Soybean Life Cycle 101, How to Grow What Make Best Health Food Nutrition, 5-10 min Nature Crop Plant

The life cycle of soybeans can be divided into two categories: vegetative growth (B stages from Bay VC V1 to VN) and reproductive growth (stages from R1 to R8).

In general, soybeans are planted in the spring, and their growth begins with the germination and emergence of cotyledons from the soil surface, known as the vegetative emergent survey stage. This stage lasts about 5 to 15 days from planting to bay. During emergence, the cotyledons break through the soil surface, and primary and lateral root growth begins. Root hairs develop shortly after planting, which is essential for nutrient uptake and water absorption during this early stage. When the unifoliate leaves unfold, the plant reaches the vegetative cotyledon (VC) stage, which takes about three to ten days from bay to VC.

Stages of Growth

Cotyledon stage: After the cotyledons are fully exposed, unifoliate leaves emerge and unroll at the node, initiating energy production through photosynthesis in the VC stage. The cotyledons serve as the main nutrient reservoir for young soybean plants, and their loss during this stage may reduce soybean yield. When the first trifoliate leaves, consisting of three leaflets, are fully expanded, the plant reaches the first trifoliolate (V1) stage.

V1 stage: The V1 stage occurs about three to ten days from bay to V1. Trifoliate leaves unroll, and the fully developed

trifoliolate leaves are at the unifoliate nodes (first node). At this stage, the plant becomes self-sustaining as the newly developed trifoliolate leaves carry out photosynthesis.

V2 stage: The V2 stage occurs about three to ten days from V1 to V2. In the V2 or second trifoliolate stage, the second trifoliolates unroll, and the fully developed trifoliate leaves are at the second node, which is above the unifoliate node. Nodules are initiated and developed on the roots at this stage, and nitrogen fixation by the plant begins to occur when plants reach six to eight inches in height, continuing until late reproductive stages. Effective nodulation results in higher yields and more seed protein compared to non-nodulated soybean plants.

Vegetative growth stages (VN or n trifoliolate stage) continue as long as the plant produces trifoliolates and until it begins to flower. The root system continues to grow, expanding across 30-inch row spacing from the V1 stage onward, depending on environmental conditions.

V5 stage: New nodes appear every three to ten days until the V5 or fifth trifoliolate stage, and beyond V5, new nodes appear every two to five days. When the plant begins to set flowers, soybean growth enters the reproductive stage, progressing through pod development, seed development, and plant maturity from stages R1 to R8.

Flowering

Flowering begins on the third to sixth node, continues up and down the main stem, and eventually extends to the branches. Nodes on the main stem usually have at least one flower. Vertical roots, secondary roots, and root hairs continue to grow rapidly until R4 or R5, which takes about seven days from R1 to R2.

R2:

In the R2 or full bloom stage, the plant has open flowers on at least one of the two uppermost nodes on the main stem, with fully developed leaves. The plant has accumulated about 25% of its total dry weight and nutrients and about 50% of its mature height. Nitrogen fixation by root nodules also increases rapidly.

R3:

It takes about 5 to 15 days from R2 to R3. In the R3 or beginning pod stage, the flowers are pollinated, and the ovules begin to develop into pods. Pods that are 3/16 inch or five millimeters long are formed on at least one of the four uppermost nodes on the main stem. Favorable growing conditions during this period may result in a greater number of pods, seed number per pod, or seed size, increasing the yield potential. It takes about 5 to 15 days from R3 to R4.

R4:

In the R4 or full pod stage, the pods continue to grow rapidly and are fully formed. Pods that are 3/4 inch or two centimeters long are developed on at least one of the four uppermost nodes on the main stem. Seasonal nitrogen uptake relative to the final amount attained at maturity occurs around this stage. It takes about 4 to 26 days from R4 to R5.

R5:

In the R5 or beginning seed stage, the seeds within the pods begin to develop and enlarge. 1/8 inch or three-millimeter long seeds are present in at least one of the four uppermost nodes on the main stem. Primary and lateral roots grow strongly, and about half of the nutrients required for seed filling come from the plant’s vegetative parts, while the other half comes from nitrogen fixation and nutrient uptake by

the roots. Nitrogen fixation peaks and plants attain maximum height, node number, and leaf area at this stage.

R6:

It takes about 11 to 20 days from R5 to R6. In the R6 or full seed stage, the seeds within the pods reach their full size and weight. Pods with green seeds that fill the cavity are present in at least one of the four uppermost nodes on the main stem. By the time the plant reaches the R6 stage, most of the nutrients have been taken up. Total pod weight peaks, and the leaves begin to yellow. It takes about nine to thirty days from R6 to R7.

R7:

In the R7 or beginning maturity stage, the seeds within the pods start to change color from green to yellow or brown. At least one normal pod on the main stem also loses its green color and reaches its brown or tan mature color. Seed dry matter begins to peak. It takes about 7 to 18 days from R7 to R8.

R8:

In the R8 or full maturity stage, the seeds within the pods reach their maximum dry weight, and the pods begin to dry out and turn brown. Pods should reach full maturity when 95% of the pods have attained their mature pod color. Typically, five to ten days of good drying weather after the R8 stage are needed to obtain soybean seeds with a moisture content level of less than 15%.

Harvesting:

Harvesting soybeans typically takes place in the fall, from late August to early November, after the pods reach full maturity.

In summary, soybeans go through several distinct growth stages during their life cycle, which can vary depending on the soybean variety, local climate, and growing conditions. The entire life cycle of a soybean plant typically lasts between 100 and 120 days from planting to maturity.

Soybean dishes:

Soybean is an important source of human food, livestock feed, and biofuels. It can be used in a wide range of dishes, such as:

- Soy milk: a plant-based alternative to cow’s milk.
- Tofu: made from soy milk and a popular ingredient in Asian cuisine.
- Edamame: young soybeans that are popular snack food.
- Soybean sprouts: a nutritious and tasty dish in Asian cuisine.
- Soy sauce: made from soybeans, wheat, and salt.

Benefits:

Soybean is gluten-free and rich in protein, with a protein content of around 40% by weight. It is also high in fat and dietary fiber. Soybean contains a range of vitamins, including Vitamin K, Vitamin C, and the B vitamins. It is also rich in minerals such as iron, calcium, phosphorus, potassium, and magnesium. However, allergies to soybean are common, and it is listed among other foods that can cause allergies, such as milk, eggs, peanuts, tree nuts, and shellfish.