agKnowledge Spotlight

Shedding light on the concerns of your fields.

DELTAPINE®

Cotton Planting Populations and Row Spacing

- Striving to produce a top-yielding cotton crop begins with management planning. Determining a row width and planting population that is the best fit for cotton production can help maximize yield potential within a field.
- Cotton is typically planted in wider 38- or 40-inch rows; however, narrower row spacing may provide yield benefits under ideal growing conditions.
- When planting in 30-inch 2:1 skip rows, the plant population within each row must be increased to fill in for the skip rows.

Planting Population/Seeding Rate

Proper spacing of cotton plants can help maximize yield potential. Planting cotton seed at too high of a population can cause overcrowding of plants and may unnecessarily increase seed cost. A final stand of 2.5 plants per row foot will typically help maximize yield potential.

High plant populations should be avoided unless very aggressive management practices are to be used in combination with proper variety selection. When cotton plant populations are too high, the following can occur:

- Later initiation of fruiting with a somewhat shortened boll loading period due to running out of time at the end of the season.
- Decreased drought tolerance.
- Increased fruit shedding due to difficult to control plants during the mid to late season.
- Increased need for more aggressive PGR use during the cropping season.
- Increased number of small bolls.

Plant populations that are too low can also reduce yield potential. Reduced cotton stands can:

- Increase plant size.
- Delay reproductive development. Low populations typically fruit earlier but require time to accumulate a fruit load that allows for optimal yield. All of this takes time, which may or may not be beneficial, and can add management challenges in late planting and short-season scenarios.
- Shift more bolls to outer fruiting branches and vegetative branches.
- Increase boll size and micronaire at some fruiting positions.

Local Considerations

Several local conditions can influence the need to adjust cotton planting populations depending on management system/style, variety characteristics, projected weather patterns, and planting date. Some of these specific conditions include:

Early planting. A challenge of early planting is often on the ability to establish and maintain an adequate stand in the face of seedling disease, cold weather, and generally difficult establishment conditions. In the case of early planting into adverse conditions, populations should be increased to compensate for potential losses.

Late planting and/or dryland production. This scenario includes any case where earliness is at a premium. Cotton planted behind wheat or in the last quarter of the planting cycle falls generally into this category. In cases where earliness is required, planting higher populations, in combination with aggressive in-crop management can help make the crop earlier while maintaining adequate yield potential. Having more plants in the field allows a relatively high level of yield accumulation in shorter periods of time as compared to less dense stands. This ultimately allows for an earlier crop to be harvested.

Planting on "growthy" soil types. Highly productive soils that have demonstrated the need for aggressive growth control in the past can often benefit from decreasing the planting populations versus the previous experience. Fewer plants generate less competition for resources and thereby usually require less growth control.

High input, high yield environments. These production environments require the most aggressive decision making, management inputs, and carry somewhat higher risk. In this scenario, we generally plant populations that are ablove average for a region. These fields are typically irrigated and are very aggressively managed with PGRs, fertility, and irrigation applications. These factors influence the likely outcome of a crop in any field, but in this environment, having relatively high numbers of surviving plants establishes the yield potential early in the season. It also carries somewhat more risk but can be managed if those risks are acknowledged up front starting with planting rates and continuing with in-season management decisions.

Setting a target final stand can be accomplished by figuring a targeted seed per foot or plants per acre. Seeding rates can be adjusted by slightly lowering them as the weather conditions and

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forecast move toward the ideal, which can be achieved under irrigation and high temperatures.

Table 1. Seed drop rates for desired plants per foot of row.

Row Width	2 seed/ft	2.5 seed/ft	3 seed/ft	4 seed/ft
30-inch	35,000	43,500	52,000	70,000
36-inch	29,000	36,000	43,500	58,000
38-inch	27,500	34,500	41,000	55,000
40-inch	26,000	33,000	39,000	52,000

Row Spacing

Cotton is typically raised in 38- or 40-inch raised beds in many southern regions; however, some growers plant in narrower 30-inch, 2:1 skip rows. A narrow row planting system allows the use of the same 30-inch planter for cotton, corn, soybean, and other row crops.

Some row spacing research indicates that narrowing row width to 30-inches can increase yield potential. Closer row spacing can help the crop canopy close early in the season. Earlier canopy closure in 30-inch rows may help the cotton crop mature a few days earlier than cotton grown in 38-inch rows. Narrow row spacing can also be more efficient in the use of solar radiation for the photosynthesis process. Cotton grown in narrow rows may require more intensive management as the plants can demand increased nutrients and may produce more vegetative growth, potentially requiring additional plant growth regulator applications.

Tips for 2:1 Skip Row Configurations

- Skip-row planting may allow for better light penetration before canopy closure.
- Skip-row planting can help manage aggessive growth.
- Skip-row planting may provide some level of moisture conservation advantage over solid row cotton.
- By adopting 2:1 skip row spacing, seed and technology costs will not be saved as most or all of the seed that would have been planted in the skipped row should be evenly distributed in the planted rows.
- Carefully read planter manuals to determine settings to achieve the desired population per acre of land, not per planted acre.
- Since cotton plants will eventually fill the skipped row, all over-the-top applications from mid-to-late-season, should be calculated as if the cotton were planted in solid rows.
- Particular care should be taken to keep the skipped row weed free until canopy closure.

All decisions going into planning any cotton production system are highly variable and production practice-specific including the variety planted, population, and in-season management of inputs.

Overall, similar yields can be expected from either 38-inch solid rows or 30-inch 2:1 skip rows, as long as management decisions are made to optimize conditions for that row configuration: uniform seed spacing/placement, adequate bed preparation, and clear middles to allow irrigation and drainage. When selecting cotton varieties for skip row configurations, consider using indeterminate cotton products that produce more vegetative growth and spread and fill in the "skip" area.

Planting cotton in a skip row configuration tends to result in plants with more fruiting positions per node and higher fruit retention. This is primarily a result of increased light penetration in the canopy.

Cotton planted in 2:1 skip row configurations should have plant populations (per field acre, not acre of row feet) in the same range as solid planted cotton. The seed that would have been planted in the skipped rows should be planted in the remaining rows to achieve an acceptable plant population for optimum yield potential.

Sources

[1]Collins, G. 2015. Seeding rates and plant populations. North Carolina State Extension. https://cotton.ces.ncsu.edu/. [2]Cotton variety by populations: Response in 2:1 skip-row planting. Monsanto Learning Center Summary at Scott, MS. 2012. [3]Two-in-one skip row cotton evaluations. Monsanto Learning Center Summary at Scott, MS. 2011. [4]Cotton tillage and planting guidelines. University of Missouri Extension. http://extension.missouri.edu. G4270. [5]Cotton production in Mississippi: What final live plant population should I target. Mississippi State University. http://msucares.com/. [6]Cotton Management Guide. 2013. Deltapine. https://www.aganytime.com/deltapine/tools/Documents/CottonManagementGuide_022614.pdf. Web sources verified 02/24/17. 140311013724