



ANALYSIS OF THE INDICATORS OF THE “GERMINATION TO 50% MATURITY” PERIOD OF F₁- F₂ COTTON COMBINATIONS

Jo‘raev Sirojiddin Turdiqulovich

D.Biol.Sc., Professor, Tashkent State Agrarian University

juraev.197817@mail.ru

Olimova Zulxumorxon Qaxramonjon qizi

Researcher

Boyliyev Ma‘ruf Olim o‘g‘li

Researcher

Abstract

This study evaluated the period from emergence to 50% boll opening in 17 cotton hybrid combinations in the F₁ (2024) and F₂ (2025) generations. In F₁ hybrids, this period ranged from 105.5 to 110.5 days, with four combinations exhibiting the earliest maturity. In F₂ hybrids, T-175/248/16 × Sultan matured earliest at 107.5 days, while T-4679-81/16 × Sultan matured latest at 113 days, compared with 110.8 days for the Sultan control. The observed variation identifies promising combinations for breeding early-maturing cotton.

Keywords: Cotton, hybrid combinations, F₁ generation, F₂ generation, early maturity, boll opening, growth duration.

Introduction

In cotton (*Gossypium* spp.) development, the "emergence" and "50% maturity" stages are considered important phases in the plant's life cycle. These stages vary depending on the cotton variety, sowing time, soil-climatic conditions, and agrotechnical practices.



This stage begins when sufficient heat and moisture required for seed germination are available.

It typically occurs within 7–15 days after sowing.

Soil temperature must be above 12–14°C. Optimal germination is observed at a temperature of 20–25°C.

The seed must absorb water in an amount of 60–80% of its own weight.

Sowing the seed too deep delays emergence and weakens the seedlings (optimal depth is 3–5 cm).

When more than 75% of the field has fully emerged, the cotton is considered to have reached the "emergence" stage.

This is the process of cotton boll opening and readiness for harvest.

The indicator "50% maturity" refers to the state when half (50%) of the bolls on the cotton plants in the field are open. This period is considered the main indicator for the beginning of mass harvesting.

The total period from cotton emergence to 50% maturity can last from 120 to 150 days, depending on whether the variety is early-maturing or late-maturing.

Cracking of the bolls and emergence of the fiber. Natural yellowing or shedding of cotton leaves. Lignification of the stem and change in its color.

On an industrial scale, during the 50% maturity period (or slightly earlier), defoliation (artificial shedding of leaves) is carried out, which allows for high-quality and rapid harvesting of the crop (presented in Table 1).



Table 1 Indicators of the "emergence and 50% maturity" period of F1 combinations Year 2024

№	Hybrid combinations	"emergence - 50% maturity", (days)			hp
		M±m	Σ	V	
1	T-4672-73/16x Sulton	106.5±0.50	0.70	0.66	-1.5
2	T-4674-77/16 x Sulton	107.0±1.0	1.41	1.32	0.1
3	T-4679-81/16 x Sulton	107.0±1.0	1.41	1.32	-0.1
4	T-4684-86/16 x Sulton	106.0±1.0	1.41	1.33	-9.0
5	T-138/16 x Sulton	107.0±1.0	1.41	1.32	-1.0
6	T-470/1/16 x Sulton	105.5±0.5	0.71	0.67	-0.4
7	T-95/16 x Sulton	107.5±0.5	0.71	0.65	0.3
8	T-158/16 x Sulton	106.5±0.5	0.70	0.67	-1.5
9	T-200/16 x Sulton	105.5±1.49	2.12	2.02	1.1
10	T-MBG/16 x Sulton	109.0±1.00	1.41	1.29	2.3
11	T-58/16 x Sulton	106.5±0.5	0.71	0.66	-0.1
12	T-1979/16 x Sulton	105.5±0.5	0.70	0.67	-0.7
13	T-175/248/16 x Sulton	107.0±1.0	1.41	1.32	-0.1
14	T-12/06/16 x Sulton	106.0±1.0	1.41	1.33	-1.0
15	T-4747-48/16 x Sulton	105.5±0.5	0.71	0.67	-0.5
16	T- BSG /16 x Sulton	106.0±1.0	1.41	1.33	-0.6
17	T-588/16 x Sulton	110.5±0.5	0.70	0.64	9.0

In our experiment, the growth duration of 17 different types of hybrid combinations (T-4672-73/16 x Sulton and others) was analyzed, more precisely, the number of days from emergence to 50% maturity. For each combination, the mean value, standard deviation, and coefficient of variation were calculated.

With 105.5 days, the combinations T-470/1/16 x Sulton, T-200/16 x Sulton, T-1979/16 x Sulton, and T-4747-48/16 x Sulton fall into the earliest maturing group. With 110.5 days, the combination T-588/16 x Sulton is considered the latest maturing hybrid.



According to the analysis results, the last column shows the difference (hp) of each hybrid relative to the selection or control sample, where T-588/16 x Sulton (9.0) and T-MBG/16 x Sulton (2.3) stand out with a positive difference, while T-4684-86/16 x Sulton has the lowest value (-9.0).

It presents the indicators of the "emergence and 50% ripening" period of the F₂ generation hybrid combinations for the year 2025.

The table presents the vegetation period, expressed in days, of the Sultan variety (used as the control) and 17 F₂ hybrid combinations developed on its basis. For each hybrid combination, the mean value, standard deviation, and coefficient of variation were determined.

The F₂ hybrid combination T-175/248/16 × Sultan, with a vegetation period of 107.5 days, was the earliest-maturing combination.

In contrast, the F₂ hybrid combination T-4679-81/16 × Sultan, with a vegetation period of 113 days, had the longest vegetation period.

The Sultan variety itself had a vegetation period of 110.8 days. When compared with the mean values of the hybrid combinations, it can be observed that many F₂ combinations exhibited both earlier and later maturity than the Sultan variety.

REFERENCES

1. Namazov, Sh.E., Shamsutdinov, Sh.I., & Rakhmonqulov, M.S. (2000). The importance of interspecific hybridization in increasing cotton resistance to wilt disease. Paxtachilik va Donchilik Journal, No. 2, p. 13.[in Uzbek]
2. Namazov, Sh.E., Khomurodova, G.R., Boboev, S., Yuldasheva, R., Jumaeva, G., & Norqulov, I. (2011). Description of lines derived through intraspecific and interspecific complex hybridization. In Proceedings of the Republican Scientific and Practical Conference "Prospects for the Development of Cotton and Alfalfa Varieties Meeting World Standards," dedicated to the 20th anniversary of the Independence of the Republic of Uzbekistan, Tashkent, No. 31, p. 146. [in Uzbek]
3. Namazov, Sh.E., & Kholmurodova, G.R. (2018). Characteristics of convergent families and lines of medium-fiber cotton based on valuable economic traits.



***Modern American Journal of Biological and
Environmental Sciences***

ISSN (E): 3067-7920

Volume 2, Issue 8, August 2026

Website: usajournals.org

***This work is Licensed under CC BY 4.0 a Creative Commons Attribution
4.0 International License.***

In Proceedings of the International Scientific and Practical Conference
“Current Problems and Prospects for the Development of Genetics, Breeding,
Seed Production, and Agricultural Technologies of Crops,” Tashkent, p. 108.
[in Uzbek]

4. Omar M.A., Abdel-Bari A.A. sitologicheskoe izuchenie nekotorykh
mejvidovnykh gibridov roda Gossypium L. // Genetika. –M., 1973.– T.IX, № 7.
–S.163–166.