

## CHARACTERISTICS OF ELITE CORN LINES BY MAIN ECONOMICALLY VALUABLE CHARACTERISTICS

V.S. SOTCHENKO<sup>1</sup>, A.G. GORBACHEVA<sup>1</sup>,  
I.A. VETOSHKINA<sup>1</sup>, N.A. ORLYANSKAYA<sup>2</sup>

<sup>1</sup> FSBSI All-Russian Scientific Research Institute of Corn  
357528, Stavropol region, Pyatigorsk, 14 B Ermolov str.  
E-mail: 976067@mail.ru

<sup>2</sup> Branch of the FSBSI All-Russian Scientific Research Institute of Corn in Voronezh  
395835, Voronezh region, Khokholsky district, settl. Experimental station  
E-mail: vf-nauka@yandex.ru

*The article analyzes two-year data from the study of elite corn lines by the number of days from germination to ear flowering, sterility, stalk fragility of plants below the ear, corn smut, plant height, and the best genotypes were identified for a complex of characters. Field experiments were carried out on the experimental fields of the ARRSI of corn in the settlement Pyatigorskiy, Predgorniy district, Stavropol region. The study used 9 self-pollinated corn lines. The prevailing weather conditions in different periods of the growing season during the years of research were relatively favorable for the growth and development of plants. A comprehensive assessment of the lines was carried out using the breeding index and the real yield index. The breeding index of the variety allows to select genotypes with the optimal combination of high yield and grain harvesting moisture. The real yield index directly depends on the plants resistance to stalk fragility, which makes it possible to distinguish genotypes that optimally combine high potential yield, grain moisture and resistance to stalk fragility. It was found that the most high-yield line in both years of study was the line RGS 201. Ranking of the obtained indices also made it possible to identify the best elite lines according to a set of characteristics: RGS 201, RD 4202 SV, RG 297 and Da 27-11.*

**Keywords:** elite corn lines, average daily air temperature, harvesting moisture, grain yield, breeding index, real yield index.

### REFERENCES

1. Gorbacheva A.G., Vetoshkina I.A. *Diagnostika kholodostoykosti liniy kukuruzy* [Diagnostics of cold resistance of corn lines] // *Kukuruza i sorgo* [Corn and sorghum]. 2018. № 1. Pp. 21–26.
2. Mustyatsa S.I., Borozan P.A., Bruma S.G., Rusu G.V. *Sozdaniye, otsenka, klassifikatsiya i ispolzovaniye samoopylennykh liniy skorospeloy kukuruzy* [Creation, evaluation, classification and use of self-pollinated lines of early maturing corn] // *Materialy nauchno-prakticheskoy konferentsii «Institut rastenyevodstva «Porumben» – 40 let nauchnoy deyatel'nosti»* [Materials of scientific-practical conference “Institute of plant growing “Porumben” – 40 years of scientific activity”]. Paskani, 2014. Pp. 70–98.
3. Sotchenko V.S., Gorbacheva A.G., Bortnikova L.A., Vetoshkina I.A., Panfilova O.N., Krivosheev G.Y. *Summa effektivnykh temperatur i kolichestvo dney za period vskhody – tsveteniyechatkov u roditelskikh form gibridov kukuruzy v zavisimosti ot usloviy vyrashchivaniya* [The sum of effective temperatures and the number of days for the period germination – flowering of ear in parental forms of corn hybrids, depending on growing conditions] // *Kukuruza i sorgo* [Corn and sorghum]. 2017. № 2. Pp. 9–14.
4. Krivosheev G.Y., Gorbacheva A.G., Vetoshkina I.A. *Reaktsiya roditelskikh form gibridov kukuruzy na zasushlivyye i vlagoobespechennyye usloviya vyrashchivaniya* [Reaction of parental forms of corn hybrids to dry and moisture-provided growing conditions] // *Kukuruza i sorgo*. [Corn and sorghum]. 2013. № 4. Pp. 18–25.
5. Sotchenko V.S., Gorbacheva A.G., Vetoshkina I.A., Orlyanskiy N.A., Orlyanskaya N.A., Solomko V.I. *Sokhraneniye zhiznesposobnosti elitnykh semyan liniy kukuruzy v processe hraneniya* [Preservation of the viability of elite seeds of corn lines during storage] // *Izvestiya Kabardino-Balkarskogo nauchnogo centra RAN* [News of the Kabardino-Balkarian Scientific Center of RAS]. 2020. № 4. Pp. 65–71. DOI:10.35330/1991-6639-2020-4096-65-71.

6. Sotchenko V.S., Gorbacheva A.G., Orlyanskiy N.A., Orlyanskaya N.A., Vetoshkina I.A., Panfilova O.N., Krivosheev G.Y. *Optimizatsiya semenovodstva gibridnoy kukuruzy s ispolzovaniyem selektsionnykh indeksov* [Optimization of corn hybrid seed production using breeding indices] // *Kukuruza i sorgo* [Corn and sorghum]. 2017. № 3. Pp. 3–9.

7. Volodarskiy N.I. *Biologicheskiye osnovy vozdeleyvaniya kukuruzy* [Biological bases of corn cultivation]. M.: Kolos, 1975. 254 p.

8. Grushka J. *Monografiya o kukuruze: per. s cheshskogo M.P. Umnova* [Monograph on corn: translated from Czech by M.P. Umnov]. M.: Kolos, 1965. 723 p.

9. Tomov N. *Problema stressa kukuruzy i zadachi selektsii* [The problem of corn stress and breeding problems] // *Informatsionnyy byulleten po kukuruze «Selskokhozyaystvennyy nauchno-issledovatel'skiy institut Vengerskoy akademii nauk «Martonvashar»* [Newsletter on corn “Agricultural Research Institute of the Hungarian Academy of Sciences “Martonvashar”]. 1990. № 8. Pp. 1–29.

10. *Metodicheskiye rekomendatsii po provedeniyu polevykh opytov s kukuruzoy* [Methodical recommendations for conducting field experiments with corn] // *VNII kukuruzy VASKhNIL* [All-Russian Research Institute of Corn VASKHNIL]. Dnepropetrovsk, 1980. 54 p.

11. Sotchenko V.S., Sotchenko Y.V. *Perspektivy proizvodstva zerna i semyan kukuruzy v Severo-Kavkazskom federalnom okruge* [Prospects for the production of corn and corn seeds in the North Caucasus Federal District] // *Kukuruza i sorgo* [Corn and sorghum]. 2010. № 2. Pp. 3–6.

12. Dospikhov B.A. *Metodika polevogo opyta s osnovami statisticheskoy obrabotki rezul'tatov issledovaniy* [Methodology of field experience with the basics of statistical processing of research results]. M.: Agropromizdat, 1985. 452 p.

#### **Information about authors:**

**Sotchenko Vladimir Semenovich**, Doctor of Agricultural Sciences, Professor, Academician of the Russian Academy of Sciences, Chief Researcher of the Laboratory of Selection and Genetic Research on Corn at the All-Russian Research Institute of Corn.

357528, Stavropol region, Pyatigorsk, 14 B Ermolov str.

E-mail: 976067@mail.ru

**Gorbacheva Anna Grigorievna**, Doctor of Agricultural Sciences, Chief Researcher of the Department of Primary and Elite Corn Seed Production of the All-Russian Research Institute of Corn.

357528, Stavropol region, Pyatigorsk, 14 B Ermolov str.

E-mail: 976067@mail.ru

**Vetoshkina Irina Anatolyevna**, Senior Researcher of the Department of Primary and Elite Corn Seed Production of the All-Russian Research Institute of Corn.

357528, Stavropol region, Pyatigorsk, 14 B Ermolov str.

E-mail: 976067@mail.ru

**Orlyanskaya Natalya Alekseevna**, Candidate of Agricultural Sciences, Leading Researcher of the Voronezh branch of the All-Russian Research Institute of Corn.

395835, Voronezh region, Khokholsky district, settl. Experimental station.

E-mail: vf-nauka@yandex.ru