

Mark Jeschke, Ph.D., Pioneer Agronomy Manager

## DECISIONS FOLLOWING HAILSTORMS

Hailstorms are a common occurrence during the growing season yet making decisions on what to do with a damaged crop can be agonizing. The following guidelines can be utilized to assess your situation.

### ASSESSING YOUR STANDS

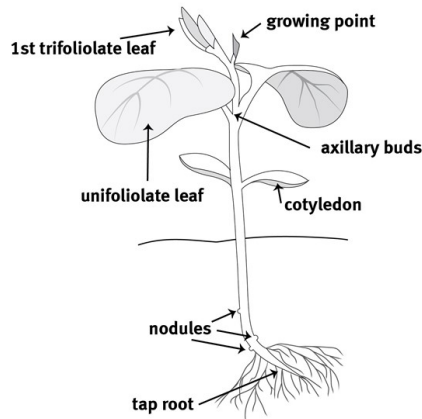
Count the number of plants in 10 feet of row. Divide by 10 to obtain plants per foot of row. For drilled soybeans, 30 plants in a 3x3 foot square equal 150,000 plants per acre. A hula hoop is a good tool. Randomly roll the hoop and count the plants inside the hoop after it settles. Plants per hoop can be converted to plants per acre using the multiplication factor below. Always check several areas of a field, as hail damage can vary greatly throughout a field.

**Table 1.** Stand count calculation factors by row width.

Hoop Diameter (inches)	30	32	34	36
Multiplication Factor	8,878	7,808	6,912	6,165

Unlike corn plants, which have one growing point, soybean plants have many growing points located at the base of each leaf. As long as these growing points are not injured, new growth can occur from any point.

There are no growing points below the cotyledons. A plant cut or seriously injured below this point will not regrow. Leaf tissue is important for regrowth, as leaves produce the food needed for growth. Injured plants with the equivalent of one cotyledon or one leaf have a good chance of recovery. If no leaves remain, regrowth will be very slow, even if growing points remain intact.



It is often difficult to determine damage until a few days after a storm. Soybeans add a new trifoliolate every three to five days under normal conditions. When determining stands, count questionable plants as one-half. After a potential surviving stand level is determined, estimate its yield potential.

Soybeans in the vegetative stage can compensate well for thin stands. In general, one-half of a stand may produce close to 90 percent of a normal yield; one-fourth of a stand may produce 75 percent of a normal yield. In 30-inch rows, 3-4 plants per foot is an acceptable stand if there are no large gaps and weeds are controlled. In 7.5-inch rows, 1.5-2 plants per foot of row are acceptable. Estimate yields accordingly or use the chart below.

**Table 2.** Stand reduction loss chart.

Row Width (inches)				Plants per Acre	Yield Optimum %
38	30	15	7.5		
Number of plants in 10 feet of row					
131	103	52	26	180,000	100
102	80	40	20	140,000	100
87	69	34	17	120,000	99
73	57	29	14	100,000	94
58	46	23	11	80,000	86
44	34	17	9	60,000	76
29	23	11	6	40,000	64
15	11	6	3	20,000	46

## PLANT DAMAGE

Damage to leaves and stems is more difficult to judge in soybeans than corn because soybeans have more flexibility for regrowth. In very young soybean plants, some leaf area is critical for recovery. Young soybean plants can tolerate a fair amount of leaf loss without significant yield loss. Before flowering, losses are determined by cut-off or bent over (broken) branches. First, estimate the number of original nodes located above cotyledons per plant. Then, count the number of nodes above stems that have been cut or broken, and calculate the percentage. Refer to Table 3 to estimate yield loss. For example, in a 20-plant sample of plants with four original nodes, four of the plants are cut above the second node, and four plants are broken above the second node. Of the 20-plant sample, 16 nodes remain. (80 original nodes = 20 percent = 3 percent loss).

**Table 3.** Estimated soybean yield loss from cut or broken nodes.

Growth Stage	Nodes Cut or Broken (%)					
	10	20	30	40	50	60
V1-VN	1	3	4	6	9	14
R1	2	4	6	9	11	17
R2	3	6	8	11	13	19
R2.5	4	9	12	16	20	28
R3	6	12	17	22	28	36
R3.5	8	16	23	31	39	49

Source: National Hail Insurance Association

After flowering, yield losses from cut or broken plants increase dramatically, as do yield losses directly attributed to defoliation (Table 4).

**Table 4.** Estimated soybean yield loss from defoliation.

Growth Stage	Defoliation (%)					
	10	20	40	60	80	100
V1-VN	0	0	0	0	0	0
R1	0	1	3	4	6	12
R2	0	2	5	7	12	23
R2.5	1	2	5	9	15	28
R3	2	3	6	11	18	33
R3.5	3	4	7	13	24	45
R4	3	5	9	16	30	56
R4.5	4	6	11	20	37	65
R5	4	7	13	20	43	75
R5.5	4	7	13	23	43	75
R6	1	6	11	18	31	53
R6.5	0	1	3	5	13	23

Source: National Hail Insurance Association

## STEM DAMAGE

Damage to stems is difficult to judge. Generally, plants that survive stem injury will produce normal yields. However, they will be more susceptible to lodging in the fall, possibly reducing harvestable yields.

## WEED COMPETITION

Timely cultivation is often a good option if possible. It is always a good option to consider your herbicide options carefully following crop injury. A balance between adequate weed control and avoiding herbicides that may cause stunting or burning of the plant can be a challenge.

## DETERMINE REPLANT POTENTIAL

If the condition of the existing stand is questionable, assess the potential for replanting. Always check with your insurance provider prior to replanting for options and considerations. For most of the arable land which soybeans are grown, soybeans can be planted up to a date of June 20th and have the potential of achieving 80% or more of the optimum yield potential.

## MATURITY OF A VARIETY FOR REPLANTING

In general, it is suggested to use an adapted, medium-full season variety for your region. Replanted soybeans will have less time to grow the plant structure before they begin flowering. As such, late planted soybeans may not attain full height and canopy. Fuller-season soybeans usually can attain more growth before flowering, which helps set more of the pods at a harvestable height. Consider increasing seeding rates 10-20% if establishing a crop canopy is a concern.

## REPLANTING INTO EXISTING STANDS

Many times, it appears as if this practice would be the best option. Consider the following prior to doing so:

- Planting between rows means driving on old rows.
- Will existing soybean plants outgrow and shade newly emerged plants?
- Does cultivation of the crop present a problem?
- Is the difference between planting dates going to be enough that the plants will mature at different times, creating a harvest problem?

There are exceptions to this comment however in most cases, it is best to either leave the existing stand or destroy it and replant rather than attempting to interseed.

## SOYBEAN DECISION WORKSHEET

### Keep Existing Stand

Potential Yield (Table 2) \_\_\_\_\_ %  
 Cut/Broken Node Adj. (Table 3) (\_\_\_\_\_) %  
 Expected Yield = \_\_\_\_\_ %  
 Yield Goal X \_\_\_\_\_ bu/acre  
 Commodity Price X \_\_\_\_\_ \$/bu  
 Estimated Income = \_\_\_\_\_ \$/acre

### Replant

Potential Yield (Table 4) \_\_\_\_\_ %  
 Yield Goal X \_\_\_\_\_ bu/acre  
 Commodity Price X \_\_\_\_\_ \$/bu  
 Replant Costs (tillage, seed, etc.) (\_\_\_\_\_) \$/acre  
 Estimated Income = \_\_\_\_\_ \$/acre

The foregoing is provided for informational use only. Please contact your Corteva sales professional for information and suggestions specific to your operation. Product performance is variable and depends on many factors such as moisture and heat stress, soil type, management practices and environmental stress as well as disease and pest pressures. Individual results may vary. Products are provided subject to the terms and conditions of purchase which are part of the labeling and purchase documents. FF210610