Some Characteristics of Perennial and Annual Ryegrass × Tall Fescue Hybrids and of the Amphidiploid Progenies of Annual Ryegrass × Tall Fescue

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INTERGENERIC hybridization of both annual (Lolium multiflorum L.) and perennial (Lolium perenne L.) ryegrass with tall fescue (Festuca arundinacea Schreb.) is being employed at the Kentucky Agricultural Experiment Station in an effort to improve the palatability and nutritive value of tall fescue. Tall fescue is a productive pasture grass that is widely adapted to the soils and climate of the southeastern United States. It is regarded, however, as relatively low in palatability and nutritive value. On the other hand, perennial and annual ryegrasses are highly nutritious and palatable, but are essentially annual in the southeastern United States. Numerous investigators (2, 4, 8, 10) have succeeded in producing hybrids between Lolium spp. and Festuca spp. but no improved varieties have resulted.

F₁ hybrids obtained by crossing ryegrass × tall fescue were male-sterile, but some fertility resulted from backcrossing to the respective parents (4, 8). Backcrossed hybrids revert rapidly to the characteristics of the recurrent parent. Progenies obtained following the use of colchicine possibly would be more valuable in a breeding program. Several investigators have pointed out the value and potentials of artificial amphidiploids obtained by doubling the chromosome numbers of the sterile products of interspecific and intergeneric hybridization with colchicine (3, 7, 9). Carnahan and Hill (2) reported obtaining autoalloploids by treating triploid hybrids of 2n Lolium perenne × 4n Festuca elatior with colchicine.

A relatively large number of F₁ hybrids have been obtained at the Kentucky Agricultural Experiment Station by crossing both annual and perennial ryegrass with tall fescue. If fertility were induced in progenies of ryegrass × tall fescue hybrids, such materials could provide a basis for developing highly desirable forage plants with a combination of ryegrass and tall fescue characters. Some characteristics of the F₁ hybrids, an amphidiploid of annual ryegrass × tall fescue, and its progeny are reported and discussed.