



## Corn Replanting Process for Southern United States

- Deciding to replant corn, whether due to a failed stand after planting or stand loss after a storm can be a difficult decision.
- The first step is to assess the quality of the stand and estimate the yield potential of the crop. This can only be accomplished by determining the growth stage, number of living plants, and if the stand loss was caused by a storm the amount of leaf damage.
- Replant cost including seed, labor, tillage, and chemistry should be considered.

### Determining the Growth Stage

Corn growth stages before tassel emergence are determined by the number of leaves on the plant. The first leaf to emerge is the coleoptile (spike) and signifies emergence or VE growth stage. When the coleoptile leaf expands, it has a rounded tip and is considered vegetative emergence or V1 when its collar is fully exposed (Figure 1). Future vegetative stages are based on the coleoptile leaf and should be accounted for regardless of its disappearance. Leaf stages are only counted when the leaf collar is visible (Figure 1). Once the tassel emerges from the topmost leaf whorl (the VT stage) corn enters the reproductive stages. Stage R1 refers to the emergence of silks from the ear.

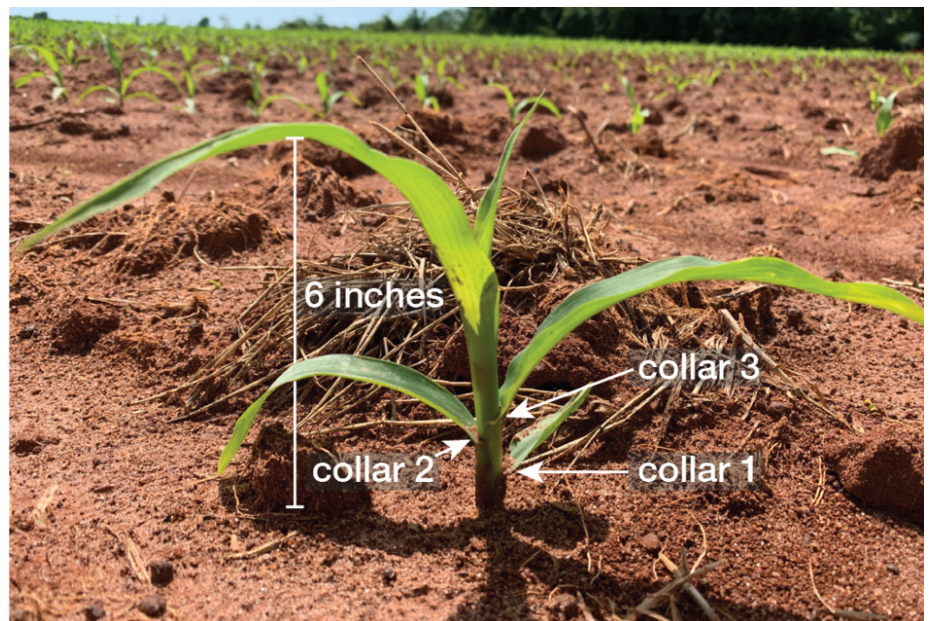
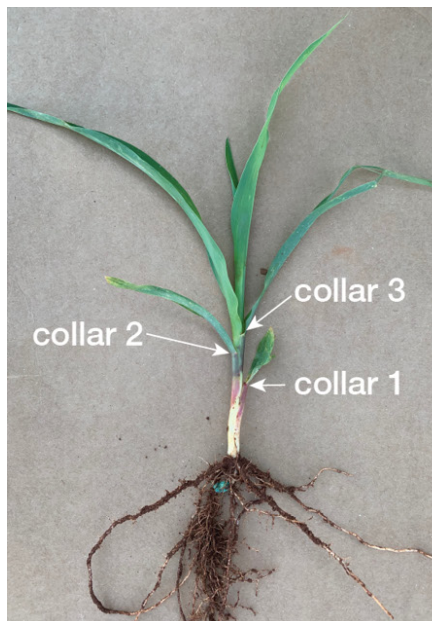


Figure 1. Corn plant at V3 growth stage. Note the presence of three visible leaf collars. When the coleoptile leaf (associated with collar 1) first appears from the soil, the plant is referred to as being at VE growth stage. When the leaf collar is fully visible for the coleoptile leaf, the plant is at V1. With each succeeding exposed leaf collar, the plants are staged by its leaf number, V1, V2, etc. until the tassel emerges.

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When examining a corn plant during vegetative growth with considerable leaf loss, the stage of development can be determined by splitting the lower stalk lengthwise and counting the internodes. Starting at the bottom of the stalk are four compressed nodes that are hard to distinguish from one another; however, the node clearly visible after the compressed nodes is the fifth leaf node. The vegetative stage can be determined by using this node as a reference point and counting the number of elongated internodes above this fifth leaf. The node corresponds to the leaf count, so the fifth node is the fifth leaf and so on. For more information on corn growth stages please see [Determining Corn Growth Stages](#).

## Determine the Damaged Plants

After emergence failure or a damaging event, the number of viable plants should be determined. With failure to germinate, emerged, viable plants should be counted. If the plants are damaged by hail, herbicide, or other injury, the health of the growing point should be determined by splitting the stem down the center, to expose the growing point (Figure 2).

Prior to V4 to V5, the growing point is below the soil surface and appears as a mass of dense tissue at the base of the plant. By V6 the growing point can be found about 1 to 1.5 inches above the soil surface and appears to be a dome shaped area of dense tissue (Figure 2). From V8 to tassal (VT), the growing point can be found above the elongating internodes. By VT, the growing point has differentiated into the tassel. A healthy growing point should appear light green to whitish. When a growing point dies it appears watery, soft, and brownish and as such, the plant should be considered as non-viable. However, if the injury is above the growing point, the plant can survive and should be considered viable.

If the damage is related to hail or wind whip, it may result in the dead leaves interfering with normal leaf emergence. In most cases, the plant can “push” through this type of injury, but if the new leaves roll into a tight “buggy-whip” they should be considered non-viable as well.



**Figure 2. The exposed growing point of a corn seedling after spitting the stalk.**

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## Determine the Population

In several, random field locations, measure the length of row necessary to represent 1/1000th of an acre, count the viable plants within that distance, and multiply by one thousand to obtain the viable plants per acre (Table 1). (As an example, 23 plants in 17 feet, 5 inches for a 30-inch row = 23,000 plants/acre)

Row Width (inches)	Row Length for 1/1000th of Acre (feet, inches)
7.5	69' 8"
15	34' 10"
20	26' 2"
22	23' 9"
30	17' 5"
36	14' 6"

## Determine Yield Potential

Information from North Carolina State University suggests a remaining plant population greater than 20,000 to 22,000 plants per acre is still has an opportunity for a profitable yield potential.<sup>1</sup> If the remaining plant population is between 18,000 and 20,000 plants per acre, replanting should be carefully considered. A yield reduction of about 10% is possible when the plant population is between 18,000 and 20,000 plants per acre on soils with a realistic yield expectation of over 130 bushels per acre. On soils where the yield expectation is below 130 bushels per acre, there is still an opportunity for corn yields to reach that level.

When the plant population is below 18,000 plants per acre and there is calendar time to plant an alternative crop with a good chance of normal yield potential, then replanting should be considered. A corn crop with less than 18,000 plants per acre is unlikely to yield over one hundred bushels per acre under normal conditions. Yield reductions of 25 to 40% are common when the plant population is less than 18,000 plants per acre.

## Determine Yield Potential Due to Leaf Loss

In addition to lost plants, leaf loss on the plants that survive should be considered. Table 2 lists the effect of various amounts of leaf loss on yield potential at different growth stages. Note that leaf loss has less effect on yield potential when it occurs either early or late in the growth of the corn plant. Leaf loss estimates should be taken in several random areas of the field. For additional information, please visit [Mid-Season Hail-Damaged Corn](#).

Growth Stage	Percent Leaf Loss					
	10	20	40	60	80	100
Percent Yield Loss						
V7	0	0	1	4	6	9
V10	0	0	4	8	11	16
V13	0	1	6	13	22	34
V16	1	3	11	23	40	61
VT	3	7	21	42	68	100
Late Milk	1	3	10	21	35	50
Dent	0	0	4	10	19	23

\*Percentages of loss from Corn Loss Adjustment Standards Handbook, Leaf Loss Chart, Exhibit 15, United States Department of Agriculture.<sup>4</sup>





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## *Determine if Replanting is Necessary*

To determine if replanting is necessary, a realistic yield potential without injury should be determined. After the realistic yield is determined, multiply it by the percent yield reduction expected from the remaining plants.

For example, the final potential yield estimate for a V10 growth stage stand with a realistic yield potential of 150 bu/acre, a remaining plant population of 19,000 plants/acre, and an expected 10% yield reduction (15 bu/acre) would be 135 bu/acre.

With plant injury, estimate the leaf damage, for this example it is 40% which equals 4% yield loss from Table 2.

The adjusted yield of 135 bu/acre  $\times$  .04 = 5.4 bu/acre for a final yield estimate after damage to be 129.6 bu/acre.

Costs to replant, such as destroying the current crop, seed, seed bed preparation, and planting should be considered. In this example, it is unlikely this grower would gain profitability by replanting if the damage has occurred after May 10 (a likely date if the corn is at V10). In fact, it would take severe reductions in plant population and leaf area to justify replanting

## *How soon should the decision to replant be made?*

Patience is the key. Waiting at least three to five days after a storm provides a clearer picture of the extent of the damage. If replanting is being considered because of a first planting failure, a replanting delay is not really needed after a stand assessment.

## *If the field needs to be replanted, what is the first step?*

Eliminating the remaining plants is the first step. Plants can be killed by tillage, herbicide, or mowing if the growing point is above the soil surface. If the corn is 4- to 8-inches tall, clethodim herbicide is a recommended option.<sup>2</sup> However, if clethodim is used, replanting cannot occur until at least six days after application. If the field needs to be replanted prior to six days, an option is paraquat used in conjunction with atrazine and suggested adjuvants to enhance control.<sup>2</sup>

## *What relative maturity of corn should be used?*

If replanting because of a failed initial planting, a corn product with the same relative maturity (RM) could be planted. If replanting later in the season as the result of a storm, the RM of the corn product depends on many variables and the geography. In North Carolina and Virginia, a corn product ranging in RM from 108 to 114 days should be considered when replanting in June as later maturing products do not show improved yield potential when planted in June and result in harvest delays.<sup>3</sup>



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## Sources

<sup>1</sup>Heiniger, R.W. 2017. Replant guidelines for corn. North Carolina State University. <https://corn.ces.ncsu.edu/corn-production-information/replant-guidelines-for-corn/>

<sup>2</sup>Cahoon, C. and Flessner, M. 2017. Failed corn stand: Starting over. Virginia Ag Pest and Crop Advisory. Virginia Cooperative Extension. Virginia Tech University. <https://blogs.ext.vt.edu/ag-pest-advisory/failed-corn-stand-starting-over/>

<sup>3</sup>Heiniger, R. 2017. Management for late planted corn. North Carolina State Cooperative Extension. <https://corn.ces.ncsu.edu/corn-production-information/management-for-late-planted-corn/>

<sup>4</sup>Corn loss adjustment standards handbook. FCIS-25080 (11-2023). United States Department of Agriculture (USDA) and Federal Crop Insurance Corporation (FCIC). <https://www.rma.usda.gov/-/media/RMA/Handbooks/Loss-Adjustment-Standards---25000/Corn/2024-25080-Corn-Loss-Adjustment-Handbook.ashx>

Web sources verified 3/27/24.

## Legal Statements

### ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.

**Performance may vary**, from location to location and from year to year, as local growing, soil and environmental conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on their growing environment.

The recommendations in this material are based upon trial observations and feedback received from a limited number of growers and growing environments. These recommendations should be considered as one reference point and should not be substituted for the professional opinion of agronomists, entomologists or other relevant experts evaluating specific conditions.

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