ОШ МАМЛЕКЕТТИК УНИВЕРСИТЕТИНИН ЖАРЧЫСЫ. АЙЫЛ ЧАРБА: АГРОНОМИЯ, ВЕТЕРИНАРИЯ ЖАНА ЗООТЕХНИЯ

ВЕСТНИК ОШСКОГО ГОСУДАРСТВЕННОГО УНИВЕРСИТЕТА. СЕЛЬСКОЕ ХОЗЯЙСТВО: АГРОНОМИЯ, ВЕТЕРИНАРИЯ И ЗООТЕХНИЯ

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ANALYSIS OF FIBER QUALITY AND MORPHOLOGICAL CHARACTERISTICS OF NEW COTTON VARIETIES IN THE CONDITION OF KHOREZM REGION

АНАЛИЗ КАЧЕСТВА ВОЛОКНА И МОРФОЛОГИЧЕСКИХ ХАРАКТЕРИСТИК НОВЫХ СОРТОВ ХЛОПЧАТНИКА В УСЛОВИЯХ ХОРЕЗМСКОЙ ОБЛАСТИ

ХОРЕЗМ ОБЛУСУНУН ШАРТЫНДА ПАХТАНЫН ЖАҢЫ СОРТТОРУНУН БУЛАСЫНЫН САПАТЫН ЖАНА МОРФОЛОГИЯЛЫК МҮНӨЗДӨМӨЛӨРҮН ТАЛДОО

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ANALYSIS OF FIBER QUALITY AND MORPHOLOGICAL CHARACTERISTICS OF NEW COTTON VARIETIES IN THE CONDITION OF KHOREZM REGION

Abstract

For all the studied characteristics, the cotton variety Qarataw was superior to the standard variety Xorazm-127, in fiber type IV, micronaire index - 4.4±0.03, specific breaking load - 32.8±0.12 gf/tex, top average length - 1.14±0.05 inches. The fiber quality indicators of 100 selected plants from the model variety Xorazm-127 and the promising Qarataw variety selected in our research were determined at the Republican "Quality" center. In recent years, special attention has been paid to the fiber micronaire index in the world market. The main range of the micronaire index for medium fiber cotton varieties should be within 3.5-4.5. If the micronaire index is higher than 4.9 or lower than 3.5, the price of the fiber will be reduced according to the established procedure. According to all technological characteristics of the fiber, the promising cotton variety Qarataw appropriates the requirements of a market economy.

Keywords: cotton, variety, fiber, length, micronaire, type

Анализ качества волокна и морфологических характеристик новых сортов хлопчатника в условиях хорезмской области

Аннотация

По всем изученным характеристикам сорт хлопка Qarataw превосходил стандартный сорт Xorazm-127 по типу волокна IV, индексу микронапряженности - 4,4±0,03, удельной разрывной нагрузке - 32,8±0,12 гф/текс, средней длине верхушки - 1,14±0,05 дюйма. Показатели качества волокна 100 отобранных растений модельного сорта Хоразм-127 и перспективного сорта Каратау, отобранных в ходе наших исследований, были определены в Республиканском центре "Качество". В последние годы на мировом рынке индексу fiber micronaire уделяется особое внимание. Основной диапазон индекса микронейра для средневолокнистых сортов хлопка должен находиться в пределах 3,5-4,5. Если индекс микронейра выше 4,9 или ниже 3,5, цена на волокно будет снижена в установленном порядке. По всем технологическим характеристикам волокна перспективный сорт хлопка Каратау соответствует требованиям рыночной экономики.

Ключевые слова: хлопок, сорт, волокно, длина, микронейр, тип

Хорезм облусунун шартында пахтанын жаңы сортторунун буласынын сапатын жана морфологиялык мүнөздөмөлөрүн талдоо

Аннотация

Бардык изилденген мүнөздөмөлөр боюнча Каратау пахта сорту була IV түрү боюнча стандарттуу Xorazm-127 сортунан, микростресс индекси - 4,4±0,03, салыштырма үзүлүүчү жүк - 32,8±0,12 гф/текс, үстүнкү орточо узундугу - 1,14±0,05 дюймдан жогору болгон. Республикалык «Сапа» борборунда биздин изил-деелерубузде тандалып алынган «Хоразм-127» улгулуу сортундагы 100 тандалма осумдуктердун жана перспективалуу Каратау сортунун буласынын сапаттык керсеткучтеру аныкталды. Акыркы жылдары була микронейр индексине дүйнөлүк рынокто өзгөчө көңүл бурулуп жатат. Орто булалуу пахта сорттору үчүн микронейре индексинин негизги диапазону 3,5-4,5 чегинде болууга тийиш. Микронейре индекси 4,9дан жогору же 3,5тен төмөн болсо, буланын баасы белгиленген тартипте төмөндөтүлөт. Талнын барлык технологиялык сипаттары жагынан перспективалы «Каратау» пахта сорты рынок экономикасынын талаптарына жооп берет.

Ачкыч сөздөр: пахта, сорт, була, узундугу, микронейра, түрү

Introduction

Each cotton variety differs from each other in terms of morphology and fiber quality. Accordingly, to date, geneticists and breeders have created cotton varieties with high indicators of some valuable economic characteristics (quick-ripening, productivity, fiber technological quality, resistance to water shortage, disease and pests). and creation continues. In order to create high-yielding, quick-ripening, high-quality fiber varieties, it is necessary to crossbreed regional and promising cotton varieties that embody the above characteristics, and to isolate genotypes with high performance from them. Among the products obtained from cotton varieties, fiber is the most valuable. Most of the economically valuable traits of cotton have a complex structure, and their complexity depends on a number of structural indicators. For example, economic indicators - cotton weight per bell, fiber yield, fiber length and several quality indicators are the main factors.

Materials and Methods:

Cotton varieties are genotypically and phenotypically very diverse, and the level of the limit (minimum and maximum range of indicators) has a very high indicator. This causes a number of problems in production and creates difficulties. As a result, farmers cannot fully satisfy their demands. The main reason for this is that the characters do not have a certain balance. Disturbance of the balance of characters leads to a sharp drop in yield and quality [1].

Fiber micronaire is an indicator of the fineness and maturity of the fiber depending on the air permeability of the cotton fiber sample. The micronaire index is currently accepted in the international market depending on the degree of ripeness and maturity of the cotton fiber, that is, it should be in the range of 3.5-4.9 in the first and second industrial grades. According to scientists [3], the micronaire index determines the ratio of micrograms per inch, which is related to the linear density of the fiber, as well as the degree of maturity of the fiber. Also, the color of the fiber, its appearance in terms of its quality after drying, the weight loss of defects and impurities (%), and the weight ratio of moisture (%) have a great impact on its price.

In recent years, special attention has been paid to the fiber micronaire index in the world market. For medium-fiber cotton varieties, the main range of the micronaire index should be within 3.5-4.5. If the micronaire index is higher than 4.9 or lower than 3.5, the price of the fiber is reduced according to the established procedure [2].

In the experiment, agrotechnical activities were carried out in a generally accepted manner in the experimental area. Mineral fertilizers were given by feeding 3 times before planting, during planting and during the growing season (the 1st feeding at the beginning of tillering, the 2nd at mass tilling, the 3rd at flowering - harvesting). The annual rate of mineral fertilizers in pure form was N-250 kg/ha, P 2O5-180 kg/ha and Po 2O-115 kg/ha. Planting was carried out in the fields in the 90x20x1 scheme in the third decade of April. Seeds are sown in the ground at a depth of 4-5 cm.

In our experiment, Xorazm-127 and Qarataw varieties of cotton were studied as sources. In the course of the experiment, important fiber quality indicators and valuable economic signs of the varieties were compared and studied. These varieties were planted in a 90x20x1 scheme with a total of 36 rows of 3 replications, 6 rows in each replication. Phenological observations were made from the day of plant germination: 50% germination; 50% bloom; 50% cotton bell opening was calculated. 100 plants of each variety were studied and methods of determining fiber quality indicators, genetic and statistical analysis were used in the HVI apparatus.

Results and Discussion

Phenological observations were carried out in comparison with Xorazm-127, which is considered as a model variety: germination and germination capacity, tillering, tillering, flowering, cotton bell opening, plant height, number of monopodial and sympodial branches and number of plants per plant. The number of cotton bell was taken into account. According to the results of observations, it was observed that, compared to the model variety, the germination of the Qarataw variety was 0.5-0.4 days earlier, the flowering was 1.8-2.1 days earlier, and the cotton bell opening was 2.9-4.5 days earlier. . It was found that the number of harvested branches is 1.4-5.2 pieces, and the number of cotton bell in one plant is 2.2-3.1 pieces (table.1).

During the vegetation period, the first field inspection was carried out when the plants were flowering, and the second field inspection was carried out during the period when the plants were in bud. Field inspections were carried out one by one in all families, and removal of plants was carried out mainly in non-specific, sparsely planted, pest- and disease-infected rows.

Results of fenological observations, 1- table

№	Fenological observation	Xorazm-127			Qarataw		
		M±m	σ	V,%	M±m	Σ	V,%
1	Germination (50%, as a day)	8,7±0,13	0,92	15,2	8,2±0,11	0,87	13,8
2	Bloom (50%, as a day)	58,2±0,17	1,08	17,4	56,4±0,14	0,97	15,7
3	Cotton bell opening (50%, as a day)	112,3±0,23	1,12	18,1	109,4±0,19	1,02	16,1
4	Plant height, sm	106,3±0,98	9,76	9,33	97,6±0,83	8,35	8,56
5	Number of harvest branches, piece	12,0±0,12	0,61	7,2	13,4±0,11	0,53	6,3
6	Number of cotton bell in one plants	17,2±0,29	1,47	22,4	19,4±0,22	1,32	20,5

Cotton weight per plant, separation of seed from fiber, fiber yield and length, cotton weight per boll and seed weight of 1000 seeds per plant under laboratory conditions of individual selection plants and families picked from the harvest of cotton cultivars compared and studied.

In laboratory conditions, the promising Qarataw variety of cotton was studied in comparison with the Xorazm-127 variety included in the State Register, and the following results were obtained in accordance with the sample variety: 0.7-1.2 g of cotton bell, yield 7.2-8.8 tons, fiber yield 3.7-5.3%, fiber length 0.5-1.4 mm and 1000 seed weight 3.4-8.3 g. it was observed that it was high (table. 2.).

The fiber quality indicators of 100 selected plants from the model variety Xorazm-127 and the promising Qarataw variety selected in our research were determined at the Republican "Quality" center. In recent years, special attention has been paid to the fiber micronaire index in the world market. The main range of the micronaire index for medium fiber cotton varieties should be within 3.5-4.5. If the micronaire index is higher than 4.9 or lower than 3.5, the price of the fiber will be reduced according to the established procedure.

Results of national characteristics, 2-table

№	Characteristics	2022 yil						2023 yil					
		Xorazm-127			Qarataw			Xorazm-127			Qarataw		
		M±m	σ	V,%	M±m	σ	V,%	M±m	σ	V,%	M±m	σ	V,%
1	Cotton weight in one cotton bell, g.	5,5±0,10	0,53	9,51	6,2±0,09	0,52	8,38	5,5±0,12	0,53	9,51	6,7±0,36	0,73	11,0
2	Productivity, ц/ga.	34,2±1,3	2,14	24,6	41,4±1,12	1,88	19,7	32,8±1,3	2,14	24,6	41,6±1,12	1,88	19,7
3	Fiber yield, %	34,4±0,23	1,27	3,70	38,1±0,23	1,26	3,36	34,1±0,23	1,27	3,70	39,4±0,62	1,23	3,12
4	Fiber lenght, mm	33,2±0,09	0,63	1,90	33,7±0,11	0,81	2,40	33,0±0,09	0,63	1,90	34,4±0,65	1,29	3,76
5	Weight of 1000 cotton bell, g.	115,2±0,16	0,84	2,01	118,6±0,1	0,76	1,89	114,7±0,16	0,84	2,01	123,0±0,1	1,05	7,92

Indicators of fiber quality (Republic “Quality” center dates), 3-table

№	Characteristics	2022 year						2023 year					
		Xorazm-127			Qarataw			Xorazm-127			Qarataw		
		M±m	σ	V,%	M±m	Σ	V,%	M±m	Σ	V,%	M±m	σ	V,%
1	Mic	4,7±0,06	0,36	7,22	4,3±0,05	0,29	6,16	4,8±0,07	0,41	7,82	4,3±0,04	0,26	5,84
2	Str	29,8±0,14	1,05	3,54	30,4±0,20	1,09	3,64	29,6±0,17	1,12	3,78	30,7±0,2	1,11	3,71
3	Len	1,09±0,05	2,55	2,34	1,14±0,05	2,70	2,41	1,09±0,05	2,83	2,42	1,14±0,05	2,63	2,39
4	Unf	84,4±0,11	0,58	0,69	84,5±0,13	0,74	0,87	84,2±0,11	0,55	0,74	84,6±0,17	0,81	0,80
5	Elg	8,2±0,08	0,42	5,11	10,0±0,17	0,94	9,41	8,3±0,12	0,47	5,23	10,1±0,16	0,88	9,22
6	SFI	4,35±0,12	0,64	14,7	4,99±0,14	0,77	15,5	4,33±0,11	0,59	14,2	5,01±0,1	0,74	15,1

It was observed that the microneural index of the Qarataw variety was lower by 0.4-0.5, respectively, compared to the standard variety. Therefore, the fiber of the Qarataw variety fully appropriate the requirements of the world market. Str-comparative breaking strength index is 0.6-1.1 gs/tex higher than Xorazm-127 grade, Len-higher average length mark is the same in both years, i.e. 0.05 inches higher than standard variety and it was observed that the Qarataw variety belongs to type IV. It was observed that the Qarataw variety was 0.2% higher than the standard variety according to the Unf - length uniformity index.

Elg (Elongation) - elongation at break the elongation at break of the fiber in the dynamometer of the HVI system is expressed in percent (%). According to this indicator, the Qarataw variety showed a 1.8% higher result than the standard variety. SFI (Short Fiber Index) – short fiber index is the length of fibers shorter than 0.5 inches (12.7 mm) in the sample, expressed as a percentage (%), and the Qarataw variety is 0.64-0, respectively, from the standard variety 0,68% showed a high result (table.3.).

Conclusion

In the conditions of the Republic of Karakalpakstan, when the Qarataw variety of cotton was compared with the Xorazm-127 variety in the small variety trial nursery, the fiber quality was superior to the variety, the fiber length was 33.9±0.17mm, the microneur index 4.4±0.03 ni, specific tensile strength 32.8±0.12 gs/tex, peak and average length 1.14±0.05 inches and fiber type IV characteristics were found. It shows that the promising Qarataw cotton fiber fully appropriate the requirements of the world market in terms of all technological features.

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