

Productivity and fiber quality of Bulgarian and foreign cotton varieties

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Abstract

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The Bulgarian selection of cotton has created a great diversity of varieties, which is a good prerequisite for the development of cotton production in our country. The aim of this research was to study the productive potential and to evaluate the fiber quality of Bulgarian and foreign cotton varieties. 20 Bulgarian and 11 foreign cotton varieties were included in a trial, carried out during the period 2016 – 2019, in the experimental field of Field Crops Institute in town of Chirpan, by the block method in 4 repetitions and a plot of 20 m². It was found that the seed cotton yield varied by varieties and by years. On average for four years, seed cotton yields from 1123 kg/ha to 1695 kg/ha was obtained from Bulgarian varieties and from 1290 to 1562 kg/ha of foreign varieties, which shows that some Bulgarian varieties had higher productivity. The varieties Helius, Trakia, Viki and Denitsa (Bulgarian selection) distinguished by high productivity of 1621 – 1695 kg/ha seed cotton yield exceeding the standard variety Chirpan-539 by 18.7 – 24.2%. They were also superior in fiber yield by 6.5 – 23.2%, had a high lint percentage and high setting of a 1st fruiting branch, which makes them suitable for machine harvesting, and they are very suitable for cotton production. Of the foreign varieties high productivity was found for the Greek Eva and the Spanish Tabladila-16 as in seed cotton yield they exceed the standard variety by 11.3 – 14.4%, in fiber yield – by 6.3 – 7.6%. The American Stoneville 112 and the Turkish Nazili-84 varieties had the largest bolls – 5.6 – 5.7 g and in this respect they were superior to the Bulgarian varieties. These varieties could be used as a valuable starting material in cotton breeding of productivity. The Bulgarian varieties Rumi, Natalia, Dorina, Vega, Perla and Colorit had longer fiber by 0.4-0.8 mm than the standard variety. Of the foreign varieties, Stoneville 112, Deltapine 30, Eva and C-9070 showed longer fiber by 0.5-0.7 mm than the standard. These varieties had lower productivity, with the exception of the Greek Eva and the Uzbek S-9070, and a lower fiber yield, but they are valuable for cotton breeding of fiber quality.

Keywords: cotton, *G. hirsutum* L., varieties, yield, length, lint percentage

Introduction

As a result of successful selection of cotton in our country a large range of varieties has been created (Stoilova & Valkova, 2008; Stoilova et al., 2010; Stoilova et al., 2014). The results obtained from the international variety testing of the FAO Regional Mediterranean Cotton Research Network are convincing proof that the selection of cotton in our country at the present stage is at a high level (Stoilova & Bozhinov, 2004; Stoilova & Valkova, 2005, 2010, 2012). The main breeding methods were intraspecific and interspe-

cific hybridization and experimental mutagenesis. The newer varieties Beli Iskar, Beli Lom, IPTP Veno, Boyana and Denitsa possessing high productivity and high lint percentage were obtained by intraspecific hybridization (Bozhinov & Bozhinov, 2004, 2008; Valkova & Bozhinov, 2010; Valkova, 2014a). Through experimental mutagenesis, the varieties Trakia, Helius, Philipopolis and Sirius were obtained, combining high earliness and high productivity and a number of other valuable economic qualities (Valkova, 2009, 2014 a, b). In 1994 the Avangard-264 variety was registered, by 3 mm longer fiber than that of the standard variety Beli Izvor.

This variety was obtained from the interspecific *G. hirsutum* L. × *G. barbadense* L. hybridization (Koynov & Stoilova, 1996). By combining the interspecific *G. hirsutum* L. × *G. barbadense* L. hybridization and the intraspecific *G. hirsutum* L. hybridization, the varieties Perla-267, Vega, Colorit, Darmi, Rumi, Natalia and IPK Nelina, which had improved fiber quality, were obtained (Stoilova & Saldzhiev, 2000, 2005 a,b, 2008 a,b; 2010a; Stoilova & Valkova, 2008; Stoilova & Nistor, 2012). The varieties Isabell, Egea and Nike, naturally colored brown cotton, were the result of the starting of a new selection direction for organic cotton production (Stoilova et al., 2010b; Stoilova & Dimitrova, 2017).

The aim of this research was to study the productive potential and to evaluate fibre quality of Bulgarian and foreign cotton varieties.

Material and Methods

In the study there were included the varieties: Bulgarian – Chirpan-539, Beli Iskar, IPTP Veno, Boyana, Viki, Plovdiv, Kris – obtained by intraspecific *G. hirsutum* L. hybridization, Trakia, Helius, Philipopolis, Sirius – obtained by experimental mutagenesis, Avangard-264 – created by interspecific *G. hirsutum* L. × *G. barbadense* L. hybridization, Perla-267; Darmi, IPK Nelina, Natalia and Dorina – obtained from the crossing of selection introgressive lines *G. hirsutum* L. × *G. barbadense* L. and promising varieties of *G. hirsutum* L.; foreign – Stonville 112, Deltapine 30 (American), Millennium, Eva, 791-169 (Greek), C-9070 (Uzbek), Nazily-84 (Turkish), Tabladila-16 (Spanish), T-08 (Romanian) and Siokra-1-4 (Australian). All varieties were included in one trial carried out during the period 2016 – 2019, in the experimental field of Field Crops Institute in town of Chirpan, on leached vertisol type, by the block method, in four replications and a plot of 20 m², by applying the established technology for cotton cultivation under non-irrigated conditions. To determine the varieties economic qualities, the following indicators were taken into account: seed cotton yield (kg/ha); fiber yield (kg/ha); boll weight (g); height of the first fruiting branch setting (cm) – important for mechanized harvesting; fiber length determined by the “butterfly” method (mm) and lint percentage (%). 10 plants were observed from each replication. Analyzes to determine the boll weight and fiber length were made on the fiber of the bolls located on the second fruiting branch, 1st fruiting place. Statistical processing was performed on the data from all recorded indicators (Lidanski, 1988). The ANOVA 123 program was used.

The years of the study were characterized as follows: in terms of temperature security all years of the study were warm (P = 14.3-19.4%); in terms of rainfall 2017 and 2019

were moderately wet (P = 22.6-33.3%), 2018 was wet (P = 20.9%) and 2016 was dry (P = 93.1%).

P – security coefficient determined on the basis of the order of the years in descending order, respectively by the temperature sum for May-September and the rainfall for May-August ($P\% = n/m + 1 \times 100$, where n was the order number of the testing year; m – the total number of years included in the descending order of years. The period 1989-2018 (last 30 years) was considered as the climatic norm.

Results and Discussion

Data for the seed cotton yield by years and on average for four years (2016-2019) are presented in Table 1. Variation of yields was observed by varieties and by years. In the individual years, the seed cotton yields varied from 830 kg/ha (for the variety Colorit in 2016) to 1953 kg/ha (for the variety Trakia in 2018). The highest yields of raw cotton were realized in 2017 – from 1394 kg/ha for Natalia variety to 1942 kg/ha for Viki variety. This year, the varieties Viki, Denitsa, Helius, Trakia, Boyana, Plovdiv and Sirius showed significantly higher seed cotton yields of 1734 – 1942 kg/ha than the standard variety, exceeding it by 14.6 – 28.3%. The varieties Natalia, Vega, of the foreign ones Stoneville 112, Deltapine 30, T-08 and Eva registered lower seed cotton yields than the standard variety, but the differences were statistically insignificant. The seed cotton yields were the lowest in 2016, but for some varieties they were higher than those obtained in 2017 (Kris, Beli Iskar, IPTP Veno, Stoneville 112, Deltapine 30), for others in 2018 (Darmi, Tabladila-16), or in both years (Vega, Millennium).

In 2016, eight Bulgarian varieties and five foreign varieties showed significant higher seed cotton yields of 1360 – 1564 kg/ha and 1326 – 1605 kg/ha, respectively, than the standard variety exceeding it by 25.7 – 52.1%. The most productive in this year of the Bulgarian varieties were Darmi, IPTP Veno and Vega (1534 – 1564 kg/ha), and of the foreign ones were Tabladila-16 and Eva (1566 – 1600 kg/ha). For the other varieties the differences in seed cotton yields were statistically insignificant, but the varieties Natalia, Colorit and the Greek 791-139 showed much lower productivity. In 2018, significantly higher seed cotton yields of 1683 – 1726 kg/ha than the standard variety were obtained from the varieties Trakia, Plovdiv, Denitsa and C-9070 (Uzbek), which was 27.1 – 30.4% more, and a significantly lower seed cotton yield was obtained only from the Rumi variety. In 2019, only the Trakia variety had a significant higher seed cotton yield of 1953 kg/ha than the standard exceeding it by 24.5%. This year, 8 varieties had a significant lower seed cotton yield than the standard variety, 4 Bulgarian and 4 for-

eign. Of the Bulgarian varieties these were Natalia, Dorina, Perla-267 and Colorit. The standard variety Chirpan-539 had the highest and close values for the seed cotton yield in 2017 and 2019.

On average for four years, the seed cotton yields of the Bulgarian varieties varied from 1123 kg/ha to 1695 kg/ha, and of the foreign ones – from 1290 to 1562 kg/ha. The three varieties Heliuss, Trakia and Viki showed significantly higher seed cotton yields of 1648 – 1695 kg/ha than the standard variety exceeding it by an average of 20.7 – 24.2%. Trakia variety realized significantly higher yields than the

standard in all years of study, which characterizes it as a very plastic and stable. The Heliuss variety significantly exceeded the standard variety in the first two years of the study and insignificantly in the third year, equalizing with it in the fourth year. Viki variety in 2019 had a very high seed cotton yield of 1942 kg/ha and exceeded the standard by 28.3%, exceeding it in the other 3 years by 23.5% in 2016, 18.0% and 13.6%, respectively in 2018 and 2019, but the differences were insignificant. Of the Bulgarian varieties, other five Plovdiv, Denitsa, Kris, Beli Iskar and Veno showed higher but insignificant seed cotton yield than the standard variety

Table 1. Productivity (seed cotton yield) of the varieties in 2016-2019 and average for 4 years

Varieties Years	Seed cotton yields, kg/ha				Average, kg/ha	In % to Chirpan-539
	2016	2017	2018	2019		
Heliuss	1396 ⁺	1877 ⁺⁺⁺	1526	1526	1652	121.0 ⁺
Trakia	1360 ⁺	1781 ⁺⁺	1688 ⁺⁺	1953 ⁺	1695	124.2 ⁺
Boyana	1162	1770 ⁺⁺	1535	1498	1491	109.2
Viki	1305	1942 ⁺⁺⁺	1562	1782	1648	120.7 ⁺
Filipopolis	1263	1523	1389	1563	1435	105.1
Plovdiv	1150	1735 ⁺	1683 ⁺⁺	1406	1493	109.4
Denitsa	1218	1894 ⁺⁺⁺	1726 ⁺⁺	1647	1621	118.7
Kris	1433 ⁺⁺	1568	1146	1502	1412	103.4
Sirius	1046	1734 ⁺	1272	1373	1356	99.3
Avangard-264	1013	1659	1224	1597	1373	100.5
Darmi	1564 ⁺⁺⁺	1488	1043	1313	1352	99.0
Rumi	1179	1698	954 ^o	1250	1270	93.0
Nelina	1009	1581	1346	1351	1322	96.8
Natalia	839	1394	1182	1077 ^{oo}	1123	82.3
Dorina	1111	1565	1287	1167 ^o	1283	94.0
Vega	1520 ⁺⁺	1462	1264	1240	1372	100.5
Perla-267	1431 ⁺⁺	1508	1057	1079 ^{ooo}	1269	93.0
Kolorit	830	1610	1019	1104 ^o	1141	83.6
Beli Iskar	1445 ⁺⁺	1658	1222	1504	1457	106.7
Veno	1539 ⁺⁺⁺	1595	1266	1482	1471	107.7
Stoneville 112	980	1476	1551	923 ^{ooo}	1233	90.3
Deltapine 30	1355 ⁺	1405	1338	847 ^{ooo}	1236	90.5
Millennium	1339 ⁺	1573	1201	1228	1335	97.8
791-169	867	1595	1621	1213	1324	97.0
Eva	1566 ⁺⁺⁺	1449	1508	1725	1562	114.4
T-08	1159	1489	1560	1606	1453	106.4
C-9070	1106	1633	1697 ⁺⁺	1265	1425	104.4
Nazili-84	1326 ⁺	1578	1397	1128 ^o	1357	99.4
Tabladila-16	1605 ⁺⁺⁺	1552	1555	1367	1520	111.3
Siokra-1-4	991	1510	1557	1101 ^o	1290	94.5
Chirpan-539 St	1055	1513	1324	1568	1365	100.0
GD 5.0%	276	179	317	363	266	19.5
GD 1.0%	367	239	422	483	353	25.9
GD 0.1%	477	311	548	628	456	33.4

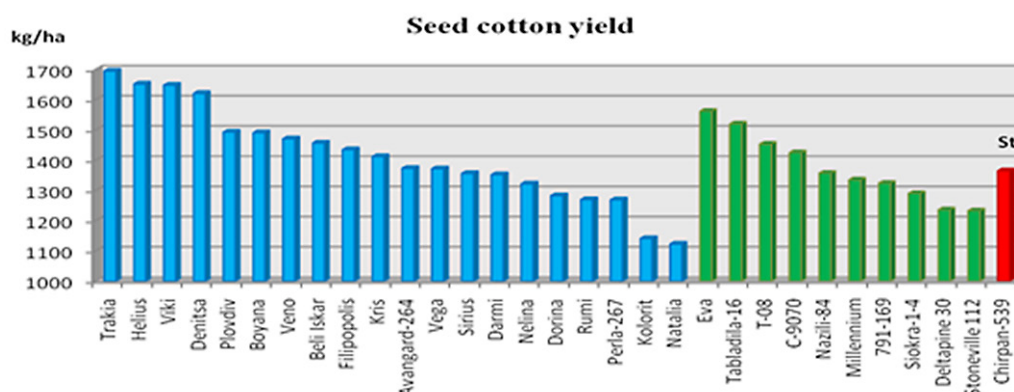


Fig. 1. Productivity (seed cotton yield) of the varieties average for 4 years

exceeding it by 6.7% to 18.7%. Plovdiv and Denitsa varieties had significant higher yields in two of the years – 2017 and 2018, Kris, Beli Iskar and Boyana varieties – in 2016. On average for 4 years, the lowest yields were obtained from the varieties Natalia and Colorit (82.3 – 83.6% of those of the standard variety), Rumi, Perla-267 and Dorina (93 – 94%). Natalia variety in terms of seed cotton yield was inferior to the standard in all years of the study, Colorit variety – in the last three years. Both varieties appeared to be lower productive than the standard variety, in terms of seed cotton yield they were significantly inferior to it in 2019. Rumi variety was significantly inferior to the standard in 2018 and insignificantly in 2019, while Perla-267 variety had insignificantly lower yield in 2018 and significantly lower yield in 2019. Dorina variety had a lower seed cotton yield than the standard only in 2019 and the difference was statistically significant.

The foreign varieties, on average for 4 years, have realized average seed cotton yields from 1290 kg/ha to 1562 kg/ha or 94.5 – 114.4% of the average yield of the standard variety. Eva and Tabladilla-16 varieties appeared to be the most productive and exceeded the standard variety by 14.4% and 11.3%, respectively. Eva variety exceeded the standard variety in seed cotton yield in 2016 (by 48.4%), 2018 (by 13.9%) and 2019 (by 10.0%). Tabladilla-16 variety surpassed it in 2016 and 2018 (by 52.1% and 17.4%, respectively) and was inferior to it in 2019 (12.8%). The varieties T-08 and C-9070, in seed cotton yield, on average for the studied period, insignificantly exceeded the standard variety by 6.4% and 4.4%, respectively.

The variety C-9070 has achieved a higher seed cotton yield than the standard variety in 2018 and insignificantly was inferior to it in 2019, while T-08 variety in this year insignificantly exceeded it. The variety Nazili-84 in seed cot-

ton yield, on average for the period, was equal to the standard variety as significantly surpassed it in 2016 and insignificantly fall behind it in 2019. The lowest seed cotton yield, on average for the period, was obtained from the Australian variety Siokra-1-4, which in 2018 insignificantly exceeded the standard variety, in 2019 was significantly inferior to it.

The analysis of the results of the four-year testing of the varieties shows that the varieties Heliuss, Trakia, Viki and Denitsa had the highest and stable yields by years and on average for the studied period (Figure 1), which outlined them as highly productive, with very good ecological plasticity and stability. From these varieties, on average for the period, a seed cotton yield of 1621 – 1695 kg/ha was obtained and significantly exceeded the standard variety Chirpan-539 by 18.7 – 24.2%. Of these varieties, the most productive was Trakia, which in all years of the study has proven to be superior to Chirpan-539 and on average for the period realized the highest seed cotton yield in the experiment. Of the other varieties, some of them slightly exceeded the standard variety, others equalized with it or gave way to it more or less. Natalia and Colorit varieties were emerging as the least productive. Some of the foreign varieties performed very well in terms of productivity. The Greek variety Eva and the Spanish Tabladilla-16 realized very good productivity and in seed cotton yield, on average for the period, exceeded the standard variety. The Romanian variety T-08 and the Uzbek S-9070 also slightly exceeded the standard variety.

Fiber yield varied by varieties from 302 kg/ha to 451 kg/ha, on average from all years of study (Table 2). The highest yield of fiber was realized by the varieties Heliuss, Trakia and Viki, which was due to their higher seed cotton yield. These varieties in terms of fiber yield of 414 – 451 kg/ha exceeded the standard variety by 15.8 – 23.2%. Of the Bulgarian varieties, higher fiber yield than the standard variety (36.6 kg/ha) was

reported for Boyana, Viki, Plovdiv (388 – 390 kg/ha), Filipopolis, Dorina, Beli Iskar and Veno (375 – 378 kg/ha), of the foreign ones for Eva, T-08 and Tabladila-16 (389 – 393 kg/ha). The other varieties in terms of fiber yield were equal to the standard variety, but in most cases they were inferior to it.

The analysis of the data shows that 10 of the Bulgarian varieties and 4 of the foreign ones had a higher fiber yield per hectare than the standard, as 3 of the Bulgarian ones had the highest values and surpass the foreign varieties, while another 3 Bulgarian ones were equal to them.

The boll weight varied from 5.0 g to 5.7 g, as the largest bolls were found for the American variety Stoneville 112. The boll weight was proven to be greater than that of the standard variety by 0.4 g. Compared to the standard variety some varieties had insignificantly larger boll weight, others had insignificantly smaller (by 0.1 – 0.3 g). Bulgarian varieties had boll weight from 5.0 g to 5.5 g, foreign from 5.3 g to 5.7 g. The American variety Stoneville 112 and the Turkish variety Nazili-84 had the largest bolls of 5.6 – 5.7 g and in this respect they were superior to the Bulgarian varieties.

Table 2. Agronomic traits and technological fiber properties of the studied varieties during the period 2016-2019 (4-years average)

Varieties	Agronomic traits			Technological fiber properties	
	Lint yield, kg/ha	Boll weight, g	Height of setting of the 1 st fruiting branch	Lint percentage, %	Fiber length, mm
Helius	433	5.3	18.2 ⁺⁺	35.8	25.9
Trakia	451	5.2	17.8 ⁺	36.3	25.7
Boyana	390	5.3	17.5	35.7	26.2
Viki	390	5.5	17.6	36.1	26.2
Filipopolis	377	5.2	18.0 ⁺⁺	35.9	25.9
Plovdiv	388	5.3	17.9 ⁺	35.5 ⁰	25.8
Denitsa	424	5.2	17.7	35.7	26.0
Kris	363	5.0	18.3 ⁺⁺⁺	35.1 ⁰⁰	26.0
Sirius	355	5.2	17.7	35.8	25.8
Avangard-264	357	5.4	18.0 ⁺⁺	35.5 ⁰	26.1
Darmi	348	5.1	18.2 ⁺⁺	35.2 ⁰⁰	26.3
Rumi	325	5.2	18.4 ⁺⁺⁺	34.9 ⁰⁰⁰	26.5 ⁺
Nelina	345	5.0	17.7	35.6	26.1
Natalia	288	5.4	18.2 ⁺⁺	35.0 ⁰⁰⁰	26.8 ⁺⁺⁺
Dorina	378	5.1	18.1 ⁺⁺	35.1 ⁰⁰	26.6 ⁺⁺
Vega	346	5.4	17.7	34.4 ⁰⁰⁰	26.5 ⁺
Perla-267	314	5.3	18.1 ⁺⁺	33.8 ⁰⁰⁰	26.5 ⁺
Colorit	302	5.4	18.1 ⁺⁺	36.1	26.6 ⁺⁺
Beli Iskar	375	5.3	17.6	35.2 ⁰⁰	26.3
Veno	378	5.3	17.9 ⁺	35.1 ⁰⁰	26.2
Stoneville 112	313	5.7 ⁺	17.5	34.7 ⁰⁰⁰	26.7 ⁺⁺
Deltapine 30	313	5.5	18.0 ⁺⁺	34.6 ⁰⁰⁰	26.5 ⁺
Millennium	361	5.2	18.2 ⁺⁺	36.9	26.4
791-169	342	5.5	17.8 ⁺	35.3 ⁰⁰	26.4
Eva	393	5.4	18.3 ⁺⁺⁺	34.4 ⁰⁰⁰	26.7 ⁺⁺
T-08	393	5.3	17.7	35.7	26.2
C-9070	371	5.4	18.0 ⁺⁺	35.5 ⁰	26.6 ⁺⁺
Nazili-84	353	5.6	17.9 ⁺	35.5 ⁰	26.4
Tabladila-16	389	5.3	18.0 ⁺⁺	35.0 ⁰⁰⁰	26.2
Siokra-1-4	325	5.3	17.7	34.4 ⁰⁰⁰	26.3
Chirpan-539 (St)	366	5.3	17.1	36.3	26.0
GD 5.0%		0.4	0.7	0.8	0.5
GD 1.0%		0.5	0.9	1.0	0.6
GD 0.1%		0.7	1.2	1.3	0.8

The lint percentage varied by varieties from 33.8% for Perla variety to 36.9% for Millennium variety. Bulgarian varieties had lint percentage of 33.8 – 36.3%, foreign ones – 34.4 – 36.9%. It can be noted that the Bulgarian and foreign varieties had a relatively equal lint percentage. The standard variety had lint percentage of 36.3%. The Trakia variety was equal to it. Viki and Colorit varieties had a relatively high lint percentage. Some varieties have been shown to be inferior to the standard variety. Of the Bulgarian varieties, with the lowest lint percentage of 33.8 – 34.9% were Perla-267, Vega, Rumi, from the foreign ones – Stoneville 112, Deltapine 30 and Eva, having lint percentage of 34.4 – 34.7%.

The fiber length varied within narrow limits – from 25.7 mm to 26.8 mm for Bulgarian varieties and from 26.2 mm to 26.7 mm for foreign ones. The standard variety Chirpan-539 had a fiber length of 26.0 mm. Of the Bulgarian varieties Rumi, Natalia, Dorina, Vega, Perla and Colorit had a longer fiber than the standard variety, which have been proven to be by 0.4-0.8 mm superior. Of the foreign varieties, longer fiber by 0.5-0.7 mm than that of the standard variety was found for the varieties Stoneville 112, Deltapine 30, Eva and C-9070. Comparing the fiber length and lint percentage shows that the varieties possessing longer fiber length had lower lint percentage.

The height of the first fruiting branch setting is of great importance for the mechanized harvesting of cotton. By varieties this indicator varied from 17.1 cm to 18.4 cm for the Bulgarian varieties and from 17.5 cm to 18.3 cm for the foreign ones. The lowest setting of the 1st fruiting branch was reported for the standard variety and all other varieties significantly and non-significantly surpassed it. The highest setting of the 1st fruiting branch was found for the varieties Rumi of the Bulgarian ones and for Eva of the foreign ones.

For the conditions of our country, with insufficient temperature sum and precipitation supply, the variety have to be early ripening, with high productive potential, fiber length not less than 26.0 mm, lint percentage over 35% and suitable for machine harvesting, resistant to diseases and enemies and to have reduced temperature requirements.

Some of the studied varieties meet these requirements. High productivity of 18.7 – 24.2% above the standard variety was found for the varieties Helius, Trakia, Viki and Denitsa. The high productivity of these varieties was combined with high setting of the 1st fruiting branch, for the Helius and Trakia varieties higher than the standard variety, and high lint percentage. Their high productivity also determined higher fiber yield per hectare.

The fiber length has been increased, 6 varieties of the Bulgarian ones, in the fiber length of 26.5 – 26.8 mm exceeded the standard variety by 0.5 – 0.8 mm. There longer

fiber however, was combined with lower lint percentage, at some varieties and with lower productivity.

The fiber length can vary greatly, due to various reasons: genetic, environmental factors such as the area of rearing, soil and agro-climatic conditions, growing technology and others. In our country, cotton is grown under dry conditions, which during the studied period were critical for the formation of greater length in the higher quality Bulgarian and foreign varieties.

The years of the studied period were warm and favored the ripening of foreign varieties, which are much later ripening than the Bulgarian ones and do not ripen in cold years. The late maturity of foreign varieties and the uncertain yield in cold years makes them unsuitable for direct use in cotton production in our country.

Conclusion

The Bulgarian varieties Helius, Trakia, Viki and Denitsa have distinguished by high productivity and in terms of seed cotton yield of 1621 – 1695 kg/ha they exceeded the standard variety Chirpan-539 by 18.7 – 24.2%. They were also superior to it in fibre yield by 6.5 – 23.2%, had high lint percentage, high 1st fruiting branch, which makes them convenient for machine picking, and are very suitable for the cotton production in our country.

Of the foreign varieties high productivity was found for the Greek Eva and the Spanish Tabladila-16, which in terms of seed cotton yield exceeded the standard variety by 11.3 – 14.4%, in fiber yield they surpassed it by 6.3 – 7.6%. The American Stoneville 112 and the Turkish Nazili-84 varieties had the largest bolls – 5.6 – 5.7 g and in this respect they were superior to the Bulgarian varieties. These foreign varieties could be used as a valuable starting material for selection of productivity.

The Bulgarian varieties Rumi, Natalia, Dorina, Vega, Perla and Colorit have distinguished by longer fiber of 0.4-0.8 mm than the standard variety. Of the foreign varieties, longer fiber by 0.5-0.7 mm than that of the standard was found for the Stoneville 112, Deltapine 30, Eva and C-9070 varieties. All these varieties were characterized by lower productivity, except the Greek Eva and the Uzbek S-9070, and lower lint percentage, but they are of great value for selection of fiber quality.

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