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EFFECT OF NEW DEFOLIANTS ON SEED OIL CONTENT IN VARIOUS COTTON VARIETIES

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Abstract. The article describes the effect of new defoliants on seed oil content in cotton varieties S-4727 and Mangit-1. The results of the study showed that the application of defoliants at optimal rates does not negatively affect the quality indicators of the seeds and serves to preserve their technological value. The rational use of new defoliants is essential for increasing the efficiency of defoliation.

Key words: cotton, defoliation, defoliant, S-4727, Mangit-1, MicroDEF, NitroDEF, seeds, oil content, core yield.

Introduction

In cotton growing, the use of modern agricultural technologies is of great importance for obtaining high and high-quality yields. One such agrotechnical measure is defoliation, which serves to accelerate the ripening of the harvest through the artificial shedding of cotton leaves and to increase the efficiency of cotton harvesting, especially machine harvesting.

Cotton seeds are of great importance not only as seed material but also as valuable raw materials for industry. The oil content in the seeds is considered one of its primary quality indicators. Oil accumulation depends on the varietal characteristics of the cotton, the level of nutrition, environmental factors, and the agrotechnical measures applied during the growing season.

Physiological and biochemical changes occurring in the plant during defoliation can affect seed formation and the accumulation of reserve substances, including oil. Therefore, determining the effect of defoliants on seed oil content in various cotton varieties is of great scientific and practical importance.

According to A.M. Grodzinski, changes in physiological processes in plants influence the formation of seeds and the accumulation of reserve substances in them [1]. In this regard, the study of the influence of new preparations used in the defoliation process on seed quality is one of the most pressing issues.

Research method.

The studies were conducted on cotton varieties S-4727 and Mangit-1. The experiment consisted of 16 variants, with each variant being placed in 3 repetitions. In the experiment, Liquid-HMD was used as a standard at a rate of 8.0 l/ha, and MicroDEF and



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NitroDEF were used as new defoliant at rates of 6.0; 7.0 and 8.0 l/ha were used. In the control variant, no defoliant was applied.

At the end of the study, the oil content in the seed kernel, the total oil content in the seed, and the kernel yield were determined. The results obtained were compared with the control variant, and the effect of defoliant at various doses was evaluated.

All data obtained during the experiments were conducted in accordance with the methodological guidelines "Methods for Conducting Field Experiments" (2007), "Methodological Guidelines for State Testing of Cotton Defoliant" (1995), and "Methods for Determining Cotton-Fiber Properties" (1972). Assessment of the reliability of the obtained results and mathematical-statistical analysis were carried out based on the methodology of B.A. Dospekhov "Methodology of Field Experiment" (1979).

Research results and their analysis.

According to the research results, in the control variant of the S-4727 cotton variety, the oil content in the kernel was 38.22%, the oil content in the seeds was 17.37%, and the kernel yield was 54.2%. In the variant using the LiquidXMD defoliant at a rate of 8.0 l/ha as a standard, these indicators were 38.60; 17.73 and 54.7%, respectively.

Among the new defoliant, MicroDEF demonstrated high efficiency. At a rate of 6.0 l/ha, the oil content in the kernel was 38.90%, the oil content in the seeds was 17.80%, and the kernel yield was 54.8%. When applying this defoliant at a rate of 7.0 l/ha, the highest results were recorded, with these indicators reaching 39.42; 17.87 and 54.9%, respectively.

In the variant with the application of NitroDEF defoliant at a rate of 6.0 l/ha, the oil content in the kernel was 38.85 percent, the oil content in the seeds was 17.75 percent, and the kernel yield was 54.2 percent; at a rate of 7.0 l/ha, these indicators were 39.35; 17.82 and 54.3%, respectively. Also, at a rate of 8.0 l/ha, a slight decrease was observed, reaching 38.80; 17.70 and 54.1 percent, respectively.

In the control variant of the Mangit-1 cotton variety, the oil content in the kernel was 36.35%, the oil content in the seeds was 16.85%, and the kernel yield was 53.0%. In this variety, oil content indicators did not change sharply when using Liquid-HMD.

At a defoliant rate of 6.0 l/ha, the oil content in the kernel was 36.42%, the oil content in the seeds was 16.90%, and the kernel yield was 53.4%, whereas at a defoliant rate of 7.0 l/ha, these indicators were 36.56; 17.05 and 53.7 percent, respectively.

In the variant using the NitroDEF defoliant at a rate of 7.0 l/ha for the Mangit-1 cotton variety, the oil content in the kernel was 36.41%, the oil content in the seeds was 17.01%, and the kernel yield was 53.4% (Fig. 1).



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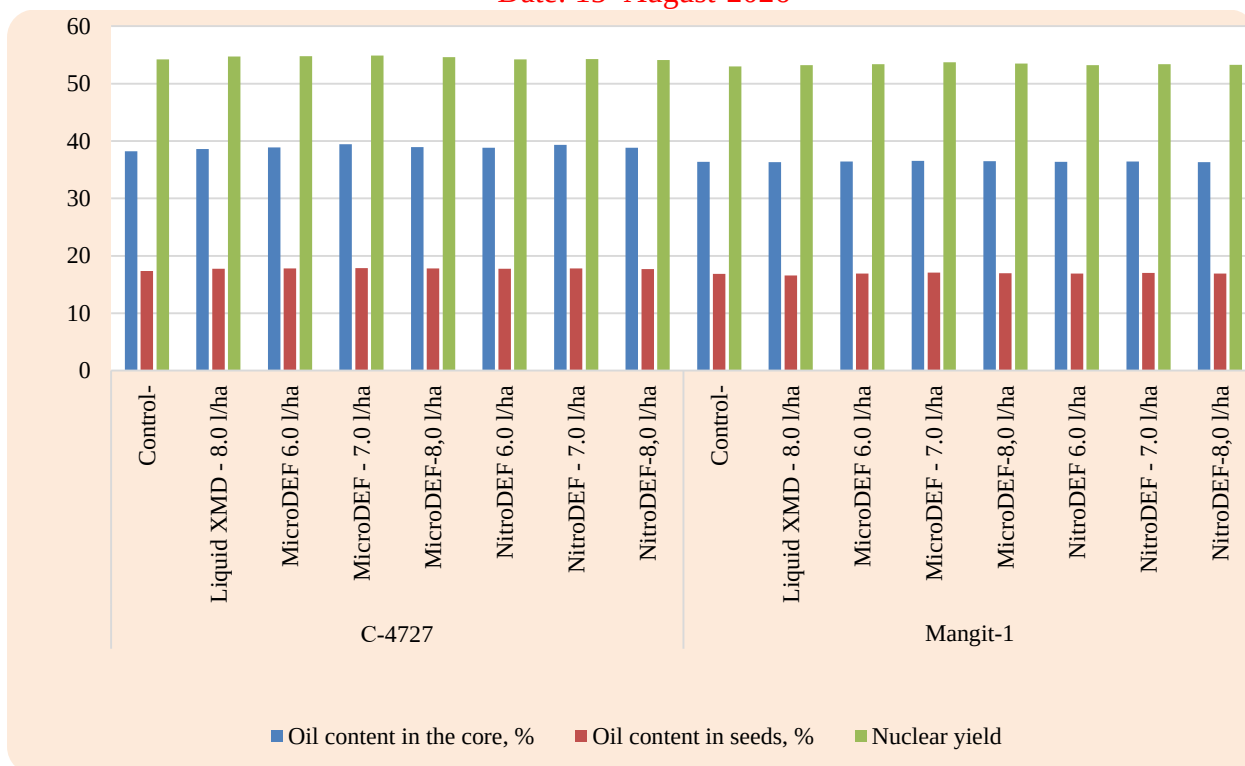


Figure 1. Effect of new defoliant on seed oil content in various cotton varieties, %

The results obtained showed that the biological characteristics of the cotton variety are an important factor in the formation of seed oil content. The oil content in the seeds of the S-4727 variety was higher than that of the Mangit-1 variety.

At the same time, relatively high results were recorded for both varieties at a defoliant rate of 7.0 l/ha. In particular, the highest result was achieved by the S-4727 variety at the MicroDEF application rate of 7.0 l/ha. Increasing the rate to 8.0 l/ha was accompanied by a slight decrease in oil content and kernel yield.

This circumstance indicates that increasing the dosage of defoliants does not always yield a positive result. Therefore, it is advisable to determine the defoliant dosage taking into account the biological characteristics of the cotton variety and the agro-climatic conditions of the region.

Conclusion. As a result of studies conducted on cotton varieties S-4727 and Mangit-1, it was established that the application of new defoliants at optimal rates does not negatively affect seed oil indicators.

Overall, the research results showed that the application of MicroDEF and NitroDEF defoliants at a rate of 7.0 l/ha can be evaluated as a promising agrotechnological solution for preserving seed oil content and kernel yield across various cotton varieties.

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