



SOYBEAN PRODUCTION

Soybean growth, development and yield are results of the genetic potential of the variety grown and how the soybean plant interacts with the environment. Growers can obtain higher yields and increase profit by understanding how soybean plants respond to production practices.

GROWTH STAGES

Growth stages can overlap within a field. A growth stage begins when the majority (50 percent or more) of the plants in a field are at or beyond that stage.

Vegetative stages

VE: Emergence

VC: Unrolled unifoliolate leaves

V1: First unrolled trifoliolate leaf

V2: Second unrolled trifoliolate leaf

V(n): n-th unrolled trifoliolate leaf

Reproductive stages

Bloom – R1 and R2

R1: Beginning bloom

Plants have at least one open flower at any node.

R2: Full bloom

Plants have an open flower at one of the two uppermost nodes on the main stem.

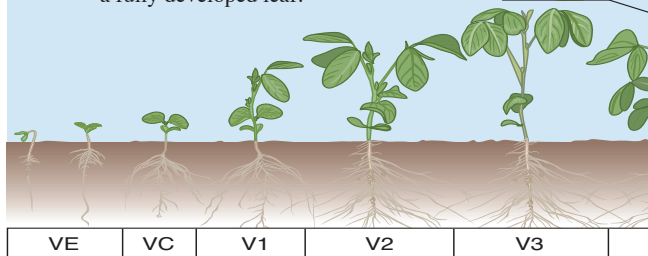
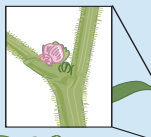
Pod development – R3 and R4

R3: Beginning pod

Pods are $\frac{3}{16}$ -inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.

R4: Full pod

Pods are $\frac{3}{4}$ -inch long at one of the four uppermost nodes on the main stem with a fully developed leaf.



Reprinted with permission from *Pocket Guide to Crop Development* © 2003,

GROWTH STAGES

Seed development – R5 and R6

R5: Beginning seed

Seeds are $\frac{1}{8}$ -inch long in the pod at one of the four uppermost nodes on the main stem.

R6: Full seed

Pods contain green seeds that fill the pod to capacity at one of the four uppermost nodes on the main stem.

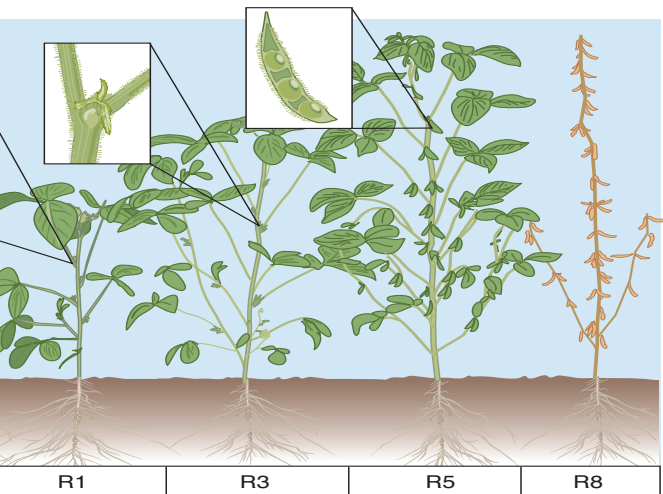
Maturity – R7 and R8

R7: Beginning maturity

One pod on the main stem has reached its mature color (tan or brown).

R8: Full maturity

Ninety-five percent of the pods have reached their mature color.

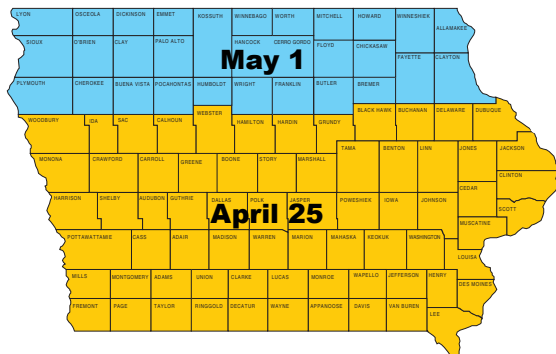


Board of Trustees, University of Illinois

PRODUCTION RECOMMENDATIONS

Planting date

Soybean planting should be initiated based on calendar date, seedbed conditions and the weather forecast for 48 hours after planting. It is critical to have a good seedbed. If significant rainfall is forecast, wait until conditions improve before planting to avoid soil crusting. Variety selection is very important when planting early since some diseases may be more problematic in early planted fields.



Recommended planting dates are April 25 for the southern two-thirds of Iowa (gold) and May 1 for the northern third of Iowa (blue).

Effect of delayed planting on yield

Soybean fields with high yield potential (>50 bu/acre) may lose 0.3-0.7 bu/acre/day with the largest yield reductions occurring after May 10. Fields with lower yielding potential may lose approximately 0.1-0.2 bu/acre/day. Therefore, high-yielding fields should be planted first.

PRODUCTION RECOMMENDATIONS

Replant decisions

Soybean replant decisions should be based on accurate stand counts and other factors, such as yield potential of the existing stand, replanting date, maturity group and the true cost of replanting. In general, a stand of 73,000 (or more) healthy, uniformly spaced plants per acre in early June or later should be worth keeping.

Determining plant populations

Plant stand should be measured from 10 randomly selected areas of the field, not the best- or worst-appearing areas. Within-row gaps should be included in random samples for stand counts. Measure the row length representing 1/1000th of an acre (table below). The average number of plants from the 10 counts multiplied by 1,000 is the plant population.



Length of row needed to represent 1/1000th of an acre

Row width	Feet to measure
38-inch	13 feet, 9 inches
36-inch	14 feet, 6 inches
30-inch	17 feet, 5 inches
20-inch	26 feet, 2 inches
15-inch	34 feet, 10 inches
10-inch	52 feet, 3 inches
7-inch	74 feet, 9 inches



PRODUCTION RECOMMENDATIONS

Reduced stand effect on yield

Soybean plant populations can vary widely without significant yield loss. Soybeans can compensate for low stands, producing similar yields across a wide range of plant populations. Moreover, the establishment of a uniform soybean stand can assist in suppressing early-season weeds. The optimum seeding rate will vary, depending on field conditions, soil types, seed quality, seedbed conditions, planting speed and depth and planter type. Target populations at harvest should be no less than 100,000 healthy, uniformly-spaced plants per acre.

Effect of seeding rate on yield and final stand across five locations in Iowa

Seeding rate	Yield	Final stand
75,000	61.2 c	60,600 e
100,000	64.1 b	75,800 d
125,000	65.7 ab	94,000 c
150,000	66.4 ab	106,500 c
175,000	66.7 a	121,200 b
200,000	66.9 a	134,200 a

Numbers followed by the same letter within a column are not significantly different.