



Cotton Replant Decisions

- There are many factors to consider when making a cotton replant decision.
- Cotton stands with as few as one to two healthy plants per foot may be acceptable, especially if the stand is uniformly spaced with minimal skips.
- If there is any doubt after stand assessment and careful consideration, it is probably best not to replant.

Evaluating the Existing Stand

Research in North Carolina indicates that a cotton replant should be considered if 30 percent of the field has three-foot skips or larger and the remaining plants are healthy.¹ This recommendation can change if the remaining plants are stressed. Larger skips like a six-foot skip can be counted as two 3-foot skips to help indicate larger gaps in the field.

To evaluate a stand, measure the row length needed for 1/1000th of an acre (Table 1) and count the number of plants within the measured row length. Multiply this number by 1000 to determine the plant population per acre. This should be completed at ten locations throughout the field.² Make note of crop condition, uniformity, and frequency of skips larger than two to three feet per foot of row. Uneven plant spacing, including skips in the row, can lower yield potential even if the average number of plants per acre is adequate for optimum yields.

Table 1. Plant populations (plants/acre) and row length required for 1/1000th of an acre at different row spacings.

Plant(s) per foot	Row Spacing (Inches)			
	30	36	38	40
1	17,424	14,520	13,756	13,068
1.5	26,136	21,780	20,634	19,602
2	34,848	29,040	27,512	26,136
2.5	43,560	36,300	34,389	32,670
3	52,272	43,560	41,267	39,204
3.5	60,984	50,820	48,145	45,738
4	69,696	58,080	55,023	52,272
4.5	78,408	65,340	61,901	58,806
5	87,120	72,600	68,779	65,340
	Length Of Row Needed For 1/1000 th Method			
	17 ft 5 inches	14 ft 6 inches	13 ft 9 inches	13 ft 8 inches

Raper, T., Cochran, A., and Kelly, H. 2019. Making the cotton replant decision. The University of Tennessee. <https://news.utcropt.com/2019/05/making-the-cotton-replant-decision/>

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The condition of the crop and the growing conditions determine whether the remaining stand can recover. Plants cut off below the cotyledons will not survive. Those with deep stem bruises may not recover. Plants that lost terminals but have viable buds may survive. Plants with viable stems, having whole leaves or even portions of damaged leaves, have a good chance of surviving. Poor weather conditions (cloudy, cool, wet) can cause damaged or diseased plants to deteriorate rapidly, even after the weather turns hot and sunny.

Growers should dig plants and examine roots and stems to determine viability. Black, water-soaked tap roots indicate that disease is present. If the tap root is still intact and the outer covering has hardened, recovery potential is improved. If further disease damage is evident, the stem can be cut lengthwise to check for discoloration in the vascular tissues. Wet weather (Ascochyta) blight, as well as other disease organisms, may invade the damaged vascular system. If the weather forecast remains marginal, it is best to assume that only the healthiest plants will survive.

Delaying the evaluation for two to three days of good growing conditions after the initial damage can provide a better indication of how many plants are likely to survive. Cotton has an incredible ability to recover from adverse conditions, so the final judgment on the extent of damage should include crop and growing conditions.

Understanding Why the Stand is Low

Evaluating the condition of the crop can help provide information about why the stand is lower than expected. **Diseased or insect-damaged seedlings** can indicate environmental conditions conducive for damage or a failed pest management program. A **hail event** can lead to damaged or lost cotyledons, bruised stems, and split terminals. Yield potential can be reduced by about 35% when both cotyledons and the terminal are damaged, assuming plant survival.³

Deer-damaged terminals can lower yield potential by around 25 to 30%, with four- to six-leaf cotton having more potential for loss compared to two- to three-leaf cotton.⁴

Soil crusting or compaction can prevent emergence, especially in fields with clay soils drying out after a heavy rain. An early indication of soil crusting is observing swollen seedling hypocotyls near the soil surface. Light crust busting or rotary hoeing may be necessary to alleviate crusting. These practices must be completed quickly and carefully to increase the chance of an optimal stand.³ **Marginal soil moisture** can lead to stand establishment failure, especially when followed by dry conditions. Planting deeper to plant into moisture can also lead to lower-than-expected stands. Observing a pattern in the field where germination is great in some rows and poor in others is most likely due to **equipment**. The planter could have been planting a row too deep, or a nozzle was clogged on the sprayer.

Herbicide applications can injure seedlings, especially after a heavy rainfall. Typically, after three to four weeks, cotton seedlings can grow out of the damage without a substantial loss to yield potential. However, it is important to limit any additional stress to the crop to help maintain yield potential.⁵



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Making the Decision to Replant

There are three options available when considering replanting cotton: keep the stand, kill the stand and replant, or replant low-population areas of a field. Here are several factors to consider when deciding:

Probability of a better stand. If planting conditions have not improved since the first planting, then the likelihood of a better outcome for a replant is low.³

Calendar date. Planting later than the recommended window can limit heat unit accumulation and push boll production into periods of heavy insect pressure and risk freeze damage.² This can result in reduced fiber quality, delayed harvest, increased harvest costs, and lower yields.

Costs to replant. Seed costs, fuel, equipment wear, labor, and any pesticide application expenses can limit profitability on a replant. In some replant situations, seed and technology fees may be refunded. Also consider crop insurance coverage, farm program options, and the potential for planting an alternative crop.

Availability of seed. An earlier-maturing variety can help with a shortened growing season, and availability of a selected variety can be limited. Switching to a different crop may be a possibility for certain situations.

Previously applied herbicides. Fields with previously applied herbicides may require additional management consideration when making replant decisions. It may be necessary to push off the top of the seedbed to remove potentially high concentrations of preemergence herbicides applied with the first planting. Some herbicide programs may have plant-back restrictions that can prevent or complicate a replant.

Large skips. Depending on the condition and uniformity of the stand, it may be possible to fill in skips by replanting portions of the field. This is only recommended if performed within 14 days of the original planting date to reduce management problems later in the season. Plants with different ages can complicate pest management, harvest aid timing, and harvest. Any new cotton varieties that are planted should be selected with similar growth habits, maturity, and herbicide technology as those of the first planting.

Managing the Crop

Harvest timing for the original crop may be delayed waiting for second- and third-position bolls to open. Limiting stress on the crop is important so the plants can focus energy on boll production and maturation.

Replanting the field begins with a burndown herbicide application on the previous planting to prevent competition with the replanted crop. An earlier-maturing variety should be selected to help manage for earliness. Seeding rates should be slightly increased and planted shallow.³ Fertility levels may need to be adjusted along with irrigation scheduling, and managing for earliness. Closely monitor pest pressure and crop growth and make timely insecticide and PGR applications.

Management strategies should be altered and fine-tuned to match the remaining growing season.

For either situation, it is important to establish a realistic yield goal. A low stand or a replant will need to be managed for earliness and protected to retain the bolls produced.² There may not be enough time or heat units available to make up for lost fruiting positions.



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Sources

¹Edmisten, K. and Collins, G. 2024. Planting decisions. NC State Extension. 2024 Cotton Information. <https://content.ces.ncsu.edu/cotton-information/planting-decisions/>

²Raper, T., Cochran, A., and Kelly, H. 2019. Making the cotton replant decision. The University of Tennessee, UTCrops News Blog. <https://news.utcrops.com/2019/05/making-the-cotton-replant-decision/>

³Collins, G. and Edmisten, K. 2019. Late planting and evaluating hail damage. NC State Extension. <https://cotton.ces.ncsu.edu/2019/06/late-planting-evaluating-hail-damage-collins-edmisten/>

⁴Collins, G. and Edmisten, K. 2018. Evaluating and managing deer-damaged cotton. NC State Extension. <https://cotton.ces.ncsu.edu/2018/04/evaluating-and-managing-deer-damaged-cotton-collins-edmisten/>

⁵Li, S. 2017. Herbicide injury on crop caused by excessive rainfall. Alabama Cooperative Extension System. <https://ssl.acesag.auburn.edu/anr/crops/alaweeds/documents/HerbicideDamageUnderExcessiveRainfall.pdf>

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.

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