Science Societies

The soybean growth cycle: Important risks and management strategies

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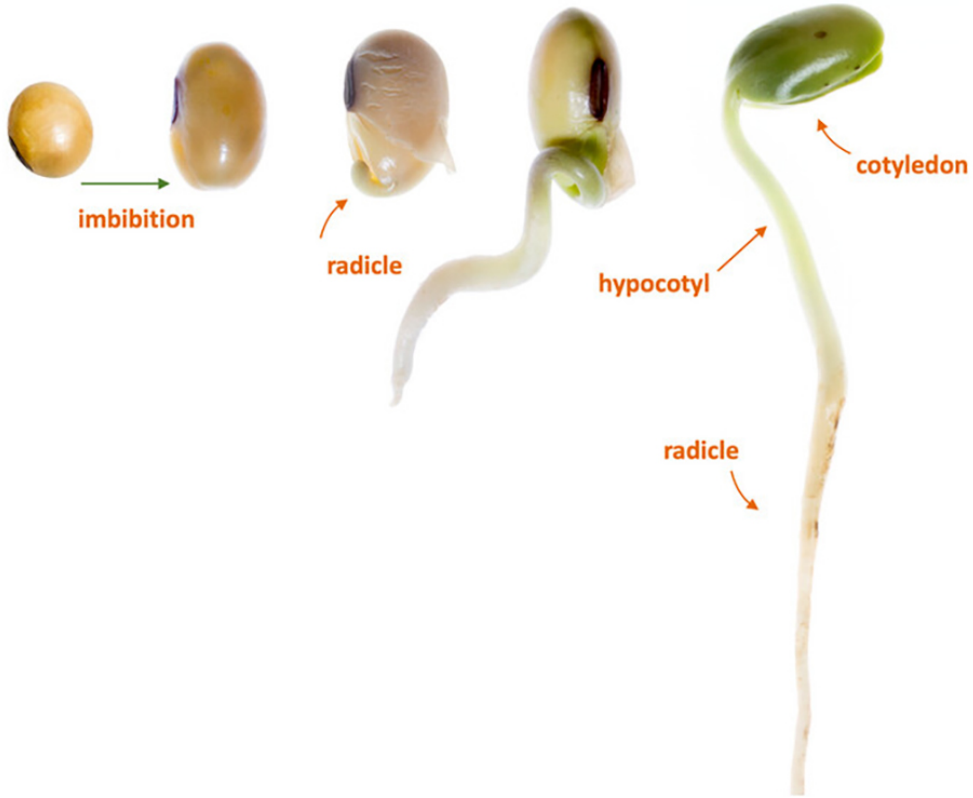

Soybean seed germinates after absorbing (imbibing) ?50% of its weight in water. The radicle (root) develops first, followed by the hypocotyl. The hypocotyl pushes the cotyledons above the soil surface (picture from Broeske et al., 2017).

Optimal soybean production requires accurate, stage-specific management practices to mitigate abiotic and biotic stressors. From emergence to full maturity, a soybean plant's physiological needs and vulnerabilities change as it transitions through its vegetative and reproductive cycles. This management guide details each growth stage, provides clear descriptions, and identifies the common risks encountered. For different growth stages, strategic management recommendations are presented, emphasizing proactive approaches to mitigate potential yield limitations.

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1. Which soybean vegetative stage is defined by the presence of two fully developed trifoliolate leaves?

a. V2.

b. V3.

c. VE.

d. VC.

2. The R1 growth stage in soybean is defined as

a. first pod visible at any node.

b. full flowering at the top two nodes.

c. beginning seed formation.

d. beginning bloom at any node on the main stem.

3. Which reproductive stage marks the beginning of pod development?

a. R2.

b. R3.

c. R4.

d. R5.

4. During which stage is soybean typically most sensitive to stress affecting yield potential?

a. V2.

b. V3.

c. R5.5.

d. R7.

5. Yield in soybean is primarily determined by

a. Number of pods per plant and seed size.

b. Number of branches per plant.

c. Final plant height.

d. Days to emergence.

6. Avoid planting soybeans if soil temperatures _____ are anticipated during the critical 24- to 48-hours after planting.

a. <70°F

b. <60°F

c. <50°F

d. <40°F

7. Soybean plants can compensate for early-season stand reductions by increasing branching and pod production.

a. True.

b. False.

8. The R5 growth stage is characterized by

a. beginning bloom.

b. beginning pod.

c. beginning seed.

d. full maturity.

9. Which growth stage marks the start of physiological maturity?

a. R6.

b. R7.

c. R8.

d. R5.

10. For indeterminate soybeans, the leaf area index continues to increase through which stage?

a. V1.

b. R1.

c. R5.5.

d. R7.

11. As the soybean plant develops, specific stresses become more pertinent.

a. True.

b. False.

12. Management decisions such as fungicide or insecticide applications are often timed relative to

a. growth stage.

b. days after planting only.

c. calendar date only.

d. soil temperature.

13. While pod number dictates the potential for seed count and size, plants will abort seed based on

a. inoculant strain.

b. soybean variety.

c. day of the year.

d. accumulated sugar levels in vegetative tissues and exposure to stress.

14. At R6, soybean seeds

a. are just beginning to form.

b. have reached full size but are still green.

c. have reached harvest moisture.

d. have completely dried down.

15. At what stage should final stand counts be taken?

a. VE.

b. VC.

c. R6.

d. R8.

16. The VC growth stage in soybean occurs when

a. the first trifoliolate leaf is fully expanded.

b. unifoliolate leaves are fully unrolled.

c. two trifoliolate leaves are fully expanded.

d. the cotyledons have completely senesced.

17. Stress occurring during the R2 stage is most likely to affect

a. root nodulation only.

b. plant height only.

c. flower retention and pod initiation.

d. seed dry-down rate.

18. Maintaining optimal plant health during seed development is critical for maximizing both seed number and size, which are essential components of final yield.

a. True.

b. False.

19. Which management decision is most dependent on accurate identification of reproductive growth stages?

a. Tillage timing.

b. Row spacing selection.

c. Timing of foliar fungicide applications.

d. Variety relative maturity selection.

20. What characterizes the green stem syndrome?

a. Leaf retention, stems remain green despite pod and seed dry-down.

b. Leaf senescence.

c. Increased plant growth.

d. New flowers continue to form.

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