European Journal of Agricultural and Rural Education (EJARE)
Available Online at: https://www.scholarzest.com
Vol. 3 No. 11, November 2022
ISSN: 2660-5643

DEFOLIANTS AND THEIR EFFECT ON THE QUALITY OF FIBER

Buriyeva S.Z. - Independent Researcher
Karshi engineering-economics institute, Karshi

Article history:

Received: 10th September 2022
Accepted: 10th October 2022
Published: 17th November 2022

Abstract:

Different rates of defoliants Baystar SC and FanDEF applied to medium fiber cotton varieties had different effects on cotton fiber. The lowest dose of drugs had a positive effect on fiber strength, while the highest dose had a negative effect on this indicator.

Keywords: Defoliants, standards, fiber quality indicators, fiber yarn spinability, fiber ripening, fiber staple length, micron, fiber length uniformity coefficient, fiber strength, elongation at break, elasticity.

INTRODUCTION. In growing the cotton crop, is not only intended to get a high yield from it, but special attention is also paid to the quality indicators of the crop. The reason is that the quality of the fiber is important for the future quality of the fabric made from the yarn.

The agrotechnical activities carried out in the care of the cotton crop to obtain a higher and quality harvest, that is, the activities carried out from plowing the land to harvesting the crop: chemical treatment of seeds against diseases and pests, fertilization, treatment with biostimulants, exposure to external factors (heat, heat and use of various anti-stressors, use of chemical preparations against weeds, carrying out defoliation activities have both positive and negative effects on plant development.

Therefore, it is appropriate to thoroughly study the effects of each agro-event, especially if chemical preparations are used in these agro-events.

In order to obtain a high and high-quality harvest from the cotton crop, especially in order to obtain an early harvest without delaying the late autumn rains, based on the types and biological characteristics of the varieties, after a certain part of the crop (45-50 or 65-70%) is opened, the standards of defoliants approved in scientific tests should be used to obtain an early and high-quality harvest. provides.

The effectiveness of defoliants depends on the environmental temperature, soil moisture, the condition of the plant, and the chemical properties of defoliants. Therefore, in order to get early, high and quality harvest from the cotton crop, it is necessary to pay special attention to the factors mentioned above and to study their compatibility with each other and their effect on the quality of the crop.

In the scientific research conducted in this regard, it was observed that the optimal spraying period of the drug Auguron extra from the defoliants that have a mild effect on the cotton plant is when the daily temperature is 20-22 C [1]. At the same time, when these defoliants are applied to the cotton crop, it increases not only its artificial leaf fall, but also the opening of bolls by 12-15%. It also kills 100 sucking insects that breed in cool autumn weather. This prevents these harmful insects from overwintering in large numbers.

Application of chlorate-containing defoliants to cotton resulted in 86-87% reduction in leaf drop, 88-89% boll opening, and 100% death of plant-sucking insects 14 days after application of the defoliant [2].

In the 20th century, the Cotton Farming Handbook published in 1989 [3] and the Cotton Farming Handbook published in 2016 [4] also provide detailed information about the defoliation event and the properties of defoliant preparations for early, abundant and high-quality harvesting of the cotton crop.

PLACE AND RESEARCHCONDUCTINGMETHOD. In 2020-2021, the research was conducted in the production field of the Kashkadarya scientific-experimental station of the Scientific Research Institute of Cotton Selection, Seeding and Cultivation in the territory of A.Navoi, Kasbi District, Kashkadarya Region. In this case, three different rates of two different defoliants (Baystar SC, FanDEF) (Baystar SC defoliant 0.5-0.6-0.7 l/ha and FanDEF defoliant 5-6-7 l/ha) to average daily temperatures (average daily temperature 25-30 °C; 22-25 °C; 20-20 °C; 17-20 °C) were tested to determine the effectiveness. Each option was 3.6 meters wide, 15 meters long, and had an area of 54 m². Variants were placed in three rows in three rows in the randomization method, and phenological observations were made on plants with paper labels.

Placement of the experiment, conducting field observations, and conducting laboratory analyzes are generally accepted "Methodology of experiments conducted in the field of cotton growing in the field and in the laboratory under irrigated conditions" (1962) [5], "Methodology of field experiments with cotton" (1981) [6], "Genetics. Selektsiya i semenovodstvo khlopchatnika" (1987) [7], "Methods of conducting field experiments" (2007) [8] were conducted based on methodological methods.

The research area belongs to the place where the climate of the Karshi desert is sharply changing continental and, at the same time, has hot summers and rather cold winters. In winter, cold air currents from the northern Arctic come in and lower the temperature considerably. In January, the average air temperature can drop from 0°C to +2°C, and in winter sometimes from -15°C to -25°C. Summer is hot and dry and lasts long. In July, the daytime temperature sometimes rises from +44°C to +47°C.

The average annual air temperature is always higher than +15°C. During the year, there are 242 hot days. The sum of useful temperatures is maintained at 4533-4939 degrees in a year.

The sum of useful temperatures for plants is 2330-2991°C, which is very convenient for growing thin-fiber cotton and planting heat-loving crops in the Karshi desert, as well as for obtaining two or three harvests from the same area in a year (L.N. Babushkin) [9].

RESEARCH RESULTS AND DISCUSSION. From each version of the experiment and from all returns, 100 bolls of cotton were collected and laboratory analysis was carried out on them. At the same time, the fiber of the samples was analyzed in the HVI unit. Table 1 summarizes the results of this analysis.

Table-1.

Effect of defoliants and their different standards on fiber quality (2020-2021 average)

Variants	SCI Grade	Mic	Mat (mat1)	UHML (in)	UI (%)	SF (%)	Str (g/tex)	Elg (%)	Rd	+ b
Control	146	4,81	0,87	1,186	82,6	7,6	34,4	6,8	82,3	7,6
BaystarSC-0.5 l/ha	154	4,90	0,88	1,224	84,6	6,5	33,2	7,0	82,7	7,9
BaystarSC-0.6 l/ha	145	4,85	0,87	1,226	83,4	6,7	32,4	7,1	81,2	7,6
BaystarSC-0.7 l/ha	148	4,83	0,87	1,211	83,7	6,8	32,4	6,9	83,2	7,9
FanDEF-5 l/ha	148	4,88	0,87	1,215	83,7	6,9	32,8	7,3	82,0	7,7
FanDEF-6 l/ha	143	4,88	0,87	1,213	83,1	7,3	32,1	7,3	82,2	7,6
FanDEF-7 l/ha	150	4,88	0,87	1,224	84,5	6,6	32,1	7,4	82,2	7,6
In relation to the yarn twist coefficient		0,45	0,77	0,35	0,84	-0,67	0,14	-0,08	0,45	0,66
In relation to the micronaire index			0,53	0,74	0,71	-0,57	-0,48	0,70	-0,08	0,15
In relation to the coefficient of ripeness				0,32	0,58	-0,46	0,23	-0,22	0,32	0,62
Compared to the above average length					0,76	-0,89	-0,75	0,59	-0,26	0,18
In relation to the index of homogeneity in length						-0,90	-0,41	0,37	0,25	0,49
In relation to the index of short fibers							0,52	-0,30	-0,02	-0,47
Relative to breaking strength								-0,71	0,12	0,03
With respect to elongation at break									-0,39	-0,42
In relation to the reflection coefficient										-0,75

Analysis of table data showed that defoliants and their application rates had different effects on fiber quality. Spinning consistency index (SCI) of cotton fiber is determined by length and modulus of fiber. 150 units of this is the upper range and 120 units is the lower range. Table data show that fiber threadability under the influence of defoliants compared to the control option (no defoliant was sprayed) (146) at the lowest (0.5-5.0 l/ha) and the highest (0.7-7.0 l/ha) rates when the defoliant was applied. the score was 148-154. That is, under the influence of defoliants, the fiber had a high and very high yarn spin index. Moderate use of defoliants resulted in a decrease in yarn spin coefficient compared to the control variant (145-143).

The fineness and ripeness of the fiber is determined by the Micronaire (Mic) indicator. Analytical data showed fiber roughening due to defoliants.

The maturity coefficient (Maturity (Mat)) is determined according to the cross section, which is determined by the length and maturity modulus of the fiber and the microneural modulus. Here, 0.80 is the lowest and 1.00 is the highest. There was no significant difference in this indicator under the influence of types of defoliants and their rates.

The Upper Half Mean Length (UHML) is the average length of the longest fibers that make up half of the mass of the sample being tested, expressed in inches or mm. In this regard, the variety of defoliants and their application rates have provided an improvement of 0.025 to 0.040 inches, or a staple length of 38 mm to 39 mm.

Uniformity Index (Unf) of fiber raw material is defined as the ratio of its average length to the upper average length, expressed as a percentage. The higher this percentage, the higher the quality of the yarn. Depending on the defoliants and their standards, the homogeneity index was improved by 0.5 and 2.0 % compared to the control

variant. Probably due to the fact that the effects of the two types of defoliants used were different, it was found that increasing the rate of application of Baystar SC had a negative effect on the uniformity indicator, while increasing the rate of FanDEF had a positive effect on this indicator.

The Short Fiber Index (SFI) is the percentage of fibers in a sample that are shorter than 0.5 inches (12.7 mm) in length, expressed as a percentage. The range is between 2% and 20%. The results of the analysis showed that defoliants and their application rates positively affect this indicator of fiber, and it improved from 0.3% to 1.1%, depending on the type and rates of defoliants.

Relative breaking strength (Strength (Str)) refers to the hardness of the cotton fiber. The larger this indicator is, the more mature the fiber is. Defoliants and their standards have shown to have an adverse effect on fiber toughness. At the same time, it was found that increasing the rate of defoliant has the opposite effect on its ripeness.

Elongation of the fiber at break or its elasticity (Elongation (Elg)) refers to the elongation of the fiber expressed in percentages in the dynamometer of the instrumental system. The data obtained in this regard showed that the type of defoliants and their levels had a positive effect on the elasticity of the fiber. That is, elasticity improved by 0.2-0.6% compared to the control option.

According to the analysis of the research samples, no regularity was observed in the fiber reflection coefficient (Reflectance (Rd)), that is, the amount of light reflected from the surface of the cotton fiber sample, and the level of yellowness (Yellowness (+b)).

CONCLUSIONS

1. Defoliants have different effects on fiber quality indicators depending on their properties and application rates. That is, if it has a positive effect on some indicators of the fiber, it will have a negative effect on some of its characteristics.
2. The analysis of these quality indicators requires that the effect of defoliants on fiber quality should also be taken into account when determining effective rates and durations of defoliants.

LIST OF USED LITERATURE

1. Mirzaolimov A.N., Main types and descriptions of cotton defoliants, Oriental Renaissance; Innovative, educational, natural and social sciences, Volume 2, May 2022, 251-259
2. Adilov Z., Ergashev D., Tozhiev R., Khamdamov Sh., Poluchenie chloratsoderjashchix defoliantov, obladyushchix insectitsidnymi svoystvami / Monografiya/ Fergana-Vinnitsa "Evropeyskaya nauchnaya platforma" 2021 year, 132 p.
3. Cotton magazine, "Mehnat", Tashkent, 1989
4. Cotton reference book, Science and Technology, Tashkent, 2016
5. Methodology of field and laboratory experiments in irrigated cotton cultivation, Tashkent, 1962.
6. Method of field experiments with cotton, UzPITI Tashkent, 1981.
7. Simongulyan N.G., Muhammedkhanov S.R., Shafrin A.N. -Genetics. Selektsiya i semenovodstvo xlopchatnika, "Mekhnat", Tashkent, 1987.
8. "Methods of conducting field experiments" Tashkent, 2007.
9. Babushkin L.N. The nature of Kashkadarya region. Own Dav. Edition. S.D.U. , volume 1, Tashkent-1959.