

VARIABILITY AND GENETIC CONTROL OF PROTEINS IN POTATO HYBRID POPULATIONS

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Introduction

Potatoes contain significant levels of: carbohydrates, potassium and vitamins B₁ and B₆. Even the proteins represent 1-3% from tubers (g/100g) (1) through their digestibility, they are important polymers of amino-acid useful in healthy diet and to increase the proteins content should be considered. Selection for a higher level of proteins has been analyzed (2).

Materials and methods

Progenies (182-167 genotypes/location) of 4 combinations: C₁ (Bv.X.72-601-6 x Arka), C₂ (Fanal x Bv.X.72-602-14), C₃ (Bv.403/M x Arka) and C₄ (Isna x Alka), 7 parents and 3 standards (Ostara, Desirée, Eba) cropped 4 years in 2 locations (Braşov and M.Ciuc) were studied for the protein content variability and for its genetic control. Biuret method was used to determine the proteins and analyses of variance (ANOVA) was performed to assess the effects of genotype, year, location and their interaction.

Results and discussions

The distribution of average values of protein content was evaluated by χ^2 : $\chi^2 = 1/n_1n_2 \sum (f_1n_2 + f_2n_1)^2 / f_1 + f_2$ and all the combinations were significant different ($\alpha < 0,1\%$) for location and year. The limits of variation (mg/ml) were for C₄ (14, 2) and C₂ (19, 2) in Braşov comparing with C₄ (18, 2) and C₂ & C₃ (20, 1) in M.Ciuc. To examine whether the observed differences were caused by segregation, the percent of heterotic transgressive genotypes was assessed. For each of 4 combinations this average percentage ranged from 21% in C₃ to 50% in C₂ (4 years, 2 locations). Values in this study are consistent with other studies (3). Effects were considered random for obtaining estimates of the variance and genetic parameters (Tab.1). The heritability coefficient was small, the parents scored the higher values while the chance of phenotype to represent genotype was reduced. Environment and interaction ExG were very strong. To estimate G, E and GxE contribution into phenotypic content, synthetic groups were made (Fig.1). It has been determined the dominant contribution of E and GxE in protein content expression. Identification of superior genotypes allows selection for this character in *Solanum t.* populations and potato breeders could decide for a large number of traits in the same time.

References

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