

Growing stages of Sorghum

Annamuratova Dilorom Raxmanovna
Doctor of Philosophy in Biological Sciences
Latipova Ruzajon Shavkatovna
Second-year PhD student in Plant Science

Sorghum, a highly versatile and drought-resistant crop, follows a precise and predictable growth cycle that can be divided into three primary stages. Each of these stages lasts approximately 30-35 days, encompassing critical phases that contribute to the overall development and yield of the crop. Understanding these stages is essential for farmers and agronomists to optimize cultivation practices and maximize productivity.

1. Vegetative Growth Stage

Duration: From seedling emergence to the formation of reproductive organs (approximately 30-35 days).

During the vegetative growth stage, sorghum focuses on establishing its root system and leaf canopy, which are crucial for photosynthesis and nutrient absorption. This stage includes the initial phases of development, where the plant is highly sensitive to environmental conditions and damage.

Key Phases:

- **Phase 0 - Seedlings:** The duration of this phase varies based on soil temperature, humidity, crop residues, seeding depth, and seed vigor. Optimal soil conditions are crucial for quick and uniform seedling emergence.
- **Phase 1 - 3rd Leaf:** Occurs 0-20 days after seedling emergence. During this phase, the growth point is located underground, making the plant vulnerable to damage from pests or adverse weather conditions. Any damage to the leaves can delay subsequent stages.
- **Phase 2 - 5th Leaf:** This phase takes place 20-25 days post-germination, with the growth point emerging above the soil surface. Rapid root system development and nutrient accumulation characterize this phase, preparing the plant for vigorous growth.
- **Phase 3 - Branching:** Approximately 30-40 days after germination, the plant undergoes maximum growth and nutrient assimilation. During this phase, the panicle formation begins, which is critical for the plant's reproductive success.

2. Reproductive Stage

Duration: From the appearance of the panicle to flowering (approximately 30-35 days).

This stage marks the plant's transition from vegetative growth to reproductive development. The focus shifts towards forming reproductive structures and preparing for pollination, which is essential for grain production.

Key Phases:

- Phase 4 - Flag Leaf: During this phase, the plant exhibits rapid growth of the stem and leaf apparatus. The flag leaf, which is the last leaf to form before the panicle, emerges. At this stage, the plant accumulates more than 30% of the required nitrogen, over 20% of phosphorus, and more than 40% of potassium.
- Phase 5 - Growth Arrest: Occurring 50-60 days after germination, the leaf area reaches its maximum size, and the top of the plant begins to elongate. The plant's energy is redirected from vegetative growth to reproductive development.
- Phase 6 - Flowering: The panicle, or whisk, forms, and less than half of the plants in the field bloom. This phase is crucial as it determines the potential yield. The plant accumulates 70% of the required nitrogen, 60% of phosphorus, and over 80% of potassium, which are vital for successful flowering and grain setting.

3. Grain Filling Stage

Duration: From flowering to the completion of dry matter accumulation in the grain (approximately 30-35 days).

The grain filling stage is critical for the final yield and quality of the sorghum crop. During this stage, the plant shifts its focus from vegetative growth to grain development, ensuring that the grains receive the necessary nutrients for optimal growth.

Key Phases:

- Phase 7 - Soft Grain: Grain formation begins immediately after flowering, with the grains rapidly filling. The stem loses weight due to the redistribution of nutrients to the developing grains. This phase is marked by the formation of panicles and grains, which are essential for the final yield.
- Phase 8 - Hard Grain: During this phase, the grain achieves 75% of its final dry weight, and nutrient accumulation concludes. The lower leaves cease functioning as nutrients are redirected to the grain. This phase is crucial for determining the grain's final weight and quality.

- Phase 9 - Physiological Maturity: The grain reaches its maximum dry mass, with a moisture content of around 25-35%. This phase signifies the end of the grain filling stage and the readiness of the crop for harvest.

Understanding the detailed growth stages and phases of sorghum is vital for effective cultivation and management. Each stage demands specific attention and care to ensure optimal growth, nutrient uptake, and ultimately, a successful harvest. By closely monitoring and addressing the needs at each phase, farmers can maximize yield, ensure the quality of the sorghum crop, and contribute to sustainable agricultural practices.

References:

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