INDUCTION AND STUDY OF TETRAPLOID *OPAQUE-2* MAIZE

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Abstract

In this paper we present the results on induction and study of tetraploid maize forms containing *opaque-2* gene which determines a high content of lysine in grain protein, in order to exploit the biochemical effect of this mutation at the tetraploid level. By applying colchicine of 0,15% concentration on plants of hybrid Chişiniovschi 307 PL at 3-4 leaf stage, tetraploid forms were obtained, characterized by vigorous stems, but shorter size and internodes, leaves with darker green hues, poorly branched panicle, but with thicker branches, especially the central one. Study of leaf epidermis revealed larger stomata but fewer per unit area. Diploid pollen of tetraploid forms was larger compared to the haploid, but the degree of fertility was lower in tetraploid forms. Analysis of the phenotypic expression of *opaque-2* mutation of maize tetraploid forms showed that this gene inherits at random chromosomal segregation in a phenotypic ratio of 35:1, which is confirmed by χ^2 test application. With ploidy level increased the amount of grain protein and fat content was reduced. Lysine content in grain protein containing *opaque-2* gene increased in proportion to the dose level in triploid and, partly, in the hexaploid endosperm.

Key words: Zea mays L., Diploids, Tetraploids, Opaque-2, Lysine.