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PROCENA STABILNOSTI SADRŽAJA ULJA U ZRNU RANOSTASNIH GENOTIPOVA SOJE

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Najvažniji parametri tehnološkog kvaliteta zrna soje su sadržaj sirovih proteina i ulja u zrnu. Prerađivačka industrija kao i individualni poljoprivredni proizvođači obraćaju posebnu pažnju na ova dva parametra, postavljajući zahteve za sortama visokog sadržaja ulja za industrijsku preradu, ili sortama visokog sadržaja proteina za dobijanje stočne hrane. Stoga je selekcionerski rad usmeren je ka stvaranju sorti ne samo visokog prinosa već i sorti poboljšanog kvaliteta zrna. Genotipovi soje koji se čuvaju u kolekciji Instituta za kukuruz Zemun Polje odlikuju se sadržajem proteina koji varira od 36.3% do 43.2%, i sadržajem ulja u rasponu od 15.6% do22.0%. Oba svojstva su kompleksne kvantitativne prirode, determinisana kako naslednim faktorima tako i uticajem uslova spoljašnje sredine u vreme njihove akumulacije u zrnu, kao i interakcijom genotipa i spoljašnje sredine.

Cilj ovog rada bio je da se ispita vrednost interakcije genotip × spoljašnja sredina za sadržaj ulja kod genotipova soje iz kolekcije Instituta za kukuruz Zemun Polje i otkriju stabilni izvori koji mogu poslužiti kao početni materijal za oplemenjivanje na sadržaj ulja.

Eksperimentom je obuhvaćeno 14 genotipova soje grupe zrenja 00 (veoma rane sorte). Ogledi su postavljeni u toku dve godine, na dve lokacije (Zemun Polje i Pančevo), po potpuno slučajnom blok dizajnu u tri ponavljanja. Nakon žetve, sadržaj ulja u semenu izmeren je na uređaju NIRT tehnologije „Infraneo“, Chopin Technologies. Za analizu interakcije genotipa i spoljašnje sredine za sadržaj ulja u zrnu primenjen je linearno-bilinearni AMMI-1 model.

Veliki deo varijacije (80,91%) interakcije genotipa i spoljašnje sredine za sadržaj ulja u zrnu ispitivanih genotipova soje objašnjen je prvom interakcijskom osom AMMI-1 modela. Razlike u glavnim efektima ispitivanih spoljašnjih sredina nisu bile velike, s obzirom da su sve sredine imale vrednost sadržaja ulja blizu opšteg proseka.

Četiri spoljašnje sredine imale su varijabilan uticaj na ispitivane genotipove. Za oba lokaliteta utvrđen je pozitivan interakcijski efekat u 2012. i negativan interakcijski efekat u 2011. godini, pri čemu su genotipovi ispitivani u Zemun Polju 2012. godine bili najnestabilniji, dok su genotipovi ispitivani u toku 2011. godine pokazali približno jednaku stabilnost na obe lokacije

Veći broj genotipova (Canatto, Kabott, Olima, Gi 291/70-79, Krajina, Agassiz, Maple Presto i Ljuso) bio je raspoređen blizu linije stabilnosti, pri čemu posebnu pažnju zaslužuju genotipovi iznad posečnog sadržaja ulja i visoke stabilnosti (Maple Presto i Ljuso) kao i genotip Agassiz, koji je imao maksimalnu prosečnu vrednost ovog parametra, i malu vrednost interakcije sa spoljašnjim sredinama. Genotipovi niskih prosečnih vrednosti sadržaja ulja (Mini Soja i Progres) imali su veoma slabu stabilnost, što se može pripisati njihovoj divergentnoj germplazmi i specifičnoj reakciji na uslove ispitivanja koji se razlikuju u odnosu na uslove regiona u kojem su ove sorte selekcionisane.

Ključne reči: soja, sadržaj ulja, AMMI-I model

ASSESSMENT OF GRAIN OIL CONTENT STABILITY IN EARLY MATURING SOYBEAN GENOTYPES

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The most important parameters of the technological quality of soybean are the protein and oil content in the grain. The processing industry, as well as individual agricultural producers, pays special attention to these two parameters, setting requirements for varieties with high oil content for industrial processing, or varieties with high protein content for animal feed. Therefore, breeding practice is aimed at developing varieties not only of high yield but also varieties of improved grain quality. Soybean genotypes maintained in the collection of the Maize Research Institute Zemun Polje are characterized by a protein content ranging from 36.3% to 43.2%, and an oil content ranging from 15.6% to 22.0%. Both traits are of a complex quantitative nature, determined both by genetic factors and the influence of environmental conditions during their accumulation in the grain, as well as the interaction of genotype and environment.

The aim of this study was to examine the value of genotype × environment interaction for oil content in soybean genotypes from the collection of Maize Research Institute Zemun Polje and to identify stable sources that can be utilized as starting material for breeding for oil content.

The experiment included 14 genotypes of soybean from maturity group 00 (very early varieties). The field trials were set up over two years, at two locations (Zemun Polje and Pancevo), according to a completely randomized block design with three replications. After harvest, the oil content in the grain was measured on a NIRT device "Infraneo", Chopin Technologies. The linear-bilinear AMMI-1 model was applied to analyze the genotype × environment interaction for grain oil content.

A large part of the variation (80.91%) of the genotype × environment interaction for the grain oil content in soybean genotypes was explained by the first interaction axis of the AMMI-1 model. The differences in the main effects of the examined environments were not large, since all environments had a value of oil content close to the general average.

Four environments had a variable influence on the examined genotypes. For both locations, a positive interaction effect was found in 2012 and a negative interaction effect in 2011, with the genotypes tested in Zemun Polje in 2012 being the most unstable, while the genotypes tested in 2011 showed approximately equal stability at both locations.

A number of genotypes (Canatto, Kabott, Olima, Gi 291 / 70-79, Krajina, Agassiz, Maple Presto and Luso) were distributed close to the stability line. Genotypes with above the average oil content and high stability (Maple Presto and Ljuso) deserved special attention, as well as the Agassiz genotype, which had the maximum average value of this parameter, and a small value of interaction with environments. Genotypes of low average values of oil content (Mini Soybeans and Progress) had very poor stability, which can be attributed to their divergent germplasm and specific response to environmental conditions that differ from the conditions in the region of their origin.

Key words: soybean, oil content, AMMI-I analysis