Induced Mutations in Kentucky Bluegrass

A. A. Hanson and F. V. Juska

The striking growth characteristics of Merion Kentucky bluegrass (prostrate growth habit, broad leaves, deep green color, late maturity and susceptibility to stem rust) were a distinct asset in the classification of off-type individuals and progenies. Progenies were compared with untreated controls, and those in which a majority of plants were similar with respect to changes in one or more characteristics were classed as mutants. Off-type plants in otherwise uniform progenies were classified as aberrants. Slight variations in stature were ignored because of the uncertainty in identifying environmental effects on the basis of data collected from individual spaced plants. Some variation in plant size could be attributed to soil heterogeneity and to a heavy natural epiphytotic of stem rust in both the M₁ and M₂ progenies. Results are not available from those M₁ and M₂ progenies which failed to become established satisfactorily.

RESULTS

Numbers of mutant progenies and frequency of aberrant plants recognized in the M₁ generation are summarized in Table 1. The most interesting feature of these results is the absence of recognizable mutant progenies in the control as contrasted with the rather substantial number found in the irradiation treatments. Mutant progenies included those which were uniform for changes in foliage color (from light green to yellowish green), growth habit, leaf width, and maturity. The vigor of mutant progenies appeared to be either decidedly inferior or, at best, comparable to that of the control, with the exception of one very vigorous stem rust-resistant progeny.

The frequency of aberrant plants was 8.8% in progenies derived from thermal neutron treatments or compared with 1.5% in the control. Furthermore, the percentage of aberrants was associated with treatment intensity, increasing from 3.3% in the 16-hour exposure to 7.8% in the 25-hour and 17.3% in the 32-hour exposure. Mutant and nonmutant progenies within treatments did not differ appreciably in percent aberrants. However, a total of 25 progenies were too variable to be placed in the mutant and nonmutant categories. The variability of these progenies could be attributed to either a high percentage of sexual...