

**COMPARING SOME CYTOLOGICAL AND MORPHOLOGICAL
CHARACTERS OF DIPLOID AND AUTOTETRAPLOID PERENNIAL RYE**
(Secale montanum Guss.)

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Abstract

The objectives of the study were to obtain artificial tetraploids of perennial rye (*Secale montanum* Guss.) by using colchicine, and to compare tetraploid and diploid plants with respect to some cytological and morphological characteristics.

The seeds were germinated and 2500 seedlings with 2-3 mm root length were selected. A colchicine solution (C₂₂H₂₅NO₆) of 0.1% was applied for a period of 3 hours at 30°C. they (200 control and 2500 treated seedlings) were planted to the growth flats. Control seedlings (untreated) were planted as a single row (50 seedlings) to each growth flat. After 2-2.5 months, surviving seedlings were transplanted individually to the pots and were grown under greenhouse conditions.

Tetraploid plants were obtained at a rate of 5.97 %. Aneuploid, mixoploid and chimeric plants were also observed. In diploid plants, meiotic division was generally regular whereas in tetraploid plants, meiotic division was more irregular. In tetraploids of C₀ generation, the percentages of AI with regular segregation (14:14), irregular segregation (13/15; 12/16, etc.), lagging chromosomes, and a bridge were 59.87%, 11.18%, 19.74%, 9.21% respectively. The tetraploid plants grew more vigorously than diploids. Although demonstrating a lower number of tillers and seed set percentage, tetraploid plants showed higher leaf size, spike structures and stoma length, as compared to diploids. Induced tetraploid plants may be use as breeding material for the improvement of forage rye.

Key words: *Secale montanum* Guss, autotetraploid, meiosis, morphological characters