reactions. A great majority of the clonal isolations from poor pastures outyielded those from poor pastures. Seventy per cent of the clones from poor pastures showed a mildew reaction in the greenhouse while only 18% of those from good pastures were noticeably affected. Under field conditions susceptibility to leaf rust was much more prevalent among isolates from poor pastures.

Nissen (2) in a study of 24 better strains, 250 plants from tiller collections, and 150 seed panicle collections from 80 locations, found no significant correlations between any of the morphological characters studied and included culms per plant, culm thickness, spikelet, nodes per panicle, branches at the lowest node, and spikelets per panicle.

Materials and Methods

Approximately fifty sod cores, 6 inches in diameter, were dug at random from each of 10 pastures in southern Wisconsin in late April. The pastures represented wide variations in history and productivity. Each core was sampled by removing 10 individual tillers at random. These were space-planted in the row and 42 inches between the rows in a field of moderate fertility. Thus about 500 plants from each pasture were obtained. The pastures investigated have the following descriptions:

No. 1. Lowland pasture on rich alluvial soil subject to overflow by the Pecatonica River, near Mineral Point, Wis. The land had never been plowed or fertilized and had been moderately grazed by beef cattle for many years. The primary species were bluegrass, white clover, and redtop with several other typical lowland species present.

No. 2. Lightly grazed upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been grazed lightly by beef cattle for approximately 50 years. Due to stock frequented the area, manuring effects had been somewhat more than average. The dense turf was underlain with about 3 inches of decaying organic matter (duff) below which was a well developed topsoil of Knox silt loam. The underlying rock was of the Galena-Black River dolomite formation. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 3. Severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 4. Severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 5. Very severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 6. Severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 7. Very severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 8. Very severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 9. Very severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

No. 10. Very severe upland pasture, on the same farm as the preceding, located on hill land sloping perceptibly to the southwest. The land had been overgrazed by beef cattle for nearly 50 years. The primary species were Kentucky bluegrass and occasional small patches of quackgrass. The lower part of the areas sampled was grazed heavily by beef cattle for nearly 50 years.

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References

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