

Growth and Development Characteristics of Winter Wheat Under High Temperature Conditions

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Abstract

This article analyzes the physiological processes of winter wheat under high temperature (heat) conditions, their effects on growth stages, and changes in yield indicators. The importance of selecting heat-tolerant varieties and applying appropriate agrotechnical measures in hot climates is discussed.

Wheat (*Triticum aestivum* L.) is an important food crop for Uzbekistan and the entire world. Ensuring the food security of the population depends on the stable productivity of wheat crops. However, global climate change, especially the impact of high temperatures, negatively affects the development of this crop [1].

High temperatures (above 35°C) affect the vegetative and generative stages of winter wheat in the following ways:

- Decrease in the photosynthesis process
- Increase in transpiration in the leaves
- Disruption of protein and starch synthesis
- Shortening of the maturation period [2].

Effects of heat stress on phenological stages:

- Vernalization stage: High temperatures may prevent the fulfillment of vernalization requirements, negatively affecting seedling emergence.
- Flowering and grain filling stage: During this stage, high temperatures reduce pollen viability and disrupt fertilization.
- Yield quantity: Heat stress reduces the number of grains per spike and decreases grain weight.

Table 1.

Germination Process of Winter Soft Wheat Varieties at 35°C

№	Variety Name (35°C)	Shoot Length, cm	Root Length, cm	Number of Roots, pcs
1.	Krasnodarskaya-99 (control)	4,45±0,38	2,9±0,19	3,7±0,153
2.	Andijon-2	8,5±0,79	4,98±0,46	4,75±0,33
3.	ASR	6,4±0,34	5±0,21	3,8±0,22
4.	Bobur	7,4±0,52	4,5±0,24	3,8±0,19
5.	Andijon-4	9,05±0,26	4,65±0,27	4,6±0,28
6.	Drujba	9,6±0,26	5,5±0,28	4,75±0,22
7.	Grom	5,5±0,44	2,4±0,22	3,2±0,26
8.	Vassa	7,3±0,57	5±0,22	3,95±0,25
9.	Brigada	12,2±0,6	8,5±0,54	4,85±0,18
10.	Kroshka	6,7±0,45	3,3±0,38	3,85±0,31
11.	Ultra	11±0,9	7,4±0,6	4,75±0,37
12.	Jiva	11,2±0,86	7,5±0,7	4,6±0,34

Conclusion

Under high temperature conditions, the selection of suitable winter soft wheat varieties, proper determination of sowing dates, and correct implementation of agrotechnical measures are of great importance for optimal growth. Agricultural policies and breeding efforts adapted to climate change play a decisive role in this regard [3].

References

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