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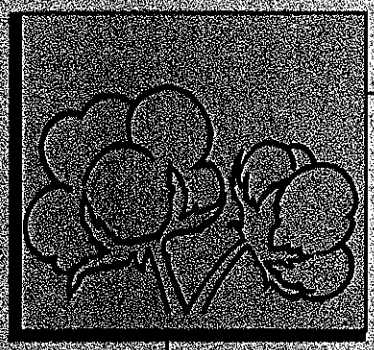
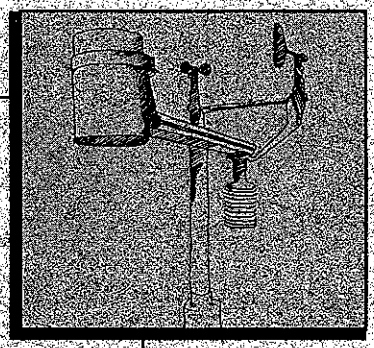
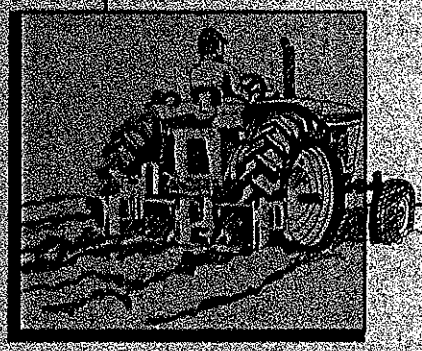
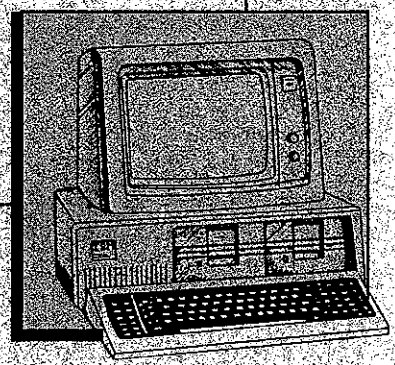
Analyses of the Effects of WEATHER FACTORS On Predicted Cotton Growth & Yield









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MISSISSIPPI AGRICULTURAL & FORESTRY EXPERIMENT STATION Verner G. Hurt, Director Mississippi State, MS 39762
Donald W. Zacharias, President Mississippi State University R. Rodney Foil, Vice President

Analyses of the Effects of Weather Factors on Predicted Cotton Growth and Yield

Xiaoyuan Wang
Graduate Research Assistant
Department of Plant and Soil Sciences

Frank D. Whisler
Professor of Soil Physics
Department of Plant and Soil Sciences

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Analyses of the Effects of Weather Factors on Predicted Cotton Growth and Yield

Abstract

For many years, the National Oceanic and Atmospheric Administration (NOAA) has maintained a weather station at the Delta Branch Experiment Station, Stoneville, MS, near the geographic center of the Mississippi River Delta. Twenty-eight years (1965-1992) of weather observations from that site have been converted into GOSSYM (a cotton crop simulation model) format. Each year, from April 1 through December 31, each week's daily average, maximum, and minimum temperature, solar radiation, rainfall, and wind run were calculated. The averages of each week for the entire 28-year period were also calculated, as were the deviations from average for each specific week of each year. Files were put together so that the daily maximum temperature for each week was close to average, or 1%, 5%, or 10% below or above average, (-10%, -5%, -1%, average, +1%, +5%, +10%), yielding seven sets of files for maximum temperature. The deviations of the other four weather variables were calculated and recorded. The same procedures were followed for minimum temperature. For solar radiation and wind run, the deviations chosen were -50%, -25%, -10%, average, +10%, +25%, and +50%. For rainfall, it was -1.0, -0.5, -0.25, average, +1.0, +2.0, and +3.0 inches of measured rain. Thus, 35 different weather files were generated in order to include the natural covariance of these weather variables and not rely on a statistically fit relationship, such as is done by weather-generating models. GOSSYM was run using these weather files with two soils, two cotton varieties, two row spacings, two plant populations, and three emergence dates typical of the Delta region. All other cultural practices and initial soil conditions were held the same. No plant growth regulators or crop termination chemicals were assumed to be used. Plant height, number of mainstem nodes, date of first square, first bloom, first open boll, first water stress (if any), first nitrogen stress (if any), and final yield were recorded. In general, row spacing, plant population, and date of emergence variations gave inconsistent results in terms of yield. The cotton crops simulated on the Dubbs sandy loam soil consistently yielded more than those simulated on the Sharkey silty clay loam soil, and the midseason (MID) variety outyielded DES 119 in most situations. The other recorded observations were similar. The weather files where maximum temperature was -1%, minimum temperature was 0 to -5%, solar radiation was -10%, wind run was -10% or +25%, and rainfall was +1.0 inch, gave the highest yields when pooled over row spacing, plant population, and emergence date. The crop growing season was divided into four stages. The model was then run where the normal or average weather parameter files were used for all but one stage, and a deviation file was used for that stage. This was done in order to analyze the model for critical growth stages. The model's response was variable, depending upon the weather parameter and the growth stage.

Introduction

The crop simulation models for cotton, GOSSYM (Baker, et al., 1983); soybean, GLYCIM (Acock et al., 1985); and wheat, WINTERWHEAT (Baker et al., 1980) require weather, soil, and cultural practices information in order to run. For each day of the simulation, the weather data requirements are maximum and minimum temperature, solar radiation, rainfall, and wind run. It has been shown that these models are most sensitive to deviations from normal in temperature, somewhat less sensitive to deviations in solar radiation and rainfall, and least sensitive to wind run (Whisler et. al., 1986).

When the crop simulation models are used in "real" time by growers to make management decisions, two types of weather data are needed, actual and future. The actual data are the recorded daily values of each variable from the day of the start of the simulation until yesterday. The future weather is the same kind of weather record from today until the end of the season. Usually, for future weather, the grower uses weather recorded in his area by NOAA and made available through the Cooperative Extension Service or the GOSSYM/COMAX Information Unit (GCIU), or uses his own previous years' weather records. The grower selects the future weather year based upon his experience of weather at that site and any estimations he might have available as to the long-term weather variation for the rest of the crop year (i.e., it's going to be cool and wet, hot and dry, normal, etc.).

These weather variables are covariant or are not independent of one another. For example, on a rainy day in June, there is less solar radiation than on a sunny day, generally lower maximum temperature than on a sunny day, and probably more wind than on a calm, sunny day. However, the converse is not always true. For example, if there is less solar radiation, lower maximum temperature, and higher than normal wind at a particular location, it doesn't mean it rained. Many times we have "cold fronts" pass through without any precipitation. If one were to use a statistical relationship to relate one weather variable or more than one to another, such as temperature to rainfall or temperature and rainfall to solar radiation, the statistical covariance would be built into such a relationship and the exceptions noted above would be lost. Thus, our approach is to use real, complete (i.e., all variables) weather data where possible to test crop simulation models.

Fortunately, most NOAA first-order weather stations collect and record the needed data. Also, most

users of these crop simulation models (McKinion et. al., 1989) have their own automated weather stations that collect and store these data in a computer modem-accessible file. Thus, many long-term GOSSYM/COMAX users are building their own weather archives to use as future weather files.

This study was intended to evaluate how sensitive GOSSYM/COMAX is to known changes or deviations from normal of the weather variables. Furthermore, we wanted to use these deviations of weather to evaluate different possible management practices and the predicted outcome in terms of crop responses.

Methods

Daily weather records from 1965-1992 collected at the NOAA weather station at Stoneville, MS, were put into GOSSYM/COMAX format (Department of Computer Services, Mississippi Cooperative Extension Service). Since rainfall is so erratic and sparse in the summer in Mississippi, we chose to group our calculations by weeks, i.e. look at the daily averages by weeks, rather than by individual days. Also, since cotton grown in Mississippi is not planted before April 1, we started the calculations for each year on that date and went by 7-day periods.

For each week, each year, and each weather variable except rainfall, we calculated the average daily value for that variable. For rainfall, we summed the total weekly value for each year. We then calculated the average value for that week over the 28-year period. For each weather variable, we built seven files. In one file, we placed weeks from April 1 to December 31 that were closest to the average for that variable over all 28 years. If two or more weeks from different years had the same average value for that variable to the second decimal, we chose the first week.

When the entire file was completed (i.e., from April 1 through December 31), we calculated the average deviations of the other weather variables over the whole year. An example of such a file and deviations of each variable from normal are shown in Appendix I, Table 1. For an example of how these calculations were performed, see Appendix II. For maximum and minimum temperatures, we also built files that were -10%, -5%, -1%, +1%, +5%, and +10% below or above normal. The deviations of each of the other variables in these files were calculated as above. The values of these deviations for each of the maximum temperature files, as well as for all other files, are shown in Appendix I, Table 2. For solar radiation and wind run, we built files that were -50%, -25%, -10%, +10%, +25%, and +50% below or above normal from April 1 through December 31. For rainfall, the deviations were chosen in inches of rainfall for the week from normal. Files were made for -1.0, -0.5, -0.25, +1.0, +2.0, and +3.0 inches of rainfall for the week. Again, if there were more than one choice of a week from the 28 years recorded, we chose the earliest one. Thus, 35 weather files were built.

In order to use these weather files as a grower might use them, we selected several options of some of the other input variables in kind of "what if" games. We used two variety files, MID and DES 119; two row spacings, 30 and 38 inches; two plant populations, two and four plants per foot of row; two soils, Dubbs sandy loam and Sharkey silty clay loam (from the Hester farm in Bolivar County, MS., and Dubbs 7 and Sharkey 8 in the GOSSYM/COMAX soil files); and three emergence dates, May 1, May 15, and June 1.

We used the same initial soil file and cultural practices file on all runs. We did not use any plant growth regulator chemicals or crop termination chemicals. We terminated the runs when all bolls were open or November 1, whichever came first. Two studies were conducted: (1) the same assembled weather file was used for the whole season; (2) the average weather file was used in all but one critical growth stage; and, in this stage, another deviant file was used. These were all used as actual weather files for the whole season.

Results and Discussion

Graphs of the average maximum and minimum temperatures, solar radiation, rainfall, and wind run are shown in Figures 1-3. These show the natural day-to-day variation of each of these variables for the weeks starting April 1-December 31. Each pattern would be expected to apply only to the Midsouth, but other regions of the Cotton Belt would have their own distinctive patterns of variation. Having these day-to-day variations in the weather files is important when using mechanistic crop growth models. Crop

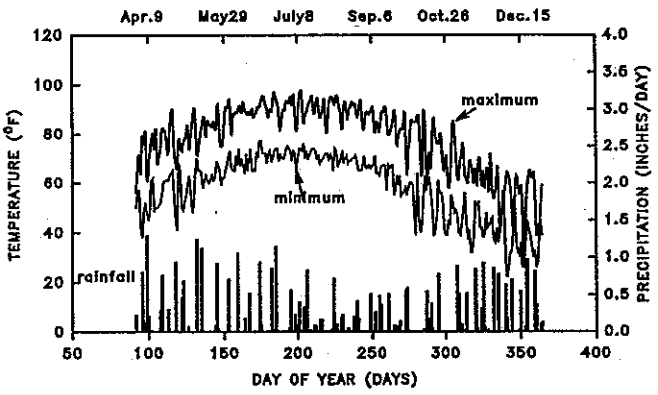

Figure 1. The distribution of daily maximum and minimum temperature and precipitation for each average week (28 years) at Stoneville, MS.

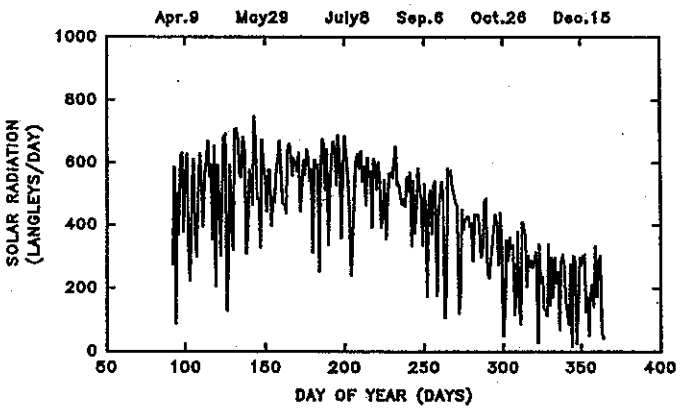

Figure 2. The distribution of daily solar radiation for each average week (28 years) at Stoneville, MS.

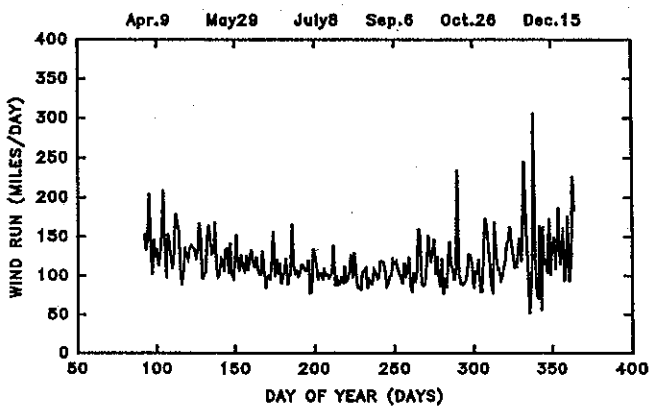

Figure 3. The distribution of daily wind run for each average week (28 years) at Stoneville, MS.

stresses for photosynthate, nitrogen, and water are calculated from such data and are used in the models to realistically change growth patterns and organ retention. Statistically averaged data (that is using daily average temperatures, solar radiation, rainfall, and wind run for a week or a month) would not produce these variations, and thus would not produce realistic stresses in such models nor predict realistic plant growth.

For the grower who is using GOSSYM/COMAX for preseason management decisions, Table 1 shows the level of detail that is necessary to aid in making those decisions. (Similar tables for all other variations of the weather variables are Appendix I Tables 3-36.)

In Table 1, predicted yields are generally higher on the Dubbs soil than the Sharkey soil and for the MID variety than the DES 119 variety. In general, in this table, the June 1 emergence date outyielded the May 15 emergence date, which in turn outyielded the May 1 emergence date. In many cases, the higher-yielding crops were predicted to be shorter than the lower-yielding crops.

The number of mainstem nodes generally followed the yield pattern, with the later-emergence-date crops having more nodes than the earlier-emergence-date crops. In general, the dates of first square and first bloom (when half of the plants are expected to have a square or one bloom) are telescoped with dates of emergence (i.e., while the dates of emergence are 15 days apart, the dates of first square and first bloom are less than 15 days apart). This was not always true for dates of first open boll and maturity.

The 30-inch rows were generally predicted to outyield the 38-inch rows, and the two plants per foot of row were generally predicted to outyield the four plants per foot of row. In other conditions (other tables), these general observations may not hold.

While the predictions for these specific conditions may hold true, there are other considerations. For example, in Table 1, the highest predicted yield is 2.39 bales/acre (B/A) for 30-inch rows, two plants per foot of row emerging on June 1 for a MID variety on a Dubbs soil. However, on November 1, when the simulation was terminated, the footnote indicates that there were several green bolls remaining on the plant. This is very late for Mississippi harvesting conditions. Therefore, 1.58 B/A from a crop in 30-inch rows, four plants per foot of row, emerging May 15, and harvested about September 29, might be a more profitable and a more realistic crop under these expected weather conditions.

A grower may want to use this approach in his/her own analyses but with other emergence dates, row spacings, plant populations, etc. We would encourage such usage. In the back of this bulletin is a blank copy of the form used in Table 1. Anyone may copy it for their own use.

Maximum Temperature

Figure 4 clearly shows the trends of cotton yields with the effects of maximum temperature for both Sharkey 8 and Dubbs 7 soils and MID and DES 119 varieties. Each line represents the average of all row spacings, plant populations, and emergence dates, (12 simulations). With only one exception, the maximum yields were for –1% deviation of maximum temperature. That exception was –5% deviation of maximum temperature for the DES 119 variety in the Sharkey soil. The yields decline sharply for temperature, both below and above these optimum values. There is a slight, unexpected rebound in yield predicted between normal and +1% increase in maximum temperature but more declines at higher temperatures. The rebound probably was due to the

interactions of other weather variables in these weather files. For example, at +1% maximum temperature, the rainfall was 0.30 inch above normal, Appendix I, Table 2, which produced higher yields.

Analyses, such as shown in Figure 4, have been combined into an analysis of critical cotton growth stages. In these analyses, we divided the period into four growth stages, **(A) seedling** – from emergence to first square, **(B) vegetative** – from first square to first bloom, **(C) floral** – from first bloom to first open boll, and **(D) maturation** – from first open boll to maturity. Each of these stages is about 30 days long.

We then ran the simulations for the Sharkey soil, for 30-inch rows, two plants per foot of row, and a May 1 emergence date for both varieties where the maximum temperature was normal for all except the specific growth stages, and that used the –10% deviation of maximum temperature.

Table 1. Predicted cotton responses using average maximum temperature for three emergence dates, two row spacings, and two plant populations. Deviations of the other weather variables are shown in Appendix I, Tables I-3 through I-36.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	ROW SPACING (inches)				ROW SPACING (inches)				ROW SPACING (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.72	0.72	0.66	0.60	0.77	0.79	0.74	0.70	1.08	1.01	0.95	0.89
MD	9/15	9/06	9/14	9/10	9/26	9/21	10/04	9/21	10/29	10/12	10/31	10/22
PHT	24.2	22.6	26.4	24.2	23.8	22.8	25.3	24.6	22.6	22.4	25.7	25.0
NN	19	17	19	17	19	17	20	18	21	20	22	20
FS	6/03	6/03	6/03	6/03	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/13	8/13	8/13	8/13	8/24	8/24	8/24	8/24	9/08	9/08	9/08	9/08
SO.	Sha.8											
VAR	Mid											
YLD	0.51	0.50	0.45	0.48	0.58	0.48	0.55	0.48	0.69	0.61	0.57	0.50
MD	9/13	9/06	9/15	9/08	9/29	9/22	10/06	9/23	10/29	10/24	11/01	10/27
PHT	33.0	31.2	35.5	34.1	32.6	30.5	34.1	33.1	28.9	27.8	31.4	30.8
NN	20	18	20	18	19	17	19	18	19	18	19	18
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/24	6/24	6/24	6/24
FB	6/27	6/27	6/27	6/27	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/13	8/13	8/13	8/13	8/25	8/25	8/25	8/25	9/08	9/08	9/08	9/08
SO.	Sha.8											
VAR	De119											
YLD	1.56	1.48	1.55	1.38	1.87	1.58	1.96*	1.47	2.39*	2.37	2.28*	2.11*
MD	9/23	9/14	10/05	9/16	10/30	9/29	11/01	10/09	11/01	11/01	11/01	11/01
PHT	36.5	31.0	36.0	31.9	31.0	28.5	33.8	30.2	33.1	29.6	38.3	31.8
NN	22	19	21	19	22	19	23	20	24	22	26	22
FS	6/03	6/03	6/03	6/03	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/14	8/14	8/14	8/14	8/24	8/24	8/24	8/24	9/08	9/08	9/08	9/08
SO.	Dub.7											
VAR	Mid											
YLD	1.12	1.06	1.20	1.09	1.23	1.09	1.39	1.13	1.64*	1.39	1.69*	1.57
MD	9/21	9/13	9/27	9/15	10/19	9/28	10/28	9/30	11/01	10/29	11/01	11/01
PHT	50.3	45.9	55.7	47.1	43.7	41.1	46.2	41.8	41.7	37.2	45.0	40.7
NN	21	19	23	20	22	19	23	20	22	20	22	20
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/24	6/24	6/24	6/24
FB	6/27	6/27	6/27	6/27	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/13	8/13	8/13	8/13	8/25	8/25	8/25	8/25	9/08	9/08	9/08	9/08
SO.	Dub.7											
VAR	De119											

CROP-Cotton
ED-Emergence Date (month/day)
RS-Row spacing (inches)
PPF-Plants per foot of row
YLD-Yield (bales/acre)
MD-Maturity date
PHT-Plant height (inches)
NN-Number of nodes
FOB-First open boll
FS-First square
FB-First bloom
SO.-Soil
VAR-Variety
*-Several green bolls at final yield
Mid-midseason variety
De119-DES 119
Sha.8-Sharkey 8
Dub.7-Dubbs 7
Actual weather: tmax00.act
Future weather: tmax00.nor

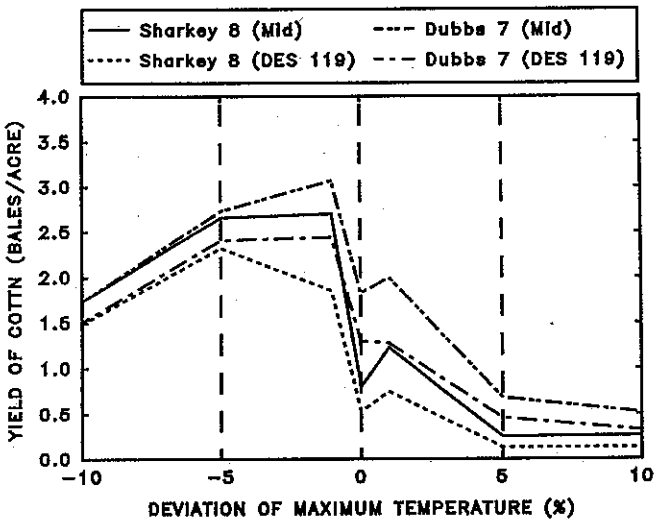

Figure 4. The yield responses of cotton to variations of maximum temperature.

This involved making several runs with the model. For example, if we were testing the effect of a change of temperature in the (B) stage of cotton development, we would look at the output of the run with the normal temperatures to get a first estimate of the dates to use for the -10% deviation of temperature. Then, using an actual average weather file that had been edited to include the -10% deviation of temperature for those dates, another run was made. If there was little change (only ± 1 day), that run was accepted and the results used. If, however, there was more than a 1 day change in the first bloom date, a new, edited weather file would be made to include those extra -10% deviation of temperature days and the run would be repeated. Again, this process might have to be repeated before there was no change in the simulated first flowering dates. The other growth stages and weather variables were treated similarly. The results are shown in Table 2.

The most sensitive stage of development was (D) the maturation stage. For example, if it is abnormally cold during this stage, the bolls will not fill. The plants will also be shorter than if the cold temperatures occurred in the other stages.

The next most affected stage was (B) the vegetative stage. Yields were predicted to be somewhat decreased, the plants slightly shorter and the time from first square to first bloom was one week longer.

The least affected stage was (C) the floral stage. Recalling Figure 4, where maximum yield was predicted to occur at less than normal temperatures, this indicates that more fruiting sites were retained or not aborted. This observation is in line with the studies of Hodges, et al. (1992), Reddy, et al. (1992), and Reddy et al. (1993).

For both the (A) and (B) periods of critical temperatures, a water stress was predicted near mid-July. This would be about the time when plant growth would be very rapid, roots would be expanding, and soil stored moisture near the soil surface would be depleted.

Table 2. The comparison of yield trends of cotton with -10% deviation below the mean maximum temperature during each different critical growth stages (A, B, C, and D) and with mean maximum temperature during whole season (O) (Bales/Acre). *

VARIETY	MID					DES 119				
GSLMTO	A	B	C	D	O	A	B	C	D	O
DV:-10%										
YLD	1.56	1.03	2.61	0.75	0.72	0.95	0.80	1.27	0.51	0.51
MD	10/04	10/04	10/14	10/08	9/15	10/06	9/25	10/04	10/06	9/13
PHT	35.4	29.1	39.4	24.0	24.2	50.6	38.3	47.7	32.2	33.0
NN	22	21	26	19	19	20	20	25	19	20
FS	6/12	6/03	6/03	6/03	6/03	6/10	6/02	6/02	6/02	6/02
FB	7/05	7/04	6/27	6/27	6/27	7/05	7/04	6/27	6/27	6/27
FOB	8/23	8/21	8/27	8/13	8/13	8/22	8/21	8/26	8/13	8/13
DFWS	7/12	7/05	9/06			7/11	7/06			

GSLMTO: Growth stage when low maximum temperature occurred;
YLD: Yield (bales/acre); MD: Maturity date (month/day);
PHT: Plant height (inches); NN: number of nodes;
FS: First square; FB: First bloom; FOB: First open boll;
DFWS: Date of first water stress. DV: Deviation

* Practice options and weather inputs:
Emergence date: 5/01; Plants per foot of row: 2;
Row spacing: 30 (inches); Soil type: Sharkey 8;
Varieties: Midseason (Mid); DES 119;
Tmax00.nor as mean maximum temperature; Tmaxm10.cld as a decrease of 10% below the mean.

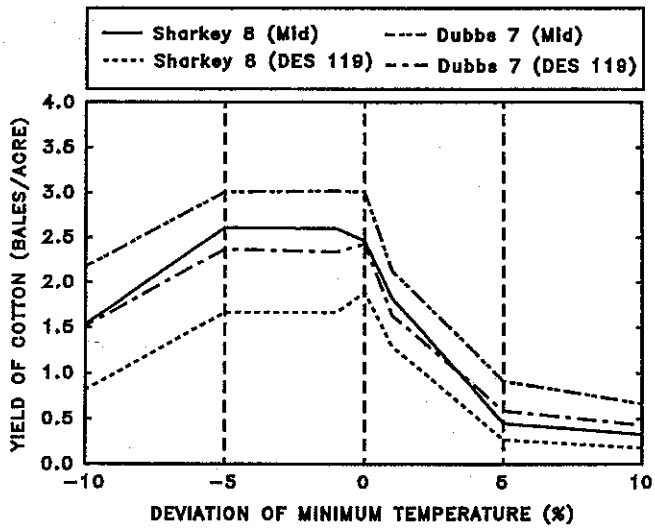

Figure 5. The yield responses of cotton to variations of minimum temperature.

Minimum Temperature

The results of the simulations for the minimum temperature are shown in Figure 5. As in Figure 4, the maximum predicted yields are at -1% deviation from normal for the MID variety, but at normal or average minimum temperatures for the DES 119 variety. The shapes of the curves or relationships for each soil are different, but similar for each variety.

A study of the critical growth stages was made using the same periods as before but with the minimum temperature being reduced by 10% during that particular growth stage. The results are shown in Table 3.

The most sensitive stage of development was **(B)** the vegetative stage. If it is abnormally cold during this stage, the squares will abort and the plant will be shorter with fewer nodes. The least critical stage for yield is **(D)** maturation; the bolls have been set and are now filling. However, a cold spell during **(C)** the floral stage for DES 119 will reduce yields but will not delay crop maturity. If there is a cold spell during **(A)** the seedling stage, after it has ceased around June 15, the plants will grow quite rapidly and experience a water stress in early August. However, if that cold spell is in **(C)** the floral stage there is no predicted water stress until mid-September, when overall growth has been slowed but bolls are filling. For the MID variety and low temperatures during either the **(A)** or **(C)** stages, a nitrogen stress was predicted in mid-September. It would not be profitable to try to relieve such a stress since most of the potential boll growth is complete and the stress aids cutout and crop termination.

Solar Radiation

The effects on predicted yields due to variations in solar radiation are shown in Figure 6. The maximum

Table 3. The comparison of yield trends of cotton with -10% deviation below the mean minimum temperature during each different critical growth stages (A, B, C, and D) and with mean minimum temperature during whole season (O) (Bales/Acre).*

VARIETY	MID					DES 119				
GSLMTO	A	B	C	D	O	A	B	C	D	O
DV: -10%										
YLD	2.62	0.90	2.65	2.72	2.53	2.04	0.42	2.05	2.41	2.19
MD	10/23	9/15	10/26	10/19	10/15	10/26	9/17	11/01	10/23	10/21
PHT	49.6	14.1	43.6	47.0	46.8	59.6	19.1	60.2	64.3	63.1
NN	25	16	23	22	23	22	18	23	23	24
FS	6/13	6/04	6/04	6/04	6/04	6/11	6/02	6/02	6/02	6/02
FB	7/07	7/04	6/29	6/29	6/29	7/07	7/04	6/29	6/29	6/29
FOB	8/26	8/21	9/02	8/17	8/17	8/26	8/20	9/01	8/17	8/17
DFWS	8/06	7/05	9/03			8/05	7/06	9/03	8/19	
DFNS	9/15									

GSLMTO: Growth stage when low minimum temperature occurred;
YLD: Yield (bales/acre); MD: Maturity date (month/day);
PHT: Plant height (inches); NN: number of nodes;
FS: First square; FB: First bloom; FOB: First open boll; DV: Deviation;
DFWS: Date of first water stress; DFNS: Date of first nitrogen stress.

* Practice options and weather inputs:
Emergence date: 5/01; Plants per foot of row: 2;
Row spacing: 30 (inches); Soil type: Sharkey 8;
Varieties: Midseason (Mid); DES 119
Tmin00.nor as mean minimum temperature; Tminm10.cld as a decrease of 10% below the mean.

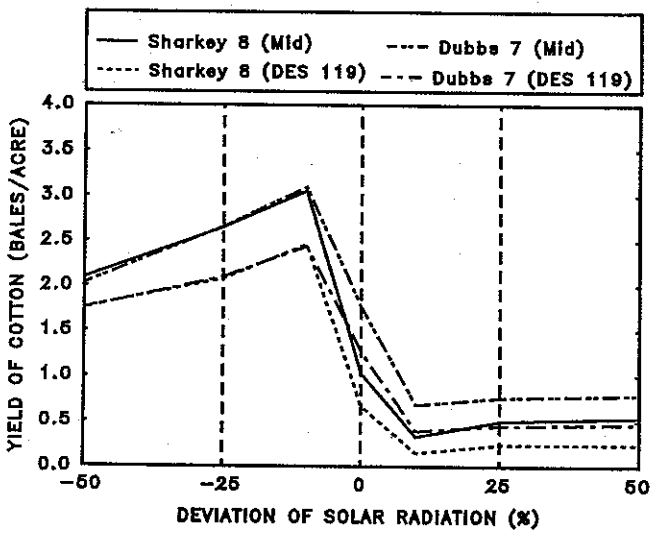

Figure 6. The yield responses of cotton to variations of solar radiation.

yields are at 10% below normal solar radiation with very steep declines in yield below or above this level of radiation, regardless of soil or variety. For solar radiation 5% or greater than normal, there is a leveling out of the yield at less than 1 B/A, because of low rainfall, Appendix I, Table 2.3.

We also conducted a test of critical growth periods as we did with temperatures; however, the solar radiation during the critical period was -25% below normal. The results are shown in Table 4.

The (D) stage was the most critical period. If there was low solar radiation during this maturation period, the bolls did not fill, and plants were shorter than average with fewer nodes. On the other hand, the least affected period was (C) for the MID variety. Fewer bolls may have been retained during this period, but if solar radiation was returned to normal during boll filling, the remaining bolls were heavier and yields higher. Also, with this (C) condition the plants developed a water stress in mid-August, about the end of this period. Low solar radiation during (B) flowering, was also detrimental to yields. As in the temperature study, a reduction in solar radiation during (A) or (B) stages, then a return to normal radiation for the rest of the season, predicted a rapidly growing crop that would experience a water stress in mid-July. Also, for the MID variety, an insignificant nitrogen stress is predicted in early September.

Rainfall

The effects of variations in rainfall on predicted yields are shown in Figure 7. Here, the maximum yields are predicted to be obtained with 1 inch higher than average rainfall. Below or above this amount of rainfall, the yields decline regardless of the soil storage capacity, and could, under the dry conditions, generally use supplemental irrigation.

The effects of rainfall were also tested during critical growth periods and the results are shown in Table 5. The rainfall was -1.0, -0.25, +1.0, and +3.0 inches

Table 4. The comparison of yield trends of cotton with -25% deviation below the mean solar radiation during each different critical growth stages (A, B, C, and D) and with mean solar radiation during whole season (O) (Bales/Acre). *

VARIETY	MID					DES 119				
GSLSRO	A	B	C	D	O	A	B	C	D	O
DV:-25%										
YLD	2.07	1.92	2.31	1.03	0.95	1.66	1.47	1.25	0.69	0.64
MD	9/18	10/01	9/29	9/17	9/10	9/30	9/30	9/19	9/17	9/10
PHT	40.1	39.6	36.0	25.2	24.7	54.2	55.2	41.4	28.3	26.7
NN	23	23	25	21	20	21	22	23	20	19
FS	6/05	6/03	6/02	6/02	6/02	6/03	6/01	6/01	6/01	6/01
FB	6/29	6/28	6/26	6/26	6/26	6/28	6/27	6/26	6/26	6/26
FOB	8/15	8/14	8/16	8/11	8/11	8/14	8/13	8/15	8/11	8/11
DFWS	7/14	7/15	8/12			7/13	7/14	8/12		
DFNS	9/06									

GSLSRO: Growth stage when low solar radiation occurred;
YLD: Yield (bales/acre); MD: Maturity date (month/day);
PHT: Plant height (inches); NN: number of nodes; DV: Deviation
FS: First square; FB: First bloom; FOB: First open boll;
DFWS: Date of first water stress; DFNS: Date of first nitrogen stress.

* Practice options and weather inputs:
Emergence date: 5/01; Plants per foot of row: 2;
Row spacing: 30 (inches); Soil type: Sharkey 8;
Varieties: Midseason (Mid); DES 119
Solar.nor as mean solar radiation; Solarm25.cld as a decrease of 10% below the mean.

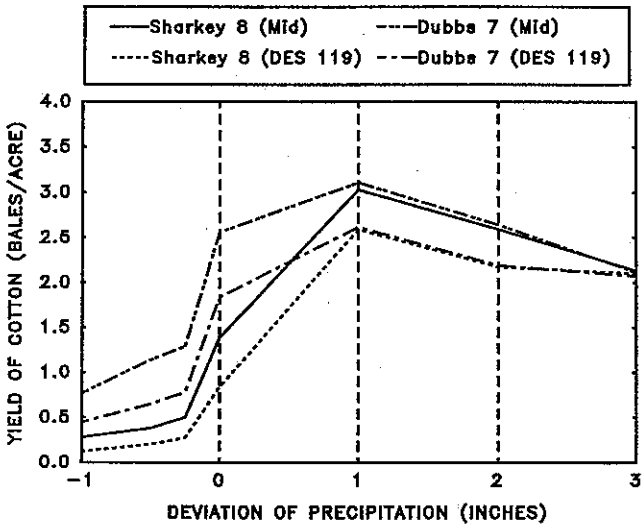

Figure 7. The yield responses of cotton to variations of precipitation.

during the critical stage and normal at all other stages. When rainfall was less than normal by 1 inch (–1.0), the crop was predicted to mature earlier than when the rainfall was 0.25 inch (–0.25) less than normal; usually the plants were shorter and the yield less. However, during the (D) stage, the yields were predicted to be a little higher and plants a little taller for the –1.0-inch rainfall than for the –0.25-inch rainfall.

When rainfall was above normal, the predicted plant heights, yields, and maturation dates were not much different with an increase of 1 or 3 inches during the critical periods. When rainfall was less than normal, the (C) period was the most critical. When the rainfall was above normal, the (D) period seemed to be the most critical since it had the lowest yield. When rainfall was less than normal, the crop was predicted to experience water stress sometime within that period, except during the (D) stage. When rainfall was above normal, the crop was predicted to experience a nitrogen stress sometime in late August, except when the increased rainfall occurred in the (D) stage. This would indicate that some of the nitrate was predicted to leach beyond the root zone and/or the plant still required more nitrogen. (We did not test to see if foliar applied nitrogen at this late date would have eliminated the predicted nitrogen stress.) When rainfall was above normal in either the (A) or (B) stages for either +1 or +3 inches, and additionally in the (C) stage for the +1 inch, there was a predicted water stress after returning to normal rainfall.

Table 5. The comparison of yield trends of cotton with changing precipitation during each different critical growth stages (A, B, C, and D) and with mean precipitation during whole season (O) (Bales/Acre). *

SCENARIO	AAWP–1.0 (inches)					AAWP–0.25 (inches)				
GSL/MPO	A	B	C	D	O	A	B	C	D	O
YLD	0.83	1.15	0.70	1.55	1.55	1.10	1.68	0.67	1.41	1.55
MD	9/14	9/20	9/11	10/01	9/29	9/18	9/25	9/11	9/30	9/29
PHT	20.1	24.2	22.9	28.8	29.1	23.7	30.9	21.3	28.7	29.1
NN	19	21	17	21	21	20	21	16	20	21
FS	6/03	6/02	6/02	6/02	6/02	6/02	6/02	6/02	6/02	6/02
FB	6/27	6/29	6/26	6/26	6/26	6/26	6/26	6/26	6/26	6/26
FOB	8/15	8/18	8/13	8/15	8/15	8/14	8/17	8/10	8/15	8/15
DFWS	6/05	7/01	8/16			6/14	6/29	8/14		

SCENARIO	AAWP+1.0 (inches)					AAWP+3.0 (inches)				
GSL/MPO	A	B	C	D	O	A	B	C	D	O
YLD	2.64	2.27	2.70	1.83	1.55	2.51	2.63	2.90	1.72	1.55
MD	10/10	9/26	10/26	10/05	9/29	10/01	10/14	10/13	9/30	9/29
PHT	41.4	40.5	37.8	30.8	29.1	40.3	44.2	43.1	29.9	29.1
NN	22	23	21	22	21	21	21	21	21	21
FS	6/09	6/02	6/02	6/02	6/02	6/03	6/02	6/02	6/02	6/02
FB	7/02	6/27	6/27	6/26	6/26	6/27	6/28	6/26	6/26	6/26
FOB	8/25	8/17	8/15	8/15	8/15	8/16	8/18	8/17	8/15	8/15
DFWS	7/19	7/12	8/21			6/13	7/29			
DFNS	8/30		8/22			8/23	8/24	8/23		

GSL/MPO: Growth stage when less or more precipitation occurred; AAWP: Average amount of weekly precipitation
YLD: Yield (bales/acre); MD: Maturity date (month/day); PHT: Plant height (inches); NN: number of nodes;
FS: First square; FB: First bloom; FOB: First open boll;
DFWS: Date of first water stress; DFNS: Date of first nitrogen stress.

* Practice options and weather inputs: Emergence date: 5/01; Plants per foot of row: 2;
Row spacing: 30 (inches); Soil type: Sharkey 8; Varieties: Midseason (Mid); Rain00.nor as average amount of weekly rainfall; rainm025.hot or rainm10.hot as 0.25 or 1.0 inches decrease of the mean; Rainp01.cld or rainp03.cld as 1.0 or 3.0 inches increase of the mean.

When the higher rainfall occurs, the model predicts fewer roots being developed. When the extra rainfall stops and the plant is in the floral or later stages of development, fewer new roots can be produced because of intraplant competition with the developing bolls, thus the predicted water stress.

Wind Run

The effects on predicted yields due to variations in wind run are shown in Figure 8. The shapes of the relationships are different than in the previous figures, looking more like "bat wings." There are peak yields predicted at –50%, –10%, and +25% below or above normal and much lower yields at other values of wind deviations.

Since wind run enters into the calculations in the model only for estimations of evapotranspiration, this erratic behavior can only be explained by looking at the variations of the other weather variables for the specific wind run deviation. For average wind run, Appendix I, Table 2.5, the maximum and minimum temperatures were a little (about 1%) above normal, which from Figures 4 and 5 would indicate a reduced yield. For wind runs of –50%, –10%, +25% deviations, the temperatures were about –1% deviations from average, or as seen in Figures 4 and 5 at peak yields.

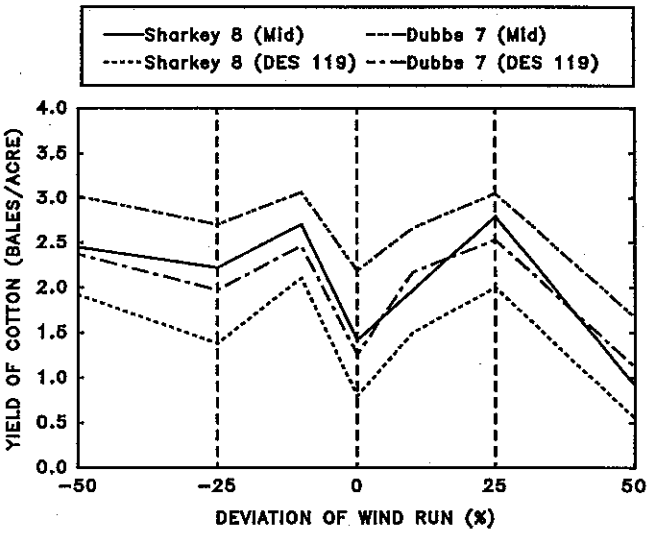

Figure 8. The yield responses of cotton to variations of wind run.

Thus, the three peaks in the wind run graph could be mainly due to optimum temperatures coinciding with the wind run deviations. These results were inadvertent. Covariance in the weather selected for this

Table 6. The comparison of yield trends of cotton with changing wind run during each different critical growth stages (A, B, C, and D) and with mean wind run during whole season (O) (Bales/Acre). *

VARIETY	MID					DES 119				
GSL/MWO	A	B	C	D	O	A	B	C	D	O
DV:–10%										
YLD	1.31	1.38	2.76	1.27	1.35	0.86	0.91	2.30	8/16	0.90
MD	9/21	9/26	10/08	9/17	9/20	9/20	9/20	10/11	0.91	9/20
PHT	32.0	30.4	44.5	31.0	31.9	37.6	39.5	56.0	9/16	40.2
NN	22	21	24	21	22	21	22	25	39.1	22
FS	6/05	6/03	6/03	6/03	6/03	6/04	6/02	6/02	20	6/02
FB	6/29	6/27	6/27	6/27	6/27	6/29	6/27	6/28	6/02	6/28
FOB	8/15	8/13	8/15	8/13	8/13	8/14	8/12	8/16	6/28	8/13
DFWS	6/21	6/22	8/16			6/16	6/22		8/13	
DFNS			9/03							
DV:+50%										
YLD	0.98	1.33	1.16	1.20	1.35	0.71	0.86	0.66	0.88	0.98
MD	9/18	9/264	9/20	10/17	9/20	9/19	9/26	9/15	10/13	9/20
PHT	21.8	30.5	26.4	30.7	31.9	26.5	35.2	30.6	39.3	40.2
NN	22	22	21	20	22	21	20	19	20	22
FS	6/04	6/03	6/03	6/03	6/03	6/03	6/02	6/02	6/02	6/02
FB	6/28	6/27	6/27	6/27	6/27	6/29	6/27	6/28	6/28	6/28
FOB	8/13	8/13	8/13	8/13	8/13	8/14	8/12	8/13	8/13	8/13
DFWS	6/06	6/28	8/14			6/06	6/28	8/14		

GSL/MWO: Growth stage when less or more windrun occurred; YLD: Yield (bales/acre); MD: Maturity date (month/day); PHT: Plant height (inches); NN: number of nodes; FS: First square; FB: First bloom; FOB: First open boll; DFWS: Date of first water stress; DFNS: Date of first nitrogen stress. DV: Deviation

* Practice options and weather inputs:
Emergence date: 5/01; Plants per foot of row: 2; Row spacing: 30 (inches);
Soil type: Sharkey 8; Varieties: Midseason (Mid), DES 119;
Wind00.nor as mean wind run; windm10.hot as a decrease of 10% below the mean; Windp50 as an increase of 50% above the mean.

purpose demonstrates the risk of being misled by a superficial examination of such simulations or by weather data generated by other means. For a wind run 50% above normal, the maximum and minimum temperature deviations were below their peak values, Figures 4 and 5, and thus the predicted yields were much reduced. This again is because of the inadvertent covariance of the selected data.

The wind run was used in a critical growth stage analysis and the results are shown in Table 6. This test was much like the rainfall case where -10% and +50% deviations were used in combination with the normal wind run file.

For the high wind test, the (A) and (C) stages were the most sensitive in terms of yield for both the MID and DES 119 varieties, respectively. The (B) and (D) stages were the least sensitive in terms of yield for the MID and DES 119 varieties, respectively. The (A) stage high wind test had the shortest plants for both varieties and the (D) stage high wind tests had the tallest plants.

With increased wind, the date of first square and first bloom did not change appreciably, regardless of the critical growth stage; however, maturity was delayed when the high wind occurred in the (D) stage. With high wind there was a predicted water stress at the end of the period of high wind except for the (D) stage.

When wind was lower than normal, the (D) and (A) periods were the most sensitive in terms of yield for the MID and DES 119 varieties, respectively. The (C) period was least sensitive in terms of yield for both varieties. Plant height followed the yield responses, having shorter plants with low yield and taller plants with high yield.

Dates of first square and first bloom were not appreciably changed by a decreased wind, and date of maturity was only slightly delayed, probably due to bigger, higher-yielding plants when the wind was decreased in the (C) stage. Water stresses were delayed a few days when compared to the high wind tests, except when the change occurred in the (D) stage. In only one case, the MID variety with the low wind in the (C) stage with large high yielding plants, was there a predicted nitrogen stress.

Conclusions

Long-term weather records can be organized into files with known deviations from normal for usage in crop simulation models. Such files are useful in looking at interactions of crop emergence dates, row spacing, plant populations, varieties, and soils; and users of crop simulation models should be encouraged to use them as future weather files.

The GOSSYM/COMAX cotton crop simulation model is most sensitive to temperatures of the five weather variables used by this model. This study shows that maximum yields are predicted at maximum temperatures 1% below normal. In other words, this suggests that normal temperatures in the Mississippi Delta are too high for optimum cotton production.

We have also seen that the model predicts that optimum yields are predicted to occur at below normal solar radiation levels, but this may be due to the natural covariance of rainfall and temperatures associated with normal levels of radiation. For example, at less than normal levels of radiation, the temperatures are lower and the rainfall is higher than normal; this is the real reason that yields are higher.

This study shows that maximum yields occur at rainfall amounts of 1 inch higher than normal. Thus, supplemented irrigation should be profitable most of the time in cotton production.

The simulated effects of wind on cotton yield are predicted to be erratic and are best explained by looking at the temperature values associated with the particular wind deviation. The results of the wind run tests illustrate inadvertent covariance of the weather variables when using real, historic data.

An examination was also made of cotton growth stages by using a normal weather variable in all but one of the four growth stages. By systematically changing that stage, the maximum response to that variable was identified. The most sensitive growth stage depended upon the weather variable. Except for wind, both cotton varieties responded the same.

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Appendix I

Table I-1. An Example of Daily Weather Inputs with Maximum Air Temperature for Each Average Week and Deviations of Maximum Temperature and Other Associated Weather Variables.

DOY	M/D	Solar	Max.T	Min.T	Rain	Wind
92	'04/01'	604	56	42	1.84	269.33
93	'04/02'	596	66	40	0.00	128.68
94	'04/03'	553	71	45	0.00	94.27
95	'04/04'	528	64	46	0.00	134.67
96	'04/05'	604	79	45	0.00	127.19
97	'04/06'	613	76	47	0.00	142.15
98	'04/07'	502	81	51	0.00	109.23
99	'04/08'	129	63	55	1.74	145.14
100	'04/09'	170	64	58	1.77	115.22
101	'04/10'	545	72	56	0.32	139.16
102	'04/11'	613	77	51	0.00	121.20
103	'04/12'	554	80	53	0.00	115.22
104	'04/13'	239	74	62	0.05	155.62
105	'04/14'	460	82	63	0.05	146.64
106	'04/15'	136	69	59	1.56	176.56
107	'04/16'	110	70	60	0.00	160.10
108	'04/17'	97	73	60	0.75	188.53
109	'04/18'	91	81	62	0.00	172.07
110	'04/19'	88	82	69	0.00	202.00
111	'04/20'	86	81	63	0.00	179.56
112	'04/21'	85	77	66	0.00	128.68
113	'04/22'	716	72	52	0.00	112.10
114	'04/23'	722	81	56	0.00	152.60
115	'04/24'	529	87	62	0.04	186.40
116	'04/25'	710	89	55	0.00	231.30
117	'04/26'	694	73	46	0.00	212.40
118	'04/27'	680	69	41	0.00	137.20
119	'04/28'	688	66	42	0.00	85.70
120	'04/29'	387	77	54	0.00	104.74
121	'04/30'	323	76	58	0.44	71.82
122	'05/01'	323	73	58	0.02	88.28
123	'05/02'	600	76	59	0.08	77.81
124	'05/03'	601	78	55	0.00	71.82
125	'05/04'	658	80	56	0.00	71.82
126	'05/05'	670	83	58	0.02	86.79
127	'05/06'	232	74	62	0.37	146.64
128	'05/07'	592	79	63	0.06	160.10
129	'05/08'	580	84	58	0.00	130.18
130	'05/09'	581	90	64	0.00	94.27
131	'05/10'	418	87	67	0.00	89.78
132	'05/11'	371	73	62	0.43	121.20
133	'05/12'	598	73	54	0.00	109.23
134	'05/13'	679	78	62	0.00	99.60
135	'05/14'	365	82	64	0.00	121.50
136	'05/15'	555	86	73	0.00	210.00
137	'05/16'	410	86	65	0.06	261.10
138	'05/17'	743	79	59	0.00	176.50
139	'05/18'	590	85	60	0.00	150.00
140	'05/19'	351	84	69	0.05	190.20
141	'05/20'	681	84	57	0.00	85.29
142	'05/21'	579	83	62	0.00	146.64
143	'05/22'	400	85	64	0.00	104.74
144	'05/23'	374	82	68	0.00	131.67
145	'05/24'	689	85	57	0.10	181.05
146	'05/25'	681	92	58	0.00	92.77
147	'05/26'	213	80	66	0.00	101.75
148	'05/27'	672	75	59	0.00	131.67
149	'05/28'	681	76	50	0.00	118.21
150	'05/29'	621	82	52	0.00	125.69
151	'05/30'	604	90	57	0.00	101.75
152	'05/31'	417	91	69	0.15	92.77
153	'06/01'	519	92	66	0.00	119.70
154	'06/02'	511	93	71	0.00	106.24
155	'06/03'	665	80	58	0.00	110.73
156	'06/04'	383	87	62	0.00	106.24
157	'06/05'	554	88	65	0.00	125.69
158	'06/06'	511	89	69	0.00	106.24
159	'06/07'	409	89	69	0.00	121.20
160	'06/08'	596	91	70	0.00	133.17
161	'06/09'	622	91	69	0.00	116.71
162	'06/10'	443	89	70	0.00	88.28
163	'06/11'	545	93	72	0.00	86.79
164	'06/12'	349	90	71	0.10	86.79
165	'06/13'	417	89	71	0.27	88.28
166	'06/14'	485	88	72	0.05	98.76
167	'06/15'	502	89	71	0.00	106.24
168	'06/16'	545	88	68	0.00	122.70
169	'06/17'	529	90	70	0.00	80.80
170	'06/18'	499	87	72	0.00	131.67
171	'06/19'	433	88	70	0.01	160.10
172	'06/20'	615	89	71	0.00	152.62
173	'06/21'	630	91	68	0.83	136.16
174	'06/22'	613	91	74	0.00	104.74
175	'06/23'	465	93	71	0.94	107.73
176	'06/24'	488	95	74	0.06	113.72
177	'06/25'	563	95	73	0.16	112.22
178	'06/26'	612	92	73	0.00	125.69
179	'06/27'	390	90	70	0.28	131.67
180	'06/28'	365	87	71	0.02	170.58
181	'06/29'	612	90	74	0.00	115.22
182	'06/30'	459	89	75	0.00	136.16
183	'07/01'	477	93	77	0.00	98.76
184	'07/02'	528	97	75	0.10	91.27
185	'07/03'	477	95	76	0.00	101.75
186	'07/04'	528	93	74	0.00	115.22
187	'07/05'	340	89	74	0.09	85.29
188	'07/06'	179	82	73	0.07	94.27
189	'07/07'	315	86	73	0.40	100.25
190	'07/08'	577	90	66	0.00	86.79
191	'07/09'	592	90	67	0.00	83.79
192	'07/10'	604	93	68	0.00	91.27
193	'07/11'	588	93	73	0.00	83.79
194	'07/12'	551	93	73	0.00	91.27
195	'07/13'	593	95	73	0.00	97.26
196	'07/14'	429	92	74	0.00	110.73
197	'07/15'	596	96	72	0.00	116.71
198	'07/16'	528	91	73	0.00	167.59
199	'07/17'	238	82	71	0.04	188.53
200	'07/18'	247	84	71	0.20	151.13
201	'07/19'	647	93	69	0.00	116.71

continued

Table I-1 (continued). An Example of Daily Weather Inputs with Maximum Air Temperature for Each Average Week and Deviations of Maximum Temperature and Other Associated Weather Variables.

DOY	M/D	Solar	MaxT	MinT	Rain	Wind
202	'07/20'	536	97	73	0.00	101.75
203	'07/21'	485	96	77	0.00	101.75
204	'07/22'	239	85	72	0.11	112.22
205	'07/23'	383	87	71	0.77	104.74
206	'07/24'	511	89	72	0.00	98.76
207	'07/25'	605	91	72	0.00	95.76
208	'07/26'	630	93	74	0.00	97.26
209	'07/27'	579	94	75	0.00	100.25
210	'07/28'	639	95	76	0.00	71.82
211	'07/29'	596	89	65	0.00	109.23
212	'07/30'	511	90	67	0.00	139.16
213	'07/31'	613	94	68	0.00	113.72
214	'08/01'	588	93	69	0.00	115.22
215	'08/02'	664	87	64	0.00	119.70
216	'08/03'	639	88	63	0.00	128.68
217	'08/04'	622	90	63	0.00	122.70
218	'08/05'	481	94	74	0.04	122.70
219	'08/06'	174	83	69	0.41	122.70
220	'08/07'	444	82	71	0.39	97.26
221	'08/08'	630	91	72	0.00	118.21
222	'08/09'	634	94	72	0.00	101.75
223	'08/10'	562	95	73	0.00	92.77
224	'08/11'	553	94	72	0.00	113.72
225	'08/12'	418	92	75	0.00	82.30
226	'08/13'	526	95	75	0.00	85.29
227	'08/14'	522	95	76	0.00	89.78
228	'08/15'	345	91	74	0.00	91.27
229	'08/16'	426	88	71	0.00	98.76
230	'08/17'	149	82	72	0.02	94.27
231	'08/18'	425	89	70	0.48	94.27
232	'08/19'	536	93	72	0.00	100.25
233	'08/20'	587	90	74	0.00	92.77
234	'08/21'	587	86	59	0.00	116.71
235	'08/22'	570	90	62	0.00	125.69
236	'08/23'	536	91	69	0.00	94.27
237	'08/24'	502	93	70	0.00	98.76
238	'08/25'	510	92	69	0.00	122.70
239	'08/26'	330	92	69	0.17	95.76
240	'08/27'	370	88	68	0.08	125.69
241	'08/28'	607	88	71	0.01	101.75
242	'08/29'	595	92	71	0.06	106.24
243	'08/30'	227	93	71	0.00	95.76
244	'08/31'	243	85	71	0.77	82.30
245	'09/01'	434	82	72	0.04	88.28
246	'09/02'	580	87	70	0.00	89.78
247	'09/03'	584	89	69	0.18	113.72
248	'09/04'	506	88	70	0.00	98.76
249	'09/05'	538	89	70	0.00	74.82
250	'09/06'	551	90	70	0.00	85.29
251	'09/07'	633	90	60	0.00	85.29
252	'09/08'	614	81	57	0.00	121.20
253	'09/09'	525	84	56	0.00	68.62
254	'09/10'	556	84	59	0.00	146.50
255	'09/11'	156	81	68	1.07	153.90
256	'09/12'	409	85	69	0.00	24.57
257	'09/13'	453	89	68	0.20	22.79
258	'09/14'	527	89	69	0.00	44.80
259	'09/15'	477	91	71	0.00	111.70
260	'09/16'	341	88	64	2.54	149.63
261	'09/17'	204	81	71	0.00	230.43
262	'09/18'	503	80	57	0.76	139.16
263	'09/19'	497	82	56	0.00	103.24
264	'09/20'	495	84	57	0.00	119.70
265	'09/21'	535	88	61	0.00	104.74
266	'09/22'	484	88	64	0.00	104.74
267	'09/23'	573	76	53	0.00	107.73
268	'09/24'	529	78	54	0.00	101.75
269	'09/25'	502	81	58	0.00	122.70
270	'09/26'	407	82	60	0.00	130.18
271	'09/27'	510	82	58	0.00	104.74
272	'09/28'	499	85	59	0.00	85.29
273	'09/29'	491	87	60	0.00	79.30
274	'09/30'	536	64	50	0.31	145.14
275	'10/01'	553	72	45	0.00	110.73
276	'10/02'	494	77	48	0.00	119.70
277	'10/03'	374	85	52	0.00	139.16
278	'10/04'	357	85	55	0.00	133.17
279	'10/05'	383	85	60	0.00	101.75
280	'10/06'	426	85	60	0.00	95.76
281	'10/07'	496	86	58	0.00	83.79
282	'10/08'	144	87	65	0.00	110.73
283	'10/09'	487	76	39	0.21	115.22
284	'10/10'	489	63	39	0.00	85.29
285	'10/11'	484	80	47	0.00	115.22
286	'10/12'	474	88	55	0.00	119.70
287	'10/13'	502	65	37	0.00	154.12
288	'10/14'	349	64	35	0.00	155.62
289	'10/15'	443	72	40	0.00	88.28
290	'10/16'	434	66	47	0.00	104.74
291	'10/17'	417	76	44	0.00	139.16
292	'10/18'	374	86	46	0.00	121.20
293	'10/19'	110	82	49	0.00	134.67
294	'10/20'	374	77	60	0.03	118.21
295	'10/21'	434	76	48	0.01	85.29
296	'10/22'	404	77	52	0.00	82.30
297	'10/23'	272	80	53	0.00	103.24
298	'10/24'	440	70	36	0.00	139.16
299	'10/25'	351	65	36	0.00	107.73
300	'10/26'	47	70	43	0.04	82.30
301	'10/27'	152	68	51	1.99	109.23
302	'10/28'	204	59	49	0.00	148.13
303	'10/29'	77	60	51	0.00	83.79
304	'10/30'	60	70	55	0.30	101.75
305	'10/31'	289	83	59	0.16	145.14
306	'11/01'	213	84	67	0.00	154.12
307	'11/02'	426	74	54	0.58	170.58
308	'11/03'	196	63	55	0.00	95.76
309	'11/04'	426	62	40	0.00	103.24
310	'11/05'	434	69	39	0.00	124.19
311	'11/06'	374	71	44	0.00	136.16
312	'11/07'	366	76	49	0.00	86.79
313	'11/08'	366	64	56	1.39	155.62
314	'11/09'	408	62	44	0.00	118.21
315	'11/10'	315	60	37	0.00	85.29
316	'11/11'	74	68	52	0.01	155.50
317	'11/12'	143	68	59	0.53	179.60
318	'11/13'	393	65	37	0.00	36.68
319	'11/14'	398	60	37	0.00	69.49

continued

Table I-1 (continued). An Example of Daily Weather Inputs with Maximum Air Temperature for Each Average Week and Deviations of Maximum Temperature and Other Associated Weather Variables.

DOY	M/D	Solar	Max.T	Min.T	Rain	Wind
320	'11/15'	396	66	37	0.00	23.04
321	'11/16'	394	59	36	0.00	50.71
322	'11/17'	362	67	39	0.00	82.50
323	'11/18'	159	69	42	0.00	172.07
324	'11/19'	141	59	42	0.00	148.13
325	'11/20'	321	65	38	0.00	154.12
326	'11/21'	336	58	40	0.00	95.76
327	'11/22'	30	63	48	2.07	167.59
328	'11/23'	38	65	42	2.43	118.21
329	'11/24'	37	57	43	0.00	148.13
330	'11/25'	102	72	57	0.00	128.68
331	'11/26'	145	59	56	0.04	185.54
332	'11/27'	383	54	39	0.00	88.28
333	'11/28'	426	56	33	0.00	212.47
334	'11/29'	324	63	39	0.00	170.58
335	'11/30'	290	64	34	0.00	107.73
336	'12/01'	170	41	35	0.00	142.15
337	'12/02'	146	46	40	1.86	191.80
338	'12/03'	329	48	32	0.00	208.70
339	'12/04'	327	55	33	0.00	112.40
340	'12/05'	278	59	34	0.00	68.38
341	'12/06'	129	64	36	0.00	55.71
342	'12/07'	80	63	48	0.00	93.50
343	'12/08'	47	60	56	0.15	108.60
344	'12/09'	104	52	40	0.06	121.20
345	'12/10'	316	42	30	0.00	86.79
346	'12/11'	315	51	32	0.00	85.29
347	'12/12'	290	62	39	0.00	97.26
348	'12/13'	278	61	43	0.00	115.22
349	'12/14'	163	56	33	0.00	80.80
350	'12/15'	191	57	39	0.00	94.27
351	'12/16'	339	55	19	0.00	115.22
352	'12/17'	347	31	19	0.00	91.27
353	'12/18'	319	43	24	0.00	83.79
354	'12/19'	96	56	33	0.00	94.27
355	'12/20'	176	62	43	0.00	109.23
356	'12/21'	66	65	51	0.11	213.97
357	'12/22'	60	62	52	0.52	188.53
358	'12/23'	165	64	46	0.56	91.30
359	'12/24'	300	59	32	0.00	106.50
360	'12/25'	85	40	30	0.08	79.90
361	'12/26'	87	42	34	0.00	78.20
362	'12/27'	95	43	35	0.04	49.54
363	'12/28'	110	50	38	0.00	100.40
364	'12/29'	88	59	43	0.00	128.70
D. MEAN:		419.5	78.5	57.9	0.90*	117.2
AWD:		-1.06	0.03	0.08	-0.05	-0.22

* Sum of precipitation in a week (inches)

DOY–Day of the year
M/D–Calendar Month and Day
Solar–Daily total solar radiation (Langleys/day)
Max. T–Daily maximum air temperature (° F)
Min. T–Daily minimum air temperature (° F)
Rain–Daily total rainfall (inches/day)
Wind–Daily total wind run (miles/day)
D. MEAN–Average daily value for each weather variable over these 9 months
AWD–Average weekly deviation from the mean of each weather variable

Appendix I Tables I-2.1, 2.2, 2.3, 2.4, and 2.5 are deviations from average of five weather variables (maximum and minimum air temperature, **Max T.** and **Min T.**; solar radiation, **Solar**; rainfall, **Rain**; and windrun, **Wind**), respectively. The first line of each table is the goal or **DEVIATION** desired. The second line is the actual, average of weekly deviations over the 9 months (from April to December) of the particular variable, selected from the 28 years of weather records. The third through sixth lines are the actual, averages of weekly deviations over the 9 months of the other associated weather variables.

Table I-2.1. The deviations of daily maximum temperature and other associated weather variables.

DEVIATION	-10 %	-5 %	-1 %	0.0 %	+ 1 %	+ 5 %	+10 %
Max T. %	-9.04	-4.96	-1.09	0.03	1.10	4.91	8.91
Min T. %	-9.94	-5.65	-1.75	0.08	0.38	4.66	8.88
Solar %	-9.55	-4.24	3.29	-1.06	7.16	5.15	5.19
Rain in.	0.23	0.23	-0.09	-0.05	0.30	-0.49	-0.39
Wind %	0.80	3.04	-0.86	-0.22	3.43	3.13	-1.84

Table I-2.2. The deviations of daily minimum temperature and other associated weather variables.

DEVIATION	-10 %	-5 %	-1 %	0.0 %	+1 %	+5 %	+10 %
Min T. %	-9.24	-4.79	-0.97	-0.05	0.89	4.87	9.01
Max T. %	-6.37	-3.06	-0.33	-0.42	1.65	3.87	4.36
Solar %	2.70	2.80	4.39	-0.47	-0.08	0.36	-5.10
Rain in.	-0.07	-0.09	-0.09	0.39	0.04	-0.04	-0.05
Wind %	-1.90	-3.01	-2.84	0.64	0.30	0.28	2.68

Table I-2.3. The deviations of daily solar radiation and other associated weather variables.

DEVIATION	-50 %	-10 %	-5 %	0.0 %	+5 %	+10 %	+50 %
Solar %	-36.87	-25.24	-9.99	-0.17	9.81	24.42	33.37
Max T. %	-5.14	-3.01	-2.39	1.70	1.02	2.28	1.20
Min T. %	3.56	3.93	-0.60	1.33	1.57	-2.82	-5.69
Rain in.	1.62	1.20	0.35	-0.33	-0.43	-0.69	-0.59
Wind %	6.75	5.59	-4.65	0.12	4.18	-1.73	-1.10

Table I-2.4. The deviations of weekly precipitation and other associated weather variables.

DEVIATION	-1.0 in.	-0.5 in.	-0.25 in.	0.0 in.	+1.0 in.	+2.0 in.	+3.0 in.
Rain in.	-0.85	-0.50	-0.27	-0.03	0.99	1.88	2.63
Max T. %	0.23	0.34	0.07	-0.46	-3.56	-2.85	-1.58
Min T. %	-2.39	0.72	2.77	1.61	-0.60	1.63	3.64
Solar %	7.65	-2.07	0.68	-4.56	-11.24	-15.36	-16.19
Wind %	5.53	-1.56	-2.37	-3.50	1.83	0.84	-0.35

Table I-2.5. The deviations of daily wind run and other associated weather variables.

DEVIATION	-50 %	-25 %	-10 %	0.0 %	+10 %	+25 %	+50 %
Wind %	-39.05	-24.51	-9.71	0.0	9.79	24.46	40.07
Max T. %	-0.06	-0.35	-0.26	0.70	-2.33	-1.10	-3.46
Min T. %	-1.80	-0.87	-0.72	1.28	0.14	-0.88	-4.65
Solar %	2.76	1.56	1.80	0.90	-9.19	1.50	-0.11
Rain in.	-0.21	-0.02	-0.12	-0.16	0.50	0.58	0.09

Table I-3. Predicted cotton responses using -1.0% deviation of average maximum temperature for 3 emergence dates, 2 row spacings, and 2 plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (Inches)				Row Spacing (Inches)				Row Spacing (Inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.42	2.42	2.70*	2.61	2.75	2.80	3.02*1	3.14	2.60*	2.64	2.45*	2.69
MD	10/13	9/17	11/01	9/22	10/30	10/12	1/01	10/25	10/31	11/01	10/31	10/31
PHT	29.7	25.9	36.6	31.4	38.1	31.4	45.2	39.8	34.3	31.8	38.4	36.4
NN	22	19	24	21	22	19	25	22	24	22	25	24
FS	6/04	6/04	6/04	6/04	6/13	6/13	6/13	6/13	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/18	8/17	8/18	8/18	8/26	8/26	8/26	8/26	9/11	9/11	9/11	9/11
SO.	Sha.8											
VAR	Mid											
YLD	1.57	1.48	1.60	1.61	1.88	1.84	1.99	2.08	2.12*	1.94	2.07*	2.00*
MD	9/25	9/16	10/02	9/20	10/28	10/02	11/01	10/11	11/01	11/01	11/01	11/01
PHT	42.5	35.9	41.2	37.3	44.7	38.8	51.6	47.1	44.2	37.3	49.1	44.8
NN	21	19	21	21	22	20	23	21	22	20	23	21
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/25	6/25	6/25	6/25
FB	6/28	6/28	6/29	6/29	7/08	7/08	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/16	8/06	8/16	8/16	8/27	8/27	8/26	8/26	9/13	9/12	9/13	9/12
SO.	Sha.8											
VAR	De119											
YLD	2.76	2.80	3.62*	3.58	2.70	2.69	3.46*	3.49	2.71*	2.75	2.93*	3.40*
MD	10/09	9/18	11/01	10/09	10/29	10/02	11/01	10/25	10/30	10/30	10/30	10/31
PHT	41.5	34.6	48.0	40.7	45.3	38.1	50.8	42.1	41.6	38.6	45.7	41.7
NN	22	19	25	22	22	19	25	21	23	21	25	23
FS	6/04	6/04	6/04	6/04	6/13	6/13	6/13	6/13	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/18	8/18	8/18	8/18	8/26	8/26	8/26	8/26	9/11	9/11	9/11	9/11
SO.	Dub.7											
VAR	Mid											
YLD	2.21	2.21	2.35	2.45	2.37	2.37	2.62*	2.64	2.44*	2.39	2.53*	2.63*
MD	10/02	9/22	10/26	9/30	10/30	10/12	11/01	10/26	11/01	10/31	11/01	10/31
PHT	52.5	46.8	56.7	52.5	56.7	52.0	70.2	60.7	57.5	51.0	61.5	58.0
NN	22	21	23	22	22	21	26	24	23	21	24	23
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/25	6/25	6/25	6/25
FB	6/28	6/28	6/29	6/29	7/08	7/08	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/16	8/16	8/17	8/18	8/27	8/27	8/26	8/26	9/13	9/13	9/13	9/13
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmaxm01.act Future weather: tmaxm01.cld

Table I-4. Predicted cotton responses using -5% deviation of average maximum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.85*	2.87	3.08*	3.18*	2.77*	2.74	2.99*	3.25*	1.98*	2.37*	1.77*	2.01*
MD	11/01	10/27	10/31	11/01	10/31	10/27	11/01	11/01	10/30	10/30	10/30	10/30
PHT	38.8	35.4	43.5	41.0	39.2	34.9	44.0	38.9	35.8	31.3	36.5	32.5
NN	21	19	24	23	21	19	24	22	22	21	22	21
FS	6/10	6/10	6/10	6/10	6/18	6/18	6/18	6/18	6/29	6/29	6/29	6/29
FB	7/08	7/08	7/08	7/08	7/14	7/14	7/14	7/14	7/25	7/25	7/25	7/25
FOB	9/09	9/09	9/09	9/09	9/17	9/17	9/17	9/17	10/02	10/02	10/02	10/02
SO.	Sha.8											
VAR	Mid											
YLD	2.61*	2.49	2.78*	2.81	2.43*	2.40	2.51*	2.76*	1.77*	1.83*	1.56*	1.85*
MD	11/01	10/29	10/31	11/01	10/31	11/01	11/01	11/01	11/01	11/01	10/30	11/01
PHT	53.9	49.2	59.9	58.5	52.2	47.5	58.4	51.2	48.4	37.7	49.5	41.3
NN	21	20	24	24	22	20	24	22	22	19	22	20
FS	6/09	6/09	6/09	6/09	6/16	6/16	6/16	6/16	6/28	6/28	6/28	6/28
FB	7/08	7/08	7/08	7/08	7/14	7/14	7/14	7/14	7/26	7/26	7/26	7/26
FOB	9/09	9/09	9/09	9/09	9/16	9/16	9/17	9/17	10/03	10/03	10/03	10/03
SO.	Sha.8											
VAR	De119											
YLD	2.96*	2.94	3.09*	3.20	2.86*	2.85	3.03*	3.28*	2.06*	2.48*	1.82*	2.14*
MD	11/01	10/27	11/01	11/01	10/31	10/27	11/01	11/01	10/30	10/30	10/3	10/30
PHT	39.0	35.6	43.7	41.1	39.7	35.3	44.4	40.5	37.2	34.1	037.5	34.5
NN	21	19	24	23	21	19	24	23	22	21	22	21
FS	6/10	6/10	6/10	6/10	6/18	6/18	6/18	6/18	6/29	6/29	6/29	6/29
FB	7/08	7/08	7/08	7/08	7/14	7/14	7/14	7/14	7/25	7/25	7/25	7/25
FOB	9/09	9/09	9/09	9/09	9/17	9/17	9/17	9/17	10/02	10/02	10/02	10/02
SO.	Dub.7											
VAR	Mid											
YLD	2.71*	2.57	2.84*	2.86	2.53*	2.48	2.59*	2.83*	1.82*	2.00*	1.63*	2.04*
MD	11/01	10/29	10/31	11/01	10/31	10/29	11/01	11/01	10/30	10/31	10/31	10/31
PHT	54.4	49.7	60.5	59.1	52.6	48.2	59.4	51.8	52.4	45.1	53.5	46.4
NN	21	20	24	24	22	20	24	22	23	21	23	21
FS	6/09	6/09	6/09	6/09	6/16	6/16	6/16	6/16	6/28	6/28	6/28	6/28
FB	7/08	7/08	7/08	7/08	7/14	7/14	7/14	7/14	7/26	7/26	7/26	7/26
FOB	9/09	9/09	9/09	9/09	9/17	9/17	9/17	9/17	10/03	10/03	10/03	10/03
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmaxm05.act Future weather: tmaxm05.cld

Table I-5. Predicted cotton responses using -10% deviation of average maximum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (Inches)				Row Spacing (Inches)				Row Spacing (Inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.47*	2.73	2.11*	2.42*	1.69*	2.10*	1.51*	1.75*	0.95	1.26*	0.81*	1.07*
MD	10/20	10/20	10/20	10/20	10/18	10/18	10/18	10/18	10/16	10/16	10/16	10/16
PHT	41.5	36.6	46.0	36.3	39.8	31.1	39.9	32.6	35.1	32.6	35.1	32.8
NN	22	20	23	20	21	18	21	19	19	18	19	18
FS	6/12	6/12	6/12	6/12	6/19	6/19	6/19	6/19	7/01	7/01	7/01	7/01
FB	7/11	7/11	7/11	7/11	7/17	7/17	7/17	7/17	7/29	7/29	7/29	7/29
FOB	9/18	9/18	9/18	9/18	9/24	9/24	9/24	9/24	10/06	10/06	10/06	10/06
SO.	Sha.8											
VAR	Mid 4											
YLD	1.93*	1.85*	1.82*	1.92*	1.57*	1.75*	1.47*	1.86*	0.83*	1.16*	0.71*	1.05*
MD	10/19	10/19	10/20	10/20	10/19	10/19	10/19	10/20	10/17	10/17	10/17	10/17
PHT	49.2	47.0	54.9	49.0	54.9	49.5	58.0	55.5	51.4	48.7	56.6	49.2
NN	20	20	21	20	21	20	22	21	20	19	21	19
FS	6/10	6/10	6/10	6/10	6/17	6/17	6/17	6/17	6/29	6/29	6/29	6/29
FB	7/11	7/11	7/11	7/11	7/17	7/16	7/17	7/17	7/28	7/28	7/29	7/29
FOB	9/18	9/18	9/18	9/18	9/24	9/23	9/24	9/24	10/05	10/05	10/06	10/06
SO.	Sha.8											
VAR	De119											
YLD	2.47*	2.73	2.11*	2.43*	1.69*	2.10*	1.51*	1.75*	0.95*	1.26*	0.81*	1.07*
MD	10/20	10/20	10/20	10/20	10/18	10/18	10/18	10/18	10/16	10/16	10/16	10/16
PHT	41.6	36.6	46.1	36.4	40.0	31.2	40.0	32.7	35.2	32.7	35.2	32.9
NN	22	20	23	20	21	18	21	19	19	18	19	18
FS	6/12	6/12	6/12	6/12	6/19	6/19	6/19	6/19	7/01	7/01	7/01	7/01
FB	7/11	7/11	7/11	7/11	7/17	7/17	7/17	7/17	7/29	7/29	7/29	7/29
FOB	9/18	9/18	9/18	9/18	9/24	9/24	9/24	9/24	10/06	10/06	10/06	10/06
SO.	Dub.7											
VAR	Mid											
YLD	1.95*	1.86*	1.82*	1.92*	1.61*	1.80*	1.45*	1.88*	0.84*	1.16*	0.72*	1.05*
MD	10/19	10/19	10/20	10/20	10/19	10/20	10/19	10/20	10/17	10/17	10/17	10/17
PHT	49.5	47.2	55.0	49.1	55.4	50.0	58.1	55.7	51.5	48.9	56.6	49.2
NN	20	20	21	20	21	20	22	21	20	19	21	19
FS	6/10	6/10	6/10	6/10	6/17	6/17	6/17	6/17	6/29	6/29	6/29	6/29
FB	7/11	7/11	7/11	7/11	7/17	7/16	7/17	7/17	7/28	7/28	7/29	7/29
FOB	9/18	9/18	9/18	9/18	9/24	9/23	9/24	9/24	10/05	10/05	10/06	10/06
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmaxm10.act Future weather: tmaxm10.cld

Table I-6. Predicted cotton responses using +1% deviation of average maximum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.88	0.92	0.93	0.90	0.99	1.00	1.09	1.09	1.77*	1.69	1.78*	1.76
MD	9/12	9/05	9/14	9/05	9/28	9/13	10/01	9/19	10/30	10/22	11/01	10/27
PHT	23.2	20.3	26.7	22.7	23.6	23.2	26.8	25.8	25.2	24.0	29.5	27.9
NN	20	19	21	19	21	20	23	21	24	21	24	23
FS	6/01	6/01	6/01	6/01	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/20	7/20	7/20	7/20
FOB	8/11	8/11	8/11	8/11	8/22	8/22	8/22	8/22	9/07	9/07	9/07	9/07
SO.	Sha.8											
VAR	Mid											
YLD	0.62	0.65	0.63	0.64	0.61	0.55	0.58	0.55	1.11	0.98	1.08*	0.98
MD	9/10	9/06	9/12	9/06	9/27	9/19	9/27	9/20	11/01	10/27	11/01	10/31
PHT	25.1	24.5	29.6	28.1	26.4	27.0	29.8	30.5	30.2	28.8	33.4	31.5
NN	19	18	21	18	18	18	19	19	21	19	22	20
FS	5/31	5/31	5/31	5/31	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/06	7/06	7/06	7/06	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/23	8/23	8/23	8/23	9/07	9/07	9/07	9/07
SO.	Sha.8											
VAR	De119											
YLD	1.36	1.29	1.49	1.33	1.95	1.78	2.29*	1.91*	2.47*	2.55	2.70*	2.85
MD	9/25	9/09	10/01	9/12	10/23	9/30	11/01	10/05	11/01	10/31	11/01	11/01
PHT	29.6	28.6	32.3	31.2	29.3	27.8	34.1	31.6	33.1	30.7	38.9	34.6
NN	20	19	22	20	22	21	24	23	23	21	25	23
FS	6/01	6/01	6/01	6/01	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/22	8/22	8/22	8/22	9/07	9/07	9/07	9/07
SO.	Dub.7											
VAR	Mid											
YLD	0.87	0.82	1.01	0.88	1.09	0.96	1.25	1.15	1.78*	1.56	1.97*	1.84*
MD	9/09	9/06	9/21	9/10	10/08	9/21	10/29	9/27	11/01	10/31	11/01	11/01
PHT	34.7	33.0	37.7	36.5	36.1	33.9	40.4	37.1	43.2	39.9	45.9	42.6
NN	20	18	21	19	22	19	22	20	23	21	22	21
FS	5/31	5/31	5/31	5/31	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/26	6/26	7/06	7/06	7/06	7/06	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/23	8/23	8/23	8/23	9/07	9/07	9/07	9/07
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmaxp01.act Future weather: tmaxp01.hot

Table I-7. Predicted cotton responses using -5% deviation of average maximum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.24	0.24	0.22	0.22	0.23	0.20	0.22	0.22	0.32	0.30	0.30	0.29
MD	8/19	8/16	8/23	8/19	9/07	9/03	9/07	9/03	9/30	9/23	9/27	9/21
PHT	12.2	12.6	13.3	13.4	10.9	9.4	12.0	11.9	12.1	11.6	14.1	13.6
NN	13	12	15	13	17	15	18	16	18	16	19	17
FS	5/30	5/30	5/30	5/30	6/09	6/09	6/09	6/09	6/24	6/24	6/24	6/24
FB	6/23	6/23	6/23	6/23	7/02	7/02	7/02	7/02	7/17	7/17	7/17	7/07
FOB	8/02	8/02	8/02	8/02	8/12	8/12	8/12	8/12	8/27	8/27	8/27	8/27
SO.	Sha.8											
VAR	Mid											
YLD	0.17	0.11	0.14	0.10	0.12	0.08	0.13	0.10	0.15	0.14	0.17	0.14
MD	8/27	8/30	8/27	8/27	9/05	9/05	9/08	9/05	9/30	9/23	10/04	9/23
PHT	17.6	17.2	18.2	17.1	12.3	12.4	14.2	13.4	15.4	14.8	19.2	17.4
NN	16	15	16	15	16	15	18	15	18	16	20	18
FS	5/29	5/29	5/29	5/29	6/07	6/07	6/07	6/07	6/22	6/22	6/22	6/22
FB	6/23	6/23	6/23	6/23	7/01	7/01	7/01	7/01	7/16	7/16	7/16	7/16
FOB	8/02	8/02	8/02	8/02	8/11	8/11	8/11	8/11	8/26	8/26	8/26	8/26
SO.	Sha.8											
VAR	De119											
YLD	0.61	0.60	0.64	0.62	0.70	0.66	0.74	0.66	0.75*	0.70	0.78	0.73
MD	9/01	8/27	9/06	8/28	9/14	9/08	9/17	9/10	10/11	9/28	10/12	10/04
PHT	20.6	20.3	23.9	22.6	21.4	20.7	25.3	23.9	22.5	21.7	23.5	23.4
NN	18	17	20	17	21	19	22	20	22	20	22	20
FS	5/30	5/30	5/30	5/30	6/09	6/09	6/09	6/09	6/24	6/24	6/24	6/24
FB	6/23	6/23	6/23	6/23	7/02	7/02	7/02	7/02	7/17	7/17	7/17	7/17
FOB	8/02	8/02	8/02	8/02	8/12	8/12	8/12	8/12	8/27	8/27	8/27	8/27
SO.	Dub.7											
VAR	Mid											
YLD	0.53	0.32	0.50	0.42	0.51	0.42	0.55	0.45	0.45	0.42	0.49	0.47
MD	9/02	8/26	9/03	8/29	9/14	9/09	9/17	9/10	10/07	9/26	10/12	10/04
PHT	24.2	22.3	27.7	26.3	27.2	26.2	32.2	30.2	29.4	30.0	33.4	32.7
NN	19	17	19	18	20	19	21	19	19	18	20	19
FS	5/29	5/29	5/29	5/29	6/07	6/07	6/07	6/07	6/22	6/22	6/22	6/22
FB	6/23	6/23	6/23	6/23	7/01	7/01	7/01	7/01	7/16	7/16	7/16	7/16
FOB	8/02	8/02	8/02	8/02	8/11	8/11	8/11	8/11	8/26	8/26	8/26	8/26
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmaxp05.act Future weather: tmaxp05.hot

Table I-8. Predicted cotton responses using +10% deviation of average maximum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.39*	0.37	0.37	0.37	0.22	0.21	0.19	0.19	0.25	0.23	0.22	0.19
MD	10/18	8/25	8/28	8/28	9/06	9/01	9/05	9/01	9/21	9/22	9/22	9/21
PHT	21.0	19.9	24.1	24.6	12.3	11.5	13.2	13.2	11.6	10.8	12.1	11.2
NN	16	14	16	15	15	14	16	15	15	14	16	16
FS	5/28	5/28	5/28	5/28	6/08	6/08	6/08	6/08	6/23	6/23	6/23	6/23
FB	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01	7/16	7/16	7/16	7/16
FOB	7/28	7/28	7/28	7/28	8/08	8/08	8/08	8/08	8/25	8/25	8/25	8/25
SO.	Sha.8											
VAR	Mid											
YLD	0.22	0.17	0.20	0.20	0.10	0.08	0.11	0.09	0.11	0.04	0.12	0.14
MD	8/28	8/25	8/27	8/27	9/06	9/03	9/06	9/03	9/25	9/25	9/25	9/23
PHT	24.9	23.2	30.2	29.2	15.0	15.6	19.2	18.1	15.4	15.6	17.5	17.4
NN	17	15	17	16	15	14	16	15	16	16	18	18
FS	5/27	5/27	5/27	5/27	6/07	6/07	6/07	6/07	6/22	6/22	6/22	6/22
FB	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01	7/17	7/17	7/17	7/17
FOB	7/28	7/28	7/28	7/28	8/08	8/08	8/08	8/08	8/26	8/26	8/26	8/26
SO.	Sha.8											
VAR	De119											
YLD	0.59*	0.61*	0.61*	0.64*	0.40	0.41	0.40	0.41	0.54	0.52	0.56	0.53
MD	11/01	11/01	10/19	10/23	9/08	9/04	9/09	9/05	9/25	9/20	9/28	9/22
PHT	28.2	27.4	30.7	30.4	19.2	18.6	20.8	20.3	19.6	18.6	21.7	21.0
NN	19	17	19	18	17	16	18	17	20	18	21	19
FS	5/28	5/28	5/28	5/28	6/08	6/08	6/08	6/08	6/23	6/23	6/23	6/23
FB	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01	7/16	7/16	7/16	7/16
FOB	7/28	7/28	7/28	7/28	8/08	8/08	8/08	8/08	8/25	8/25	8/25	8/25
SO.	Dub.7											
VAR	Mid											
YLD	0.38	0.38	0.40	0.41	0.26	0.23	0.25	0.23	0.35	0.32	0.36	0.31
MD	8/30	8/24	8/30	8/25	9/08	9/05	9/09	9/05	9/22	9/20	9/27	9/19
PHT	37.1	37.3	41.0	41.2	25.6	24.8	27.1	26.6	22.9	22.1	25.1	24.7
NN	18	18	19	19	17	16	17	16	19	18	19	18
FS	5/27	5/27	5/27	5/27	6/07	6/07	6/07	6/07	6/22	6/22	6/22	6/22
FB	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01	7/17	7/17	7/17	7/17
FOB	7/28	7/28	7/28	7/28	8/08	8/08	8/08	8/08	8/26	8/26	8/26	8/26
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmaxp10.act Future weather: tmaxp10.hot

Table I-9. Predicted cotton responses using average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.53	2.54	2.76*	2.75	2.44	2.54	2.50	2.57	2.07*	2.29	2.15*	2.36*
MD	10/15	9/22	11/01	10/14	10/23	10/05	11/01	10/23	11/01	10/27	11/01	10/31
PHT	46.8	40.5	51.2	44.0	47.4	41.3	50.6	43.8	43.5	40.5	46.8	43.4
NN	23	20	26	24	25	22	25	23	24	22	25	23
FS	6/04	6/04	6/04	6/04	6/13	6/13	6/13	6/13	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/18	8/18	8/18	8/18	8/26	8/26	8/26	8/26	9/11	9/11	9/11	9/11
SO.	Sha.8											
VAR	Mid											
YLD	2.19	2.08	2.12	2.16	1.94	1.89	1.91	1.98	1.52*	1.53	1.64*	1.65
MD	10/21	9/26	10/30	10/03	10/28	10/12	11/01	10/21	11/01	10/28	11/01	10/31
PHT	63.1	56.4	69.2	59.8	62.8	54.4	64.4	57.5	53.1	51.9	58.0	54.1
NN	24	24	26	24	23	22	24	23	22	21	23	22
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/24	6/24	6/24	6/24
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/17	8/17	8/17	8/17	8/26	8/26	8/26	8/26	9/09	9/09	9/09	9/09
SO.	Sha.8											
VAR	De119											
YLD	2.72	2.65	3.53*	3.45*	2.77	2.69	3.43*	3.48*	2.65*	2.75	2.78*	3.30*
MD	10/20	9/23	11/01	10/19	10/28	10/08	11/01	10/23	11/01	10/28	11/01	11/01
PHT	49.1	41.6	56.7	46.4	49.0	40.8	54.7	48.9	49.1	40.9	54.8	47.2
NN	22	19	28	25	22	19	26	25	24	20	27	24
FS	6/04	6/04	6/04	6/04	6/13	6/13	6/13	6/13	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/17	8/17	8/17	8/17	8/26	8/26	8/26	8/26	9/10	9/10	9/10	9/10
SO.	Dub.7											
VAR	Mid											
YLD	2.43	2.27	2.75*	2.56*	2.42	2.27	2.65*	2.46	2.31*	2.24	2.35*	2.41*
MD	10/22	10/01	11/01	10/15	10/31	10/15	11/01	10/28	11/01	11/01	11/01	10/31
PHT	65.4	61.5	78.0	72.4	65.8	60.2	74.1	67.1	63.8	60.4	71.8	65.7
NN	22	24	28	28	23	23	26	26	24	24	26	25
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/24	6/24	6/24	6/24
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/17	8/17	8/17	8/17	8/26	8/26	8/26	8/26	9/10	9/10	9/09	9/09
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmin00.act Future weather: tmin00.nor

Table I-10. Predicted cotton responses using -1% deviation of average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30			38	30			38	30			38
PPF	2.42	4	2	4	2	4	2	4	2	4	2	4
YLD	9/29	2.50	2.69	2.75	2.42	2.66	2.76*	2.83	2.33*	2.54	2.48*	2.86*
MD	40.5	9/19	10/24	9/28	10/09	10/01	10/31	10/14	11/01	10/26	11/01	10/31
PHT	24	36.4	41.8	40.0	39.5	37.1	43.6	39.8	38.4	35.4	41.9	39.1
NN	6/04	23	26	23	24	21	25	23	24	21	25	23
FS	6/29	6/04	6/04	6/04	6/13	613	6/13	6/13	6/27	6/27	6/27	6/27
FB	8/18	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/21	7/21	7/21	7/21
FOB	Sha.8	8/18	8/18	8/18	8/28	8/28	8/28	8/28	9/13	9/13	9/13	9/13
SO.	Mid											
VAR												
YLD	1.53	1.55	1.71	1.80	1.50	1.64	1.73*	1.91	1.52*	1.60	1.69*	1.83*
MD	9/30	9/18	10/13	9/24	10/21	9/30	11/01	10/15	10/31	10/29	10/31	11/01
PHT	49.3	45.9	54.9	51.8	46.9	46.2	52.8	49.2	48.9	45.2	53.8	50.6
NN	21	20	23	23	21	21	23	23	22	22	23	22
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	6/28	7/07	7/07	7/07	7/07	7/21	7/21	7/21	7/21
FOB	8/17	8/17	8/16	8/16	8/27	8/27	8/27	8/27	9/12	9/12	9/12	9/12
SO.	Sha.8											
VAR	De119											
YLD	2.70	2.72	3.47*	3.49*	2.68	2.70	3.41*	3.46*	2.58*	2.65	2.90*	3.34*
MD	9/30	9/19	11/01	9/30	10/24	10/02	10/31	10/20	11/01	10/29	11/01	10/31
PHT	44.0	38.4	50.4	44.2	42.4	37.9	49.0	42.0	41.6	38.2	49.0	42.3
NN	22	19	27	24	21	18	25	22	22	20	26	23
FS	6/04	6/04	6/04	6/04	6/13	6/13	6/13	6/13	6/27	6/27	6/27	6/27
FB	6/29	6/29	6/29	6/29	7/07	7/07	7/07	7/07	7/21	7/21	7/21	7/21
FOB	8/18	8/18	8/18	8/18	8/28	8/28	8/28	8/28	9/13	9/13	9/13	9/13
SO.	Dub.7											
VAR	Mid											
YLD	2.35*	2.22*	2.52*	2.34*	2.27*	2.27	2.53*	2.37*	2.19*	2.19	2.33*	2.46*
MD	10/23	9/25	11/01	10/04	10/31	10/15	11/01	10/27	10/31	11/01	10/31	11/01
PHT	61.0	58.2	68.5	71.1	59.4	53.1	65.3	60.1	50.0	52.2	63.7	57.0
NN	26	27	27	28	25	23	26	25	24	23	25	24
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/28	6/28	7/07	7/07	7/07	7/07	7/21	7/21	7/21	7/21
FOB	8/18	8/17	8/17	8/17	8/28	8/28	8/28	8/28	9/13	9/13	9/13	9/13
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tminm01.act Future weather: tminm01.cld

Table I-11. Predicted cotton responses using -5% deviation of average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.64	2.76	3.04*	3.11	2.56	2.53	2.54*	2.42	2.32*	2.66	2.17*	2.56*
MD	10/27	10/06	11/01	10/24	10/31	10/18	10/27	10/23	10/29	10/30	10/29	10/30
PHT	40.3	34.8	44.1	41.7	31.4	26.0	36.1	27.9	37.1	29.8	41.7	36.5
NN	24	20	25	24	21	18	23	19	24	21	25	23
FS	6/07	6/07	6/07	6/07	6/15	6/15	6/05	6/15	6/27	6/27	6/27	6/27
FB	7/04	7/04	7/04	7/04	7/12	7/12	7/12	7/12	7/23	7/23	7/23	7/23
FOB	8/31	8/31	8/31	8/31	9/09	9/08	9/09	9/08	9/27	9/27	9/27	9/27
SO.	Sha.8											
VAR	Mid											
YLD	1.61	1.56	1.68	1.72	1.48	1.37	1.66*	1.56	1.92*	1.76	1.87*	1.87*
MD	10/27	10/16	10/27	10/22	10/31	10/20	10/31	10/29	11/01	11/01	11/01	11/01
PHT	48.9	49.5	52.3	50.9	37.8	34.9	39.5	37.7	43.1	35.8	50.6	40.1
NN	20	21	21	21	20	18	20	19	21	19	23	20
FS	6/05	6/05	6/05	6/05	6/14	6/14	6/14	6/12	6/26	6/26	6/26	6/26
FB	7/03	7/03	7/03	7/03	7/13	7/13	7/12	7/12	7/23	7/23	7/23	7/23
FOB	8/28	8/28	8/28	8/28	9/07	9/07	9/06	9/06	9/25	9/25	9/26	9/25
SO.	Sha.8											
VAR	De119											
YLD	2.95	2.95	3.67*	3.84	2.91	3.05	2.92*	3.32	2.52*	2.85*	2.32*	2.81*
MD	10/30	10/13	11/01	10/29	11/01	10/28	11/01	11/01	10/29	10/31	10/30	10/31
PHT	43.9	39.3	53.3	45.7	41.6	33.9	48.4	40.1	42.6	35.8	47.2	40.9
NN	22	20	27	23	23	20	26	23	23	20	25	23
FS	6/07	6/07	6/07	6/07	6/15	6/15	6/15	6/15	6/27	6/27	6/27	6/27
FB	7/04	7/04	7/04	7/04	7/12	7/12	7/12	7/12	7/23	7/23	7/23	7/23
FOB	8/31	8/31	8/31	8/31	9/10	9/10	9/10	9/10	9/28	9/28	9/28	9/28
SO.	Dub.7											
VAR	Mid											
YLD	2.51	2.45	2.68	2.75	2.33*	2.35	2.27*	2.48	2.11*	2.02*	2.11*	2.44*
MD	10/30	10/16	10/31	10/24	11/01	10/26	11/01	11/01	11/01	10/31	11/01	11/01
PHT	60.9	55.5	68.1	63.8	52.4	47.6	59.7	52.7	53.3	45.4	59.0	53.3
NN	23	21	25	24	22	21	24	22	22	21	23	22
FS	6/05	6/05	6/05	6/05	6/14	6/14	6/14	6/14	6/26	6/26	6/26	6/26
FB	7/03	7/03	7/03	7/03	7/12	7/12	7/12	7/12	7/24	7/24	7/23	7/23
FOB	8/29	8/29	8/30	8/30	9/09	9/09	9/09	9/09	9/28	9/27	9/27	9/27
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tmin05.act Future weather: tminm05.cld

Table I-12. Predicted cotton responses using -10% deviation of average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	1.56	1.72	1.71	1.82	1.60*	1.64	1.62	1.76	1.12*	1.35*	1.11*	1.31*
MD	10/31	10/20	11/01	10/02	11/01	10/28	11/01	11/01	10/29	10/30	10/30	10/30
PHT	31.7	29.0	36.4	32.4	29.5	29.5	33.5	32.4	25.4	24.3	29.2	27.0
NN	21	19	21	20	20	20	21	20	18	17	19	18
FS	6/13	6/13	6/13	6/13	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01
FB	7/11	7/11	7/11	7/11	7/18	7/18	7/18	7/18	7/29	7/29	7/29	7/29
FOB	9/16	9/16	9/17	9/17	9/25	9/25	9/25	9/25	10/06	10/06	10/06	10/06
SO.	Sha.8											
VAR	Mid											
YLD	0.70	0.79	0.77	0.94	0.74*	0.79	0.80*	0.88	0.81*	0.82*	0.86*	0.94
MD	10/30	10/23	10/31	10/26	11/01	11/01	11/01	11/01	11/01	11/01	11/01	11/01
PHT	31.7	33.2	38.8	38.3	34.9	34.7	39.2	36.9	32.8	32.8	37.5	35.9
NN	21	17	18	18	18	18	19	18	18	18	19	18
FS	6/11	6/11	6/11	6/11	6/18	6/18	6/18	6/18	6/30	6/30	6/30	6/30
FB	7/11	7/11	7/11	7/11	7/18	7/18	7/18	7/18	7/29	7/29	7/29	7/29
FOB	Sha.8	9/12	9/12	9/12	9/23	9/23	9/23	9/23	10/06	0/06	10/06	10/06
SO.	De119											
VAR												
YLD	2.46	2.58	2.52*	2.73*	2.39*	2.53*	2.24*	2.50*	1.49*	1.77*	1.36*	1.59*
MD	10/31	10/28	11/01	10/31	11/01	11/01	11/01	11/01	10/29	10/30	10/29	10/31
PHT	38.1	34.1	40.1	36.5	36.3	34.2	37.7	36.8	34.1	30.8	35.2	32.6
NN	22	21	22	21	21	20	21	21	20	19	20	19
FS	6/13	6/13	6/13	6/13	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01
FB	7/11	7/11	7/11	7/11	7/18	7/18	7/18	7/18	7/29	7/19	7/29	7/29
FOB	9/17	9/17	9/18	9/17	9/25	9/25	9/25	9/25	10/06	10/06	10/06	10/06
SO.	Dub.7											
VAR	Mid											
YLD	1.45*	1.54	1.68*	1.87	1.48*	1.52*	1.55*	1.74*	1.30*	1.41*	1.23*	1.48*
MD	11/01	10/26	10/31	11/01	11/01	11/01	11/01	11/01	11/01	11/01	11/01	11/01
PHT	43.5	41.6	50.1	44.7	46.3	43.1	50.5	46.7	46.7	43.3	48.3	47.4
NN	19	18	21	19	20	19	21	20	20	19	20	20
FS	6/11	6/11	6/11	6/11	6/18	6/18	6/18	6/18	6/30	6/30	6/30	6/30
FB	7/11	7/11	7/11	7/11	7/18	7/18	7/18	7/18	7/29	7/29	7/29	7/29
FOB	9/04	9/14	9/15	9/15	9/25	9/25	9/25	9/25	10/06	10/06	10/06	10/06
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tminm10.act Future weather: tminm10.cld

Table I-13. Predicted cotton responses using +1% deviation of average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	1.91	1.95	2.06*	2.05*	1.69	1.80	1.87*	1.90	1.25	1.36	1.32*	1.37
MD	10/23	9/23	11/01	10/27	10/15	10/02	11/01	10/28	10/30	10/27	11/01	10/31
PHT	41.1	36.1	44.4	39.2	42.0	37.7	45.8	40.4	18.7	31.7	35.6	33.17
NN	22	22	23	23	22	21	23	21	20	20	23	20
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	6/28	7/06	7/06	7/06	7/06	7/20	7/20	7/20	7/20
FOB	8/13	8/13	8/13	8/13	8/21	8/21	8/21	8/21	9/06	9/06	9/06	9/06
SO.	Sha.8											
VAR	Mid											
YLD	1.51	1.55	1.61	1.72	1.28	11.34	1.33	1.42	10.89	0.93	0.89	0.95
MD	9/27	9/17	10/07	9/22	10/15	9/25	10/29	10/06	11/01	10/23	11/01	10/29
PHT	52.7	49.2	60.6	54.6	53.9	47.8	60.2	52.8	42.0	41.7	43.8	42.9
NN	22	21	23	22	21	19	22	20	19	17	20	19
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/29	6/29	6/28	6/28	7/06	7/06	7/06	7/06	7/20	7/20	7/20	7/20
FOB	8/14	8/14	8/13	8/13	8/2	8/21	8/21	8/2	9/06	9/06	9/06	9/06
SO.	Sha.8											
VAR	De119											
YLD	2.23	2.25	2.50*	2.43*	2.05	2.17	2.27*	2.37	1.70	1.85	1.79*	1.83
MD	10/29	9/25	11/01	9/29	10/2	10/04	11/01	10/26	10/30	10/27	11/01	11/01
PHT	46.0	37.8	48.0	41.9	46.5	39.8	49.6	43.2	38.07	37.2	40.6	37.9
NN	24	23	24	24	23	21	24	22	22	21	24	21
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	6/28	7/06	7/06	7/06	7/06	7/20	7/20	7/20	7/20
FOB	8/13	8/13	8/13	8/13	8/21	8/21	8/21	8/21	9/06	9/06	9/06	9/06
SO.	Dub.7											
VAR	Mid											
YLD	1.90	1.90	1.96	2.04	1.58	1.64	1.63	1.81	1.20	1.25	1.26	1.36
MD	10/06	9/21	10/2	9/29	10/21	9/30	10/31	10/07	11/01	10/28	11/01	10/30
PHT	63.1	55.9	69.0	60.0	61.2	51.1	63.8	57.10	50.5	49.2	52.6	50.7
NN	23	22	24	23	22	20	22	21	20	19	21	20
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/29	6/29	6/28	6/28	7/06	7/06	7/06	7/01	7/20	7/20	7/20	7/20
FOB	8/14	8/14	8/13	8/13	8/21	8/21	8/21	8/21	9/06	9/06	9/06	9/06
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tminp01.act Future weather: tminp01.cld

Table I-14 Predicted cotton responses using +5% deviation of average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.50	0.49	0.47	0.44	0.57	0.55	0.49	0.49	0.36	0.30	0.33	0.31
MD	9/01	8/28	9/01	8/29	9/09	9/03	9/10	9/06	9/28	9/23	10/02	9/20
PHT	21.9	20.8	24.2	22.3	19.6	19.5	20.92	20.5	12.3	9.9	13.9	12.9
NN	17	15	17	16	17	14	18	15	17	15	17	16
FS	5/30	5/30	5/30	5/30	6/09	6/09	6/09	6/09	6/24	6/24	6/24	6/24
FB	6/22	6/22	6/22	6/22	7/02	7/02	7/02	7/02	7/17	7/17	7/17	7/17
FOB	8/01	8/01	8/01	8/01	8/11	8/11	8/11	8/11	8/29	8/29	8/29	8/29
SO.	Sha.8											
VAR	Mid											
YLD	0.27	0.26	0.25	0.25	0.39	0.35	0.37	0.35	0.20	0.15	0.19	0.17
MD	8/29	8/27	9/03	8/29	9/09	9/06	9/14	9/07	9/25	9/28	10/01	9/25
PHT	26.3	25.4	29.3	28.9	31.3	29.8	32.5	34.81	17.2	15.2	18.3	16.2
NN	16	15	17	16	18	17	18	18	19	17	20	17
FS	5/28	5/28	5/28	5/28	6/08	6/08	6/08	6/08	6/22	6/22	6/22	6/22
FB	6/21	6/21	6/21	6/21	7/02	7/02	7/02	7/02	7/16	7/16	7/16	7/16
FOB	7/31	7/31	7/31	7/31	8/11	8/11	8/11	8/11	8/28	8/28	8/28	8/28
SO.	Sha.8											
VAR	De119											
YLD	0.86	0.77	10.98	0.89	1.00	0.99	1.02	0.97	0.89	0.87	0.85	0.83
MD	9/04	8/29	9/09	9/02	9/18	9/13	9/21	9/12	10/19	9/28	10/26	10/03
PHT	27.5	25.1	30.1	27.0	27.3	25.7	30.3	28.60	24.5	24.2	26.2	26.0
NN	20	17	21	19	20	19	21	19	21	19	22	20
FS	5/30	5/30	5/30	5/30	6/09	6/09	6/09	6/09	6/24	6/24	6/24	6/24
FB	6/22	6/22	6/22	6/22	7/02	7/02	7/02	7/02	7/17	7/17	7/17	7/17
FOB	8/01	8/0	8/01	8/01	8/11	8/11	8/11	8/11	8/29	8/29	8/29	8/29
SO.	Dub.7											
VAR	Mid											
YLD	0.51	0.48	10.58	0.47	0.70	0.68	0.74	0.68	0.55	0.49	0.60	0.57
MD	9/01	8/28	9/03	8/29	9/15	9/10	9/17	9/13	10/12	9/29	10/26	10/07
PHT	35.4	34.6	38.2	37.8	37.8	37.4	42.4	39.4	32.0	31.3	35.8	35.1
NN	18	18	20	19	20	19	21	20	21	19	21	20
FS	5/28	5/28	5/28	5/28	6/08	6/08	6/08	6/08	6/22	6/22	6/22	6/22
FB	6/21	6/21	6/21	6/21	7/02	7/02	7/02	7/02	7/16	7/16	7/16	7/16
FOB	7/31	7/3	7/31	7/31	8/11	8/11	8/11	8/11	8/28	8/28	8/28	8/28
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tminp05.act Future weather: tminp05.cld

Table I-15. Predicted cotton responses using +10% deviation of average minimum temperature for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
30	38		30		38		30		38			
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.16	0.45	0.39	0.40	0.31	0.29	0.28	0.26	0.28	0.26	0.28	0.27
MD	8/27	8/23	8/30	8/27	9/04	8/31	9/05	9/02	9/18	9/18	9/20	9/17
PHT	21.8	20.7	21.3	22.4	12.9	11.8	13.3	13.0	10.6	8.0	11.9	10.5
NN	15	13	15	13	16	13	16	15	16	14	17	15
FS	5/29	5/29	5/29	5/29	6/08	6/08	6/08	6/08	6/23	6/23	6/23	6/23
FB	6/21	6/21	6/21	6/21	7/01	7/01	7/01	7/01	7/16	7/16	7/16	7/16
FOB	7/29	7/29	7/29	7/29	8/08	8/08	8/08	8/08	8/26	8/26	8/26	8/26
SO.	Sha.8											
VAR	Mid											
YLD	0.24	0.21	0.26	0.23	0.22	0.13	0.19	0.12	0.13	0.09	0.14	0.12
MD	8/27	8/25	8/28	8/27	9/07	9/15	9/07	9/18	9/22	9/19	9/23	9/21
PHT	30.9	30.3	33.4	31.9	22.2	21.6	21.5	21.8	12.0	10.4	14.7	12.1
NN	17	15	17	16	18	18	19	19	17	16	18	16
FS	527	5/27	5/27	5/27	6/07	6/07	6/07	6/07	6/22	6/22	6/22	6/22
FB	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01	7/17	7/17	7/17	7/17
FOB	7/28	7/28	7/28	7/28	8/08	8/08	8/08	8/08	8/27	8/27	8/27	8/27
SO.	Sha.8											
VAR	De119											
YLD	0.67*	0.64	0.66*	0.68*	0.60	0.56	0.64	0.57	0.82	0.73	0.88	0.79
MD	10/31	8/23	9/03	8/28	9/09	9/05	9/15	9/07	10/01	9/24	10/11	9/25
PHT	24.9	24.6	27.9	27.3	19.9	18.9	23.4	21.2	22.7	21.4	25.9	24.6
NN	19	17	20	18	19	17	20	18	22	19	22	21
FS	5/29	5/29	5/29	5/29	6/08	6/08	6/08	6/08	6/23	6/23	6/23	6/23
FB	6/21	6/21	6/21	6/21	7/01	7/01	7/01	7/01	7/16	7/16	7/16	7/16
FOB	7/29	7/29	7/29	7/29	8/08	8/08	8/08	8/08	8/26	8/26	8/26	8/26
SO.	Dub.7											
VAR	Mid											
YLD	0.42	0.37	0.45	0.43	0.43	0.34	0.42	0.32	0.52	0.43	0.53	0.46
MD	8/30	8/25	8/28	8/25	9/10	9/06	9/11	9/07	10/01	9/23	10/06	9/25
PHT	30.4	32.1	36.1	35.2	24.2	24.1	27.4	27.3	26.6	25.2	31.4	29.3
NN	19	17	20	19	19	17	19	18	20	18	21	19
FS	5/27	5/27	5/27	5/27	6/07	6/07	6/07	6/07	6/22	6/22	6/22	6/22
FB	6/20	6/20	6/20	6/20	7/01	7/01	7/01	7/01	7/17	7/17	7/17	7/17
FOB	7/28	7/28	7/28	7/28	8/08	8/08	8/08	8/08	8/27	8/27	8/27	8/27
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tminp10.act Future weather: tminp10.hot

Table I-16. Predicted cotton responses using average solar radiation for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.95	0.98	0.91	0.95	0.95	0.95/1	0.99	0.96	1.15	1.12	1.19	1.10
MD	9/10	9/04	9/17	9/05	9/29	4	10/14	9/19	10/27	10/23	11/01	10/26
PHT	24.7	22.0	27.7	25.3	23.6	23.9	27.5	26.0	24.7	24.6	29.0	28.6
NN	20	19	21	19	19	19	21	19	21	19	22	21
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/25	6/25	6/25	6/25
FB	6/26	6/26	6/26	6/26	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/11	8/11	8/11	8/11	8/22	8/22	8/22	8/22	9/04	9/04	9/04	9/04
SO.	Sha.8											
VAR	Mid											
YLD	0.64	0.67	0.63	0.65	0.62	0.66	0.67	0.65	0.76	0.67	0.71	0.66
MD	9/10	9/05	9/14	9/07	9/30	9/14	10/05	9/19	11/01	10/22	11/01	10/28
PHT	26.7	26.2	31.3	29.1	29.3	27.2	32.5	32.3	28.4	26.8	32.2	30.8
NN	19	19	20	19	19	18	19	19	18	17	19	18
FS	6/01	6/01	6/01	6/01	6/10	6/10	6/10	6/10	6/24	6/24	6/24	6/24
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/20	7/20	7/20	7/20
FOB	8/11	8/11	8/11	8/11	8/21	8/21	8/21	8/21	9/05	9/05	9/05	9/05
SO.	Sha.8											
VAR	De119											
YLD	1.57	1.50	1.67	1.47	1.75	1.57	1.98*	1.64	2.11*	1.95	2.02*	2.04*
MD	9/27	9/07	10/11	9/14	10/21	9/26	10/31	10/06	11/01	10/26	11/01	11/01
PHT	33.3	30.5	37.0	32.2	32.7	29.9	37.2	32.2	38.8	34.7	41.1	37.5
NN	21	19	22	20	22	19	23	20	25	22	15	22
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/25	6/25	6/25	6/25
FB	6/26	6/26	6/26	6/26	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/11	8/11	8/11	8/11	8/22	8/22	8/22	8/22	9/04	9/04	9/04	9/04
SO.	Dub.7											
VAR	Mid											
YLD	1.13	0.98	1.23	1.12	1.33	1.10	1.39	1.21	1.47	1.32	1.49*	1.44
MD	9/07	9/06	9/30	9/12	10/11	9/18	10/21	10/02	11/01	10/28	11/01	11/01
PHT	42.1	37.7	47.1	42.0	42.5	38.0	44.1	42.1	45.6	41.7	49.5	44.3
NN	20	18	22	19	21	19	21	20	22	20	22	20
FS	6/01	6/01	6/01	6/01	6/10	6/10	6/10	6/10	6/24	6/24	6/24	6/24
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/19	7/19	7/20	7/20
FOB	8/11	8/11	8/11	8/11	8/21	8/21	8/21	8/21	9/04	9/04	9/05	9/05
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solar00.act Future weather: solar00.nor

Table I-17. Predicted cotton responses using -10% deviation of average solar radiation for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.77	2.74	3.63*	3.49	2.78	2.73	3.52*	3.47	2.78*	2.70	2.89*	3.27
MD	10/05	9/21	11/01	10/08	10/31	10/15	10/31	10/26	11/01	10/29	11/01	11/01
PHT	47.3	40.1	56.6	48.4	43.7	37.8	50.3	44.8	46.3	40.3	54.3	45.3
NN	22	19	26	24	21	19	24	23	21	19	25	22
FS	6/03	6/03	6/03	6/03	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/08	7/08	7/08	7/08	7/21	7/21	7/21	7/21
FOB	8/19	8/19	8/19	8/19	8/27	8/27	8/27	8/27	9/11	9/11	9/11	9/11
SO.	Sha.8											
VAR	Mid											
YLD	2.44	2.20*	2.83*	2.26*	2.45*	2.12*	2.71*	2.53*	2.44*	2.27	2.61*	2.62*
MD	10/28	9/26	11/01	10/31	11/01	10/21	10/31	11/01	11/01	11/01	11/01	11/01
PHT	61.2	60.6	94.6	86.5	65.9	64.3	85.9	74.2	70.8	57.8	79.7	65.9
NN	22	23	30	29	23	24	29	27	23	21	26	24
FS	6/01	6/01	6/01	6/01	6/10	6/10	6/10	6/10	6/25	6/25	6/25	6/25
FB	6/28	6/29	6/28	6/28	7/07	7/07	7/07	7/08	7/22	7/22	7/21	7/21
FOB	8/19	8/19	8/19	8/19	8/26	8/26	8/27	8/27	9/13	9/13	9/11	9/11
SO.	Sha.8											
VAR	De119											
YLD	2.86	2.83	3.65*	3.55*	2.85	2.76	3.50*	3.47	2.83*	2.81	2.89*	3.23*
MD	10/05	9/23	11/01	10/14	10/29	10/15	10/31	10/26	11/01	10/29	11/01	10/30
PHT	47.3	40.1	56.8	50.4	47.2	38.3	50.9	44.8	46.4	40.4	55.8	44.6
NN	22	19	26	25	22	19	24	23	21	19	26	23
FS	6/03	6/03	6/03	6/03	6/11	6/11	6/11	6/11	6/26	6/29	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/08	7/08	7/08	7/08	7/21	7/21	7/21	7/21
FOB	8/19	8/19	8/19	8/19	8/27	8/27	8/27	8/27	9/11	9/11	9/11	9/11
SO.	Dub.7											
VAR	Mid											
YLD	2.05	2.19*	2.82*	2.28*	2.50*	2.13*	2.73*	2.53*	2.50*	2.29	2.63*	2.62*
MD	10/28	9/28	11/01	11/01	10/31	10/20	11/01	11/01	11/01	11/01	11/01	11/01
PHT	64.5	61.7	95.1	87.5	67.9	65.4	86.3	74.2	70.8	58.0	80.1	66.3
NN	23	23	30	29	23	24	29	27	23	21	26	24
FS	6/01	6/01	6/01	6/01	6/10	6/10	6/10	6/10	6/25	6/25	6/25	6/25
FB	6/28	6/28	6/28	6/28	7/07	7/07	7/08	7/08	7/22	7/22	7/21	7/21
FOB	8/19	8/19	8/19	8/19	8/26	8/26	8/27	8/27	9/13	9/13	9/11	9/11
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solarm10.act Future weather: solarm10.cld

Table I-18. Predicted cotton responses using -25% deviation of average solar radiation for three emergence dates, two row spacings, and two plant populations.

EMERGENCE DATE												
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
30	38		30		38		30		38			
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.47	2.30	2.90*	2.76	2.67	2.46	3.11	2.68	2.60*	2.61	2.488	2.72*
MD	10/02	9/24	10/30	9/27	10/26	9/30	11/01	10/21	10/31	10/23	11/01	11/01
PHT	46.4	38.9	60.6	45.1	50.9	38.3	61.3	52.3	49.2	42.1	16	47.8
NN	21	18	28	21	23	20	28	26	24	21	51.6	24
FS	6/05	6/05	6/05	6/05	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/30	6/30	6/30	6/30	7/07	7/07	7/07	7/07	7/19	7/19	7/19	7/19
FOB	8/20	8/20	8/20	8/20	8/29	8/30	8/30	8/30	9/16	9/16	9/16	9/16
SO.	Sha.8											
VAR	Mid											
YLD	2.18	1.89	2.43*	2.07*	2.26*	1.78*	2.45*	1.81*	2.15*	1.82	2.11*	1.99*
MD	11/01	9/30	11/01	10/05	11/01	10/08	11/01	11/01	11/01	11/01	11/01	10/31
PHT	74.5	68.3	83.0	79.1	77.0	76.0	83.5	80.5	66.2	63.3	75.0	64.6
NN	25	24	28	28	25	26	28	28	24	24	26	24
FS	6/03	6/03	6/03	6/03	6/11	6/11	6/11	6/11	6/24	6/24	6/24	6/24
FB	6/29	6/29	6/29	6/29	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/19	8/19	8/19	8/19	8/29	8/29	8/29	8/29	9/16	9/16	9/16	9/16
SO.	Sha.8											
VAR	De119											
YLD	2.55	2.33	2.92*	2.89	2.79	2.49	3.12*	2.28*	2.67*	2.66	2.49*	2.72*
MD	10/02	9/24	10/31	9/27	10/26	9/30	11/01	10/19	10/31	10/23	11/01	11/01
PHT	46.4	38.8	62.0	45.1	50.9	39.3	62.2	47.5	49.6	42.2	52.7	47.9
NN	21	18	29	21	23	21	29	25	24	21	26	24
FS	6/05	6/05	6/03	6/03	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/30	6/30	6/29	6/30	7/06	7/07	7/07	7/07	7/19	7/07	7/19	7/19
FOB	8/20	8/20	8/20	8/20	8/29	8/30	8/30	8/30	9/16	8/30	9/16	9/16
SO.	Dub.7											
VAR	Mid											
YLD	2.20*	1.89*	2.42*	2.06*	2.28*	1.86*	2.47*	1.81*	2.18*	1.83	2.13*	2.01*
MD	11/01	9/30	11/01	10/05	11/01	10/08	11/01	11/01	11/01	11/01	11/01	10/31
PHT	76.6	65.3	85.1	81.5	78.9	71.6	83.4	80.7	68.9	63.9	75.5	64.9
NN	26	24	29	28	26	26	28	28	25	24	26	24
FS	6/03	6/03	6/03	6/03	6/11	6/11	6/11	6/11	6/24	6/24	6/24	6/24
FB	6/29	6/29	6/29	6/29	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/19	8/19	8/19	8/19	8/29	8/29	8/29	8/29	9/16	9/16	9/16	9/16
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solarm25.act Future weather: solarm25.cld

Table I-19. Predicted cotton responses using -50% deviation of average solar radiation for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	1.99	1.86	2.26*	2.03	2.20*	2.16	2.33*	2.24	1.97*	2.04	1.91*	2.12*
MD	10/22	10/08	10/30	10/08	11/01	10/18	11/01	10/23	10/31	11/01	10/31	11/01
PHT	41.2	33.3	51.6	37.2	43.1	35.0	52.9	41.3	46.1	36.2	51.1	41.6
NN	20	18	24	20	21	18	25	22	21	18	23	21
FS	6/05	6/05	6/05	6/05	6/14	6/14	6/14	6/14	6/28	6/28	6/28	6/25
FB	7/02	7/02	7/02	7/02	7/10	7/10	7/10	7/10	7/25	7/25	7/25	7/25
FOB	8/25	8/25	8/25	8/25	9/05	9/05	9/05	9/05	10/02	10/02	10/02	10/02
SO.	Sha.8											
VAR	Mid											
YLD	1.85	1.37*	2.07*	1.66*	2.05*	1.68	2.08*	1.49	1.72*	1.49	1.68*	1.68*
MD	11/01	10/30	10/31	11/01	10/30	10/20	10/31	11/01	10/31	11/01	11/01	10/31
PHT	64.1	60.2	70.1	61.0	61.6	57.2	66.8	51.1	66.8	51.1	67.8	56.7
NN	22	23	25	23	23	22	23	20	23	20	23	21
FS	6/04	6/05	0/04	6/04	6/13	6/13	6/27	6/27	6/27	6/27	6/28	6/27
FB	7/02	7/03	7/03	7/03	7/11	7/11	7/24	7/24	7/24	7/24	7/25	7/25
FOB	8/25	8/26	8/26	8/26	9/07	9/07	9/30	9/30	9/30	9/30	10/02	10/02
SO.	Sha.8											
VAR	De119											
YLD	1.90	1.75	2.18	1.95	2.14*	2.08	2.27*	2.20	1.92*	1.94	1.92*	2.05*
MD	10/22	10/08	10/30	10/08	11/01	10/18	11/01	10/23	10/31	10/31	10/31	11/01
PHT	41.2	33.3	49.1	35.2	43.1	35.0	51.5	38.5	44.8	36.3	51.1	38.9
NN	20	18	23	19	21	18	24	20	20	18	23	19
FS	6/05	6/05	6/05	6/05	6/14	6/14	6/14	6/14	6/28	6/28	6/28	6/25
FB	7/02	7/02	7/02	7/02	7/10	7/10	7/10	7/10	7/25	7/25	7/25	7/25
FOB	8/25	8/25	8/25	8/25	9/05	9/05	9/05	9/05	10/02	10/02	10/02	10/02
SO.	Dub.7											
VAR	Mid											
YLD	1.77	1.38*	2.08*	1.66*	2.01*	1.68	2.09*	1.78	1.72*	1.49	1.69*	1.61*
MD	11/01	10/30	10/31	11/01	10/30	10/20	11/01	10/23	10/31	11/01	11/01	11/01
PHT	64.1	56.8	70.0	60.9	59.8	57.2	69.6	63.4	66.8	51.1	67.8	57.2
NN	22	22	25	23	22	22	25	24	23	20	23	21
FS	6/04	6/04	6/04	6/04	6/13	6/13	6/13	7/11	6/27	6/27	6/27	6/27
FB	7/02	6/03	7/03	7/03	7/11	7/11	7/11	7/11	7/24	7/24	7/25	7/25
FOB	8/25	8/26	8/26	8/26	9/07	9/07	9/07	9/07	9/30	9/30	10/02	10/02
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solarm50.act Future weather: solarm50.cld

Table I-20. Predicted cotton responses using +10% deviation of average solar radiation for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
30	38		30		38		30		38			
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.24	0.24	0.22	0.23	0.31	0.30	0.28	0.58	0.40	0.41	0.37	0.36
MD	9/04	8/28	9/03	8/30	9/19	9/10	9/11	9/11	10/14	9/26	10/20	10/11
PHT	12.1	11.0	13.4	12.7	12.0	11.5	14.0	21.6	10.8	10.6	11.9	10.9
NN	14	13	15	14	15	13	15	17	15	14	16	14
FS	5/30	5/30	5/30	5/30	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/24	6/24	6/24	6/24	7/05	7/03	7/05	7/05	7/19	7/19	7/19	7/19
FOB	8/09	8/09	8/09	8/09	8/21	8/21	8/21	8/21	9/05	9/05	9/05	9/05
SO.	Sha.8											
VAR	Mid											
YLD	0.12	0.07	0.10	0.08	0.14	0.07	10.15	0.31	0.24	0.18	0.22	0.17
MD	9/02	8/27	9/06	8/29	9/19	9/12	9/19	9/19	10/25	10/25	10/26	10/22
PHT	14.4	13.9	16.5	16.0	14.9	13.8	19.1	28.3	17.2	16.0	17.6	16.6
NN	15	15	16	15	16	15	17	17	17	16	17	16
FS	5/29	5/29	5/29	5/29	6/10	6/10	6/10	6/10	6/24	6/24	6/24	6/24
FB	6/24	6/24	6/24	6/24	7/05	7/05	7/05	7/05	7/19	7/19	7/19	7/19
FOB	8/09	8/09	8/09	8/09	8/21	8/2	8/21	8/21	9/05	9/05	9/05	9/05
SO.	Sha.8											
VAR	De119											
YLD	0.54	0.52	0.52	0.51	0.60	0.59	0.64	0.58	0.94	0.89	1.01*	0.85
MD	9/08	8/30	9/07	8/31	9/19	9/11	9/22	9/11	10/29	10/14	10/31	10/14
PHT	20.9	20.8	23.4	22.9	20.2	19.7	22.6	21.6	20.5	19.6	23.5	21.7
NN	18	16	19	17	18	16	20	17	21	18	22	19
FS	5/30	5/30	5/30	5/30	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/24	6/24	6/24	6/24	7/05	7/05	7/05	7/05	7/19	7/19	7/19	7/19
FOB	8/09	8/09	8/09	8/09	8/21	8/21	8/21	8/21	9/05	9/05	9/05	9/05
SO.	Dub.7											
VAR	Mid											
YLD	0.35	0.28	0.33	0.29	0.36	0.31	0.35	0.31	0.53	0.49	0.61	0.46
MD	9/07	9/02	9/09	9/03	9/21	9/17	9/22	9/19	10/30	10/26	11/01	10/27
PHT	25.7	23.8	28.8	28.1	25.9	25.0	27.6	28.3	24.9	25.7	28.6	28.6
NN	17	16	18	16	18	16	18	17	19	17	19	18
FS	5/29	5/29	5/29	5/29	6/10	6/10	6/10	6/10	6/24	6/24	6/24	6/24
FB	6/24	6/24	6/24	6/24	7/05	7/05	7/05	7/05	7/19	7/19	7/19	7/19
FOB	8/09	8/09	8/09	8/09	8/21	8/21	8/21	8/21	9/05	9/05	9/05	9/05
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solarp10.act Future weather: solarp10.hot

Table I-21. Predicted cotton responses using +25% deviation of average solar radiation for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.35	0.33	0.38	0.39	0.47	0.50	0.61	0.72	0.53	0.56	0.58	0.57
MD	8/28	8/24	8/30	8/28	9/12.	9/02	9/23	9/06	10/28	10/23	10/31	10/26
PHT	6.3	5.0	7.6	6.8	3	8.9	14.7	11.2	15.2	14.7	17.6	17.4
NN	14	11	15	14	18	15	20	17	17	16	18	17
FS	6/03	6/03	6/03	6/03	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	6/30	6/30	6/30	6/30	7/07	7/07	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/15	8/15	8/15	8/15	8/23	8/23	8/23	8/23	9/06	9/06	9/06	9/06
SO.	Sha.8											
VAR	Mid											
YLD	0.20	0.18	0.21	0.19	0.28	0.22	0.36	0.32	0.27	0.24	0.30	0.28
MD	9/01	10/28	8/31	10/28	9/15	9/08	9/22	9/13	10/29	10/24	10/30	10/26
PHT	9.5	11.1	11.5	12.6	12.8	11.3	16.6	13.7	18.0	16.6	19.9	19.4
NN	19	17	20	18	20	18	21	20	18	15	17	16
FS	6/01	6/01	6/01	6/01	6/10	6/10	6/10	6/10	6/26	6/26	6/26	6/26
FB	6/30	6/30	6/30	6/30	7/06	7/06	7/06	7/06	7/21	7/21	7/21	7/21
FOB	8/15	8/15	8/15	8/15	8/22	8/22	8/22	8/22	9/07	9/07	9/07	9/07
SO.	Sha.8											
VAR	De119											
YLD	0.61	0.60	0.63	0.66	0.62	0.67	0.62	0.65	0.96	0.86	1.18*	1.05
MD	9/09	9/04	9/13	9/07	9/28	9/14	9/28	9/14	10/31	10/26	10/31	10/30
PHT	16.8	15.0	20.3	18.4	20.0	19.7	23.7	22.8	21.4	21.0	26.2	24.0
NN	17	16	18	17	19	17	20	18	20	18	22	20
FS	6/03	6/03	6/03	6/03	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	6/30	6/30	6/30	6/30	7/02	7/02	7/02	7/02	7/20	7/20	7/20	7/20
FOB	8/16	8/16	8/16	8/16	8/23	8/23	8/23	8/23	9/06	9/06	9/06	9/06
SO.	Dub.7											
VAR	MId											
YLD	0.41	0.32	0.43	0.37	0.43	0.45	0.42	0.44	0.49	0.42	0.65	0.60
MD	9/08	9/02	9/11	9/04	9/26	9/16	9/28	9/17	11/01	10/27	10/31	10/30
PHT	18.4	17.3	22.9	20.5	22.3	22.9	26.4	25.6	24.4	24.0	28.2	27.6
NN	18	16	18	16	18	17	19	17	17	16	18	17
FS	6/01	6/01	6/01	6/01	6/10	6/10	6/10	6/10	6/26	6/26	6/26	6/26
FB	6/30	6/30	6/30	6/30	7/06	7/06	7/06	7/06	7/21	7/21	7/21	7/21
FOB	8/15	8/15	8/15	8/15	8/22	8/22	8/22	8/22	9/07	9/07	9/07	9/07
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solarp25.act Future weather: solarp25.hot

Table I-22. Predicted cotton responses using +50% deviation of average solar radiation for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.38	0.33	0.41	0.37	0.52	0.67	0.72	0.79	0.52	0.58	0.63	0.58
MD	8/30	8/24	9/01	8/28	9/15	9/04	9/30	9/07	10/29	10/25	11/01	10/25
PHT	6.1	4.6	7.7	6.5	8.3	7.6	13.9	9.9	15.4	14.7	17.8	17.1
NN	14	11	16	13	16	14	19	17	17	16	19	16
FS	6/02	6/02	6/02	6/02	6/10	6/10	6/10	6/20	6/27	6/27	6/27	6/27
FB	6/29	6/29	6/29	6/29	7/05	7/05	7/05	7/05	7/20	7/20	7/20	7/20
FOB	8/16	8/16	8/16	8/16	8/23	8/23	8/23	8/23	9/10	9/10	9/10	9/10
SO.	Sha.8											
VAR	Mid											
YLD	0.18	0.19	0.24	0.12	0.28	0.20	0.34	0.26	0.22	0.22	0.29	0.28
MD	9/09	10/29	9/03	9/20	9/21	9/07	9/27	9/11	10/27	10/24	10/31	10/25
PHT	11.2	11.4	10.3	15.7	12.1	9.8	14.9	12.2	17.6	16.5	20.3	19.3
NN	19	18	20	21	19	18	20	19	16	15	18	15
FS	5/31	5/31	5/31	5/31	6/08	6/08	6/08	6/08	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	6/28	7/05	7/05	7/05	7/05	7/21	7/21	7/21	7/21
FOB	8/15	8/15	8/15	8/15	8/23	8/23	8/23	8/23	9/10	9/10	9/10	9/10
SO.	Sha.8											
VAR	De119											
YLD	0.61	0.67	0.67	0.71	0.65	0.72	0.67	0.70	1.00	0.88	1.16*	1.02
MD	9/16	9/06	9/26	9/11	10/04	9/21	10/06	9/28	11/01	10/25	11/01	10/31
PHT	17.9	15.1	20.8	20.0	19.8	18.9	22.9	22.5	21.6	21.3	25.8	24.0
NN	18	16	18	17	18	17	18	17	20	18	21	19
FS	6/02	6/02	6/02	6/02	6/10	6/10	6/10	6/10	6/27	6/27	6/27	6/27
FB	6/29	6/29	6/29	6/29	7/05	7/05	7/05	7/05	7/20	7/20	7/20	7/20
FOB	8/16	8/16	8/16	8/16	8/23	8/23	8/23	8/23	9/10	9/10	9/10	9/10
SO.	Dub.7											
VAR	MId											
YLD	.42	0.33	0.49	0.41	0.50	0.47	0.49	0.46	0.51	0.38	0.61	0.52
MD	9/11	9/02	9/15	9/06	9/30	9/22	10/07	9/23	10/31	10/27	11/01	10/30
PHT	17.6	16.3	22.2	19.2	21.6	22.1	26.1	25.2	24.3	23.9	27.9	27.6
NN	18	16	18	16	17	17	18	17	17	16	18	17
FS	5/31	5/31	5/31	5/31	6/08	6/08	6/08	6/08	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	5/28	7/05	7/05	7/05	7/05	7/21	7/21	7/21	7/21
FOB	8/15	8/15	8/15	8/15	8/23	8/23	8/23	8/23	9/11	9/11	9/11	9/11
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: solarp50.act Future weather: solarp50.hot

Table I-23. Predicted cotton responses using average rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	1.55	1.56	1.62	1.48	1.41	1.32	1.25	1.14	1.48	1.41	1.27	1.24
MD	9/29	9/10	9/30	9/114	10/10	9/21	10/28	9/23	11/01	10/30	11/01	10/30
PHT	29.1	26.2	33.0	30.1	26.3	24.5	29.2	28.0	28.9	26.6	31.4	29.6
NN	21	19	22	19	20	18	21	20	24	21	24	21
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/21	7/21	7/21	7/21
FOB	8/15	8/15	8/15	8/15	8/28	8/27	8/28	8/28	9/11	9/11	9/11	9/11
SO.	Sha.8											
VAR	Mid											
YLD	1.03	0.90	1.01	1.02	0.84	0.77	0.94	0.91	0.91	0.82	0.92*	0.89
MD	9/20	9/11	9/24	9/14	10/07	9/23	10/11	10/04	11/01	10/26	11/01	11/01
PHT	36.7	31.7	41.6	38.1	33.4	32.6	37.8	36.7	35.3	29.4	36.4	33.7
NN	21	18	21	19	19	18	21	19	19	17	20	18
FS	5/31	5/31	5/31	5/31	6/10	6/10	6/10	6/10	6/25	6/25	6/25	6/25
FB	6/26	6/26	6/26	6/26	7/04	7/04	7/05	7/05	7/22	7/22	7/22	7/22
FOB	8/14	8/14	8/14	8/14	8/26	8/26	8/27	8/27	9/12	9/12	9/12	9/12
SO.	Sha.8											
VAR	De119											
YLD	2.44	2.44	2.86	2.78	2.47	2.45	2.74	2.68	2.29	2.33	2.51	2.66
MD	10/04	9/18	10/27	9/23	11/01	10/02	11/01	10/10	11/01	10/27	11/01	11/01
PHT	37.0	32.4	41.9	35.4	39.3	32.8	43.8	35.3	40.4	34.6	44.1	38.9
NN	21	18	24	22	22	20	25	22	23	20	25	23
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/21	7/22	7/21	7/21
FOB	8/15	8/15	8/15	8/15	8/28	8/28	8/28	8/28	9/12	9/12	9/12	9/12
SO.	Dub.7											
VAR	Mid											
YLD	1.78	1.83	1.95	2.02	1.75	1.74	1.86	1.90	1.976	1.68	1.94	1.86
MD	9/30	9/18	10/11	9/26	10/29	9/26	10/31	10/09	11/01	11/01	11/01	10/31
PHT	51.5	44.9	57.1	47.5	50.1	47.1	57.2	50.2	40.4	42.	52.0	45.0
NN	22	20	25	21	22	21	23	22	23	20	22	20
FS	5/31	5/31	5/31	5/31	6/10	6/10	6/10	6/10	6/26	6/26	6/25	6/25
FB	6/27	6/27	6/26	6/26	7/04	7/04	7/0548	7/04	7/21	7/21	7/22	7/22
FOB	8/16	8/16	8/15	8/15	8/27	8/27	/27	8/27	9/12	9/12	9/12	9/12
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: rain00.act Future weather: rain00.nor

Table I-24. Predicted cotton responses using -0.25 inch less (-0.25) than mean rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.52	0.48	0.50	0.45	0.51	0.51	0.46	0.44	0.56	0.54	0.53	0.49
MD	9/11	9/03	9/14	9/03	9/17	9/17	9/19	9/17	10/10	9/30	10/13	10/08
PHT	20.8	20.2	25.0	22.7	18.4	17.8	19.8	18.4	16.5	14.0	18.5	16.3
NN	16	16	17	15	16	14	17	14	19	15	20	18
FS	6/02	6/02	6/02	6/01	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/26	6/26	6/26	6/25	7/05	7/05	7/05	7/05	7/18	7/18	7/18	7/18
FOB	8/11	8/11	8/11	8/11	8/20	8/20	8/20	8/20	9/06	9/06	9/06	9/06
SO.	Sha.8											
VAR	Mid											
YLD	0.26	0.24	0.28	0.24	0.28	0.2	0.27	0.22	0.33	0.27	0.30	0.23
MD	9/09	9/07	9/10	9/07	9/19	9/11	9/26	9/17	10/13	10/08	10/18	9/29
PHT	27.0	23.8	27.1	26.2	23.3	22.1	25.3	22.6	18.6	18.7	20.8	18.7
NN	16	15	17	15	17	15	17	15	17	16	17	16
FS	5/31	5/31	5/31	5/31	6/10	6/10	6/10/0	6/10	6/23	6/23	6/23	6/23
FB	6/26	6/26	6/26	6/26	7/05	7/05	5	7/05	7/17	7/17/0	7/17	7/17
FOB	8/12	8/12	8/11	8/11	8/20	8/20	8/20	8/20	9/03	3	9/03	9/03
SO.	Sha.8											
VAR	De119											
YLD	1.08	0.93	1.19	0.89	1.27	1.15	1.18	1.08	1.46*	1.32	1.40*	1.28
MD	9/1	9/05	9/30	9/06	10/09	9/25	6/11	9/25	11/01	10/19	11/01	10/24
PHT	27.3	27.1	30.3	28.3	26.9	24.1	29.5	26.5	28.2	27.3	31.2	30.6
NN	19	17	20	18	20	18	21	19	22	20	23	21
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/26	6/26	6/26	6/26	7/05	7/05	7/05	7/05	7/18	7/18	7/18	7/18
FOB	8/11	8/12	8/12	8/12	8/20	8/20	8/20	8/20	9/06	9/06	9/06	9/06
SO.	Dub.7											
VAR	Mid											
YLD	0.60	0.55	0.76	0.58	0.95	0.69	0.92	0.85	0.93	0.84	0.97*	0.77
MD	9/14	9/04	9/20	9/08	10/08	9/18	10/12	9/25	11/01	10/20	11/01	10/20
PHT	34.0	33.6	36.1	35.8	32.4	29.1	35.9	32.1	33.9	31.5	36.9	34.4
NN	18	17	20	18	20	17	20	18	19	18	20	18
FS	5/31	5/31	5/31	5/31	6/10	6/10	6/10	6/10	6/23	6/23	6/23	6/23
FB	6/25	6/25	6/26	6/26	7/05	7/05	7/05	7/05	7/17	7/17	7/17	7/17
FOB	8/11	8/11	8/11	8/11	8/20	8/20	8/20	8/20	9/03	9/03	9/03	9/03
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: rainm025.act Future weather: rainm025.hot

Table I-25. Predicted cotton responses using –0.50 inch less (–0.50) than mean rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.31	0.29	0.28	0.28	0.40	0.39	0.34	0.35	0.50	0.49	0.45	0.44
MD	9/07	9/01	9/10	9/01	9/17	9/12	9/17	9/12	10/02	9/29	10/13	9/29
PHT	14.0	12.7	15.4	14.7	13.1	13.3	13.9	14.3	13.8	13.1	15.0	13.7
NN	15	14	16	14	16	14	16	14	18	17	19	16
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/30	6/30	6/30	6/30	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/14	8/14	8/14	8/14	8/22	8/22	8/22	8/22	9/09	9/09	9/09	9/09
SO.	Sha.8											
VAR	Mid											
YLD	0.14	0.12	0.13	0.12	0.22	0.18	0.20	0.18	0.30	0.25	0.28	0.22
MD	9/10	9/07	9/09	9/08	9/17	9/15	9/22	9/13	10/27	10/01	10/27	10/04
PHT	15.7	14.9	19.6	16.8	17.2	14.8	17.7	17.5	19.8	17.6	21.6	18.9
NN	16	15	17	15	16	15	17	16	18	16	19	17
FS	6/02	6/02	6/02	6/02	6/10	6/10	6/10	6/10	6/24	6/24	6/24	6/24
FB	6/30	6/30	6/30	6/30	7/06	7/06	7/06	7/06	7/18	7/18	7/18	7/18
FOB	8/14	8/14	8/13	8/13	8/22	8/22	8/22	8/22	9/08	9/08	9/08	9/08
SO.	Sha.8											
VAR	De119											
YLD	0.83	0.76	0.84	0.75	1.16	1.02	1.13	1.03	1.45*	1.39	1.39*	1.22
MD	9/17	9/03	9/16	9/09	10/10	9/22	10/10	9/29	11/01	10/19	11/01	10/22
PHT	24.7	24.2	26.3	25.6	27.0	22.0	27.0	24.6	25.9	24.6	28.6	26.0
NN	19	17	20	18	21	18	21	17	22	20	24	20
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/30	6/30	6/30	6/30	7/06	7/06	7/06	7/06	7/19	7/19	7/19	7/19
FOB	8/14	8/14	8/14	8/13	8/22	8/22	8/22	8/22	9/09	9/09	9/09	9/09
SO.	Dub.7											
VAR	Mid											
YLD	0.51	0.40	0.46	0.39	0.69	0.58	0.68	0.55	0.91	0.87	0.91	0.83
MD	9/10	9/08	9/15	9/08	9/26	9/18	10/02	9/23	11/01	10/26	11/01	10/31
PHT	30.8	32.3	34.7	34.6	32.0	30.8	33.7	32.4	34.4	33.4	37.0	35.0
NN	17	17	18	18	20	17	20	18	20	19	21	19
FS	6/02	6/02	6/02	6/02	6/10	6/10	6/10	6/10	6/24	6/24	6/24	6/24
FB	6/30	6/30	6/30	6/30	7/06	7/06	7/06	7/06	7/18	7/18	7/18	7/18
FOB	8/14	8/14	8/14	8/14	8/22	8/22	8/22	8/22	9/08	9/08	9/08	9/08
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: tsinm05.act Future weather: rainm05.hot

Table I-26. Predicted cotton responses using -1.00 inch less (-1.00) than mean rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.21	0.20	0.19	0.18	0.24	0.23	0.22	0.22	0.39	0.40	0.37	0.38
MD	9/02	9/04	9/04	9/04	9/12	9/16	9/22	9/13	10/16	10/10	10/16	10/18
PHT	9.8	8.4	10.8	9.5	8.7	8.0	9.4	8.8	10.8	10.5	12.7	11.9
NN	13	12	14	13	16	14	16	14	16	15	17	15
FS	6/04	6/04	6/04	6/04	6/12	6/13	6/12	6/12	6/27	6/27	6/27	6/27
FB	7/01	7/01	7/01	7/01	7/07	7/07	7/07	7/07	7/22	7/22	7/22	7/22
FOB	8/16	8/16	8/16	8/16	8/25	8/25	8/25	8/25	9/13	9/13	9/13	9/13
SO.	Sha.8											
VAR	Mid											
YLD	0.10	0.04	0.10	0.06	0.14	0.09	0.12	0.10	0.17	0.15	0.17	0.15
MD	9/08	9/05	9/05	9/05	9/19	9/25	9/25	9/19	10/27	10/18	10/27	10/16
PHT	12.1	11.8	14.8	13.9	13.1	12.4	13.27	12.9	12.6	11.9	15.0	13.5
NN	16	14	16	14	16	15	17	15	16	15	17	16
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/30	6/30	6/30	6/30	7/07	7/07	7/07	7/07	7/23	7/23	7/23	7/23
FOB	8/16	8/16	8/16	8/16	8/25	8/25	8/25	8/25	9/14	9/14	9/14	9/14
SO.	Sha.8											
VAR	De119											
YLD	0.61	0.59	0.60	0.57	0.74	0.71	0.68	0.67	1.07	0.96	1.09*	0.94
MD	9/20	9/09	9/24	9/09	9/29	9/25	10/03	9/28	10/31	10/20	10/31	10/27
PHT	19.0	17.9	22.3	20.0	20.7	19.7	23.3	22.4	23.4	22.5	25.1	24.1
NN	18	16	19	17	19	17	20	18	21	19	22	19
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	7/01	7/01	7/01	7/01	7/07	7/07	7/07	7/07	7/22	7/22	7/22	7/22
FOB	8/17	8/17	8/17	8/17	8/25	8/25	8/25	8/25	9/14	9/14	9/14	9/14
SO.	Dub.7											
VAR	Mid											
YLD	0.41	0.29	0.42	0.31	0.51	0.42	0.47	50.40	0.59	0.51	0.62*	0.52
MD	9/18	9/08	9/18	9/12	10/05	9/24	10/03	9/27	11/01	10/27	10/31	10/29
PHT	22.3	21.0	26.4	23.8	25.7	23.5	29.0	27.7	27.0	25.9	29.2	29.0
NN	17	16	18	17	19	17	19	18	19	17	19	18
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/30	6/30	6/30	6/30	7/07	7/07	7/07	7/07	7/23	7/23	7/23	7/23
FOB	8/16	8/16	8/16	8/16	8/25	8/25	8/24	8/25	9/14	9/14	9/14	9/14
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: rainm10.act Future weather: rainm10.hot

Table I-27. Predicted cotton responses using 1.00 inch more (+1.00) than mean rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.76	2.56	3.37	3.20	2.88	2.68	3.53*	3.36	2.74*	2.72	3.04*	3.44*
MD	10/22	10/02	10/31	10/17	10/29	10/17	11/01	10/23	10/30	10/28	10/30	11/01
PHT	48.6	39.3	62.5	47.8	49.0	41.8	61.7	46.8	49.5	41.6	56.9	50.3
NN	21	18	27	22	21	19	26	21	21	19	25	23
FS	6/09	6/09	6/09	6/09	6/16	6/16	6/16	6/16	6/26	6/26	6/26	6/26
FB	7/04	7/04	7/04	7/04	7/10	7/10	7/10	7/10	7/20	7/20	7/20	7/20
FOB	8/20	8/20	8/20	8/20	8/28	8/28	8/28	8/28	9/13	9/13	9/13	9/13
SO.	Sha.8											
VAR	Mid											
YLD	2.55	2.23	2.97*	2.44*	2.58	2.43	3.06	2.75*	2.78*	2.27	2.73*	2.58*
MD	10/23	10/11	11/01	11/01	10/31	10/22	11/01	10/28	10/30	11/01	11/01	10/31
PHT	173.0	67.2	89.1	84.6	74.4	60.1	87.5	76.2	49.5	57.3	82.1	70.6
NN	23	23	28	28	23	20	28	26	22	20	26	25
FS	6/08	6/08	6/08	6/08	6/15	6/15	6/15	6/15	6/25	6/25	6/25	6/25
FB	7/04	7/04	7/05	7/05	7/11	7/11	7/11	7/11	7/20	7/20	7/20	7/20
FOB	8/20	8/20	8/22	8/22	8/30	8/30	8/30	8/30	9/13	9/13	9/13	9/13
SO.	Sha.8											
VAR	De119											
YLD	2.90	2.63	3.38*	3.28	2.99	2.80	3.66*	3.53	2.78*	2.75	3.04	3.46*
MD	18.82	10/02	10/31	10/16	10/29	10/71	11/01	10/23	10/30	10/27	10/30	11/01
PHT	47.9	0.3	64.6	46.2	50.6	41.8	63.1	46.8	49.5	40.8	56.9	48.8
NN	21	18	28	22	22	18	27	21	21	19	26	22
FS	6/09	6/09	6/09	6/09	6/16	6/16	6/16	6/16	6/26	6/26	6/26	6/26
FB	7/04	7/04	7/04	7/04	7/10	7/10	7/10	7/10	7/20	7/20	7/20	7/20
FOB	8/20	8/20	8/20	8/20	8/28	8/28	8/28	8/28	9/13	9/13	9/13	9/13
SO.	Dub.7											
VAR	Mid											
YLD	2.65	2.26	3.00*	2.44*	3.00*	2.47	3.07*	2.75*	2.49*	2.29	2.72*	2.658
MD	10/31	10/12	10/31	11/01	10/31	10/22	11/01	10/28	10/31	11/01	11/01	10/31
PHT	77.2	71.4	90.5	84.7	74.4	60.0	90.2	76.1	69.2	59.4	82.2	70.6
NN	24	24	29	28	23	20	28	26	22	21	26	25
FS	6/08	6/08	6/08	6/08	6/15	6/15	6/15	6/15	6/25	6/25	6/25	6/25
FB	7/04	7/04	7/05	7/05	7/11	7/11	7/11	7/11	7/20	7/20	7/20	7/20
FOB	8/20	8/20	8/20	8/20	8/30	8/30	8/30	8/30	9/13	9/13	9/11	9/11
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: rainp01.act Future weather: rainp01.cld

Table I-28. Predicted cotton responses using 2.00 inches (+2.00) more than mean rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.32	2.26	2.96	2.78	2.37	2.25	2.94*	2.73	2.49*	2.49	2.61*	2.93*
MD	10/11	9/23	10/29	10/15	10/26	10/11	10/31	10/18	10/30	10/26	10/30	10/30
PHT	42.4	39.2	48.6	43.7	44.1	37.8	49.3	41.1	43.6	36.7	52.9	40.1
NN	20	19	23	20	20	18	23	20	21	18	25	20
FS	6/02	6/04	6/04	6/04	6/14	6/14	6/14	6/14	6/27	6/27	6/27	6/27
FB	6/29	6/30	6/29	6/29	7/11	7/11	7/11	7/11	7/23	7/23	7/23	7/23
FOB	8/20	8/20	8/21	8/21	9/02	9/02	9/02	9/02	9/15	9/15	9/15	9/15
SO.	Sha.8											
VAR	Mid											
YLD	2.15	2.06	2.39*	2.23*	2.08	1.92	2.29*	2.05	3.30*	2.07	2.25*	2.21*
MD	10/21	9/23	11/01	10/15	10/31	10/19	10/30	10/24	10/31	11/01	10/30	10/31
PHT	62.8	54.4	79.8	74.8	62.0	56.1	77.0	72.3	67.1	52.5	72.6	61.3
NN	22	20	27	26	22	21	27	26	23	20	25	23
FS	6/02	6/02	6/01	6/01	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/10	7/10	7/11	7/11	7/23	7/23	7/23	7/23
FOB	8/20	8/20	8/20	8/20	8/31	8/31	8/31	8/31	9/15	9/15	9/15	9/15
SO.	Sha.8											
VAR	De119											
YLD	2.46	2.33	3.10*	2.85	2.44	2.33	3.00*	2.76	2.53*	2.51	2.61*	2.78*
MD	10/11	9/23	10/29	10/16	10/26	10/11	10/31	10/18	10/30	10/26	10/30	10/30
PHT	42.4	39.2	49.0	41.6	45.8	37.7	49.3	41.0	43.6	36.3	51.5	38.0
NN	20	19	23	20	21	18	23	20	21	18	24	19
FS	6/02	6/02	6/02	6/02	6/14	6/14	6/14	6/14	6/27	6/27	6/27	6/27
FB	6/29	6/29	6/29	6/29	7/11	7/11	7/11	7/11	7/23	7/23	7/23	7/23
FOB	8/20	8/20	8/20	8/20	9/02	9/02	9/02	9/02	9/17	9/17	9/17	9/17
SO.	Dub.7											
VAR	Mid											
YLD	2.24	2.11	2.40*	2.24*	2.17	1.94	2.25*	2.05	2.31*	2.08	2.25*	2.21*
MD	10/21	9/23	11/01	10/15	10/31	10/19	10/30	10/24	11/01	11/01	10/30	10/31
PHT	62.7	54.3	87.7	80.4	61.9	56.0	76.9	72.3	67.4	52.5	72.9	61.2
NN	22	20	30	28	22	21	27	26	23	20	25	23
FS	6/01	6/01	6/01	6/01	6/12	6/12	6/12	6/12	6/26	6/26	6/26	6/26
FB	6/29	6/29	6/29	6/29	7/10	7/10	7/10	7/10	7/23	7/23	7/23	7/23
FOB	8/20	8/20	8/20	8/20	8/31	8/31	8/31	8/31	9/15	9/15	9/15	9/15
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: rainp02.act Future weather: rainp02.cld

Table I-29. Predicted cotton responses using 3.0 inches more (+3.00) than mean rainfall for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.10	1.99	2.61*	2.35	1.90	1.78	2.31*	2.14	2.01*	1.95	2.23*	2.25*
MD	10/22	9/25	10/31	10/19	10/28	10/19	11/01	10/31	10/30	10/30	10/31	10/31
PHT	45.4	37.0	48.4	39.8	42.6	36.3	48.2	40.0	42.4	38.8	48.8	40.5
NN	20	18	22	19	20	18	22	19	19	18	21	19
FS	6/03	6/03	6/03	6/03	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/22	7/22	7/22	7/22
FOB	8/19	8/19	8/19	8/19	8/28	8/28	8/28	8/28	9/17	9/17	9/17	9/17
SO.	Sha.8											
VAR	Mid											
YLD	2.04	1.90	2.53	2.33	1.79	1.71	2.32	2.07	2.00*	1.84	2.31*	2.28*
MD	10/11	9/30	11/01	10/14	10/28	10/12	10/31	10/30	10/30	11/01	10/30	11/01
PHT	62.7	57.6	73.7	64.3	62.7	52.0	70.9	55.6	60.0	52.7	70.7	57.7
NN	21	20	24	23	20	19	23	20	20	18	24	20
FS	6/01	6/01	6/01	6/01	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/22	7/22	7/22	7/22
FOB	8/19	8/19	8/19	8/19	8/28	8/28	8/28	8/28	9/17	9/17	9/17	9/17
SO.	Sha.8											
VAR	De119											
YLD	2.11	1.99	2.64*	2.36	1.84	1.71	2.29*	2.04	2.00*	1.93	2.20*	2.19*
MD	10/22	9/25	10/31	10/10	10/26	10/12	11/01	10/27	10/30	10/30	10/31	10/31
PHT	45.3	37.0	46.8	39.8	42.6	35.0	48.2	40.0	42.3	38.7	48.7	39.0
NN	20	18	21	19	20	17	22	19	19	18	21	18
FS	6/03	6/03	6/03	6/03	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/22	7/22	7/22	7/22
FOB	8/19	8/19	8/19	8/19	8/28	8/28	8/28	8/28	9/17	9/17	9/17	9/17
SO.	Dub.7											
VAR	Mid											
YLD	2.07	1.88	2.57	2.34	1.76	1.64	2.29	1.98	1.99*	1.80	2.31*	2.23*
MD	10/23	9/29	10/31	10/14	10/28	10/11	10/31	10/28	10/30	11/01	10/30	11/01
PHT	62.7	57.5	73.7	64.3	62.7	50.2	68.6	53.7	59.9	52.7	68.4	57.7
NN	21	20	24	23	20	18	22	19	20	18	23	20
FS	6/01	6/01	6/01	6/01	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/22	7/22	7/22	7/22
FOB	8/19	8/19	8/19	8/19	8/28	8/28	8/28	8/28	9/17	9/17	9/17	9/17
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: rainp03.act Future weather: rainp03.cld

Table I-30. Predicted cotton responses using average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	1.35	1.40	1.45	1.41	1.26	1.19	1.27	20	1.62*	1.62	1.63*	1.58
MD	9/20	9/13	10/0	9/16	10/10	9/27	10/17	9/30	10/30	10/24	11/01	10/25
PHT	31.9	29.1	235.8	34.0	26.3	25.5	31.9	30.2	26.1	24.4	28.9	27.7
NN	22	20	23	21	21	19	23	21	22	19	23	21
FS	6/03	6/03	6/03	6/03	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/09	7/09	7/09	7/09	7/19	7/19	7/19	7/19
FOB	8/13	8/12	8/13	8/13	8/23	8/23	8/23	8/23	9/09	9/09	9/09	9/09
SO.	Sha.8											
VAR	Mid											
YLD	0.90	0.85	0.78	0.82	0.65	0.67	0.70	0.67	0.90	0.77	0.98*	0.85
MD	9/20	9/10	9/20	9/15	10/11	9/27	10/16	9/30	11/01	10/27	11/01	10/31
PHT	40.2	36.2	43.7	40.7	31.4	29.6	34.2	34.3	30.9	29.9	33.7	33.0
NN	22	19	21	19	19	19	20	20	20	19	21	20
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/24	6/24	6/24	6/24
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/19	7/19	7/19	7/19
FOB	8/13	8/13	8/13	8/13	8/23	8/23	8/23	8/23	9/09	9/09	9/09	9/09
SO.	Sha.8											
VAR	De119											
YLD	1.93	1.80	2.00	1.93	2.17	1.87	2.39*	2.13	2.41*	2.50	2.48*	2.61*
MD	9/26	9/15	10/17	9/26	10/26	10/07	11/01	10/15	11/01	10/27	11/01	11/01
PHT	39.8	35.8	42.5	39.6	34.9	32.3	38.1	36.1	35.3	32.1	39.0	36.2
NN	24	21	24	22	23	20	24	23	24	21	25	23
FS	6/03	6/03	6/03	6/03	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/09	7/09	7/09	7/09	7/19	7/19	7/19	7/19
FOB	8/13	8/13	8/13	8/13	8/24	8/24	8/24	8/24	9/09	9/09	9/09	9/09
SO.	Dub.7											
VAR	Mid											
YLD	1.08	1.13	1.19	1.21	1.11	1.09	1.20	1.04	1.52*	1.31	1.58*	1.60*
MD	9/24	9/12	10/09	9/17	10/15	10/01	10/28	10/05	10/31	10/28	11/01	11/01
PHT	48.8	48.1	52.5	50.4	43.6	42.2	44.5	44.8	43.6	40.0	46.3	42.2
NN	21	20	22	21	21	20	21	21	23	21	23	21
FS	6/02	6/02	6/02	6/02	6/11	6/11	6/11	6/11	6/24	6/24	6/24	6/24
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/19	7/19	7/19	7/19
FOB	8/13	8/14	8/13	8/14	8/23	8/23	8/23	8/23	9/09	9/09	9/09	9/09
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: wind00.act Future weather: wind00.nor

Table I-31. Predicted cotton responses using -10% deviation of average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.74	2.66	3.08*	2.81*	2.68	2.66	2.97*	2.76	2.37*	2.54*	2.48*	2.65*
MD	10/24	9/22	10/29	10/02	10/28	10/13	11/01	10/29	10/30	10/30	10/31	10/30
PHT	43.2	34.9	48.0	44.7	44.2	36.5	47.6	41.6	39.0	35.3	42.4	38.3
NN	23	19	27	26	24	22	25	24	23	22	25	24
FS	6/05	6/05	6/05	6/05	6/13	6/13	6/13	6/13	6/24	6/24	6/24	6/24
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/18	7/18	7/18	7/18
FOB	8/16	8/16	8/16	8/16	8/25	8/25	8/25	8/25	9/05	9/05	9/05	9/05
SO.	Sha.8											
VAR	Mid											
YLD	2.31*	1.90*	2.41*	2.06*	2.23	2.13	2.27*	2.24	1.83*	1.84	1.92*	2.01*
MD	10/13	9/22	11/01	9/26	10/30	10/03	10/30	10/13	11/01	11/01	11/01	11/01
PHT	55.2	48.8	66.5	63.2	63.8	56.4	69.9	57.3	56.5	52.1	59.1	56.5
NN	26	25	27	27	25	24	26	25	24	23	24	23
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/22	6/22	6/22	6/22
FB	6/29	6/29	6/28	6/28	7/07	7/07	7/08	7/08	7/17	7/17	7/17	7/17
FOB	8/17	8/17	8/16	8/16	8/24	8/24	8/25	8/25	9/04	9/04	9/14	9/04
SO.	Sha.8											
VAR	De119											
YLD	2.83	2.74	3.60*	3.38*	2.82	2.80	3.49*	3.36*	2.67*	2.76	2.91*	3.39*
MD	10/04	9/23	10/31	10/12	10/27	10/09	10/31	10/29	10/31	10/30	10/31	10/30
PHT	47.3	37.5	54.4	49.8	46.9	37.3	51.9	50.9	42.7	37.2	49.8	42.0
NN	22	19	27	27	22	19	26	27	24	21	27	24
FS	6/05	6/05	6/05	6/05	6/13	6/13	6/13	6/13	6/24	6/24	6/24	6/24
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/18	7/18	7/18	7/18
FOB	8/06	8/16	8/16	8/16	8/25	8/25	8/25	8/25	9/05	9/05	9/05	9/05
SO.	Dub.7											
VAR	Mid											
YLD	2.55	2.27	2.80*	2.45*	2.55	2.40*	2.78*	2.62*	2.13*	2.18	2.33*	2.40
MD	10/09	9/24	11/01	9/29	11/01	10/05	10/31	10/24	11/01	11/01	11/01	11/01
PHT	66.1	64.4	81.7	72.3	73.9	60.3	82.8	72.1	63.6	62.2	66.2	62.5
NN	23	27	30	29	25	24	29	28	25	25	25	24
FS	6/04	6/04	6/04	6/04	6/12	6/12	6/12	6/12	6/22	6/22	6/22	6/22
FB	6/28	6/28	6/29	6/29	7/07	7/07	7/08	7/08	7/18	7/18	7/17	7/17
FOB	8/16	8/16	8/17	8/17	8/24	8/24	8/25	8/25	9/05	9/05	9/04	9/04
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: windm10.act Future weather: windm10.hot

Table I-32. Predicted cotton responses using -25% deviation of average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30			38	30			38	30			38
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.03	2.21	2.44*	2.47*	2.14	2.33	2.45*	2.59*	1.93*	2.28*	1.73*	2.07*
MD	9/19	9/13	10/08	9/19	10/11	9/19	10/20	10/14	10/20	10/20	10/20	10/20
PHT	40.8	36.0	46.6	38.4	43.3	39.5	43.9	43.7	33.9	30.0	37.4	35.3
NN	24	22	26	23	26	24	26	25	24	21	25	23
FS	6/01	6/01	6/01	6/01	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/25	6/25	6/25	6/25	7/04	7/04	7/04	7/04	7/19	7/19	7/19	7/19
FOB	8/10	8/10	8/10	8/10	8/20	8/20	8/20	8/20	9/07	9/07	9/07	9/07
SO.	Sha.8											
VAR	Mid											
YLD	1.12	1.25	1.32	1.42	1.34	1.43	1.61*	1.69	1.35*	1.33*	1.34*	1.42*
MD	9/16	9/08	9/20	9/13	10/13	9/23	10/17	10/07	10/19	10/20	10/20	10/20
PHT	50.9	48.2	57.6	52.7	52.5	52.3	57.7	57.0	43.2	41.3	46.1	44.5
NN	21	20	23	21	23	22	24	24	22	22	23	22
FS	5/30	5/30	5/30	5/30	6/10	6/10	6/10	6/10	6/23	6/23	6/23	6/23
FB	6/25	6/25	6/24	6/24	7/05	7/05	7/04	7/04	7/18	7/18	7/18	7/18
FOB	8/09	8/09	8/08	8/08	8/21	8/21	8/20	8/20	9/06	9/06	9/06	9/06
SO.	Sha.8											
VAR	De119											
YLD	2.43	2.53	3.09*	3.07*	2.51	2.58	3.03*	3.27*	2.24*	2.53*	2.25*	2.83*
MD	9/23	9/12	10/19	9/21	10/19	9/24	10/20	10/18	10/20	10/20	10/20	10/20
PHT	45.0	34.9	51.1	43.3	45.7	39.9	51.4	46.5	41.2	37.6	48.3	43.4
NN	23	19	27	25	23	21	26	24	23	21	26	24
FS	6/01	6/01	6/01	6/01	6/11	6/11	6/11	6/11	6/25	6/25	6/25	6/25
FB	6/25	6/25	6/25	6/25	7/04	7/04	7/04	7/04	7/19	7/19	7/19	7/19
FOB	8/10	8/10	8/10	8/10	8/20	8/20	8/20	8/20	9/07	9/07	9/07	9/07
SO.	Dub.7											
VAR	Mid											
YLD	1.75	1.86*	2.05	2.06*	1.92*	1.92	2.28*	2.20*	1.75*	1.91*	1.79*	2.11*
MD	9/20	9/14	10/13	9/15	10/13	10/05	10/12	10/20	10/19	10/20	10/19	10/20
PHT	60.7	58.6	67.1	59.4	59.5	54.8	68.5	65.1	55.5	52.6	61.1	55.8
NN	24	24	26	24	24	23	26	26	24	23	25	24
FS	5/30	5/30	5/30	5/30	6/10	6/10	6/10	6/10	6/23	6/23	6/23	6/23
FB	6/25	6/25	6/24	6/24	7/05	7/05	7/04	7/04	7/18	7/18	7/18	7/18
FOB	8/10	8/10	8/08	8/08	8/21	8/21	8/20	8/20	9/06	9/06	9/06	9/06
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: windm25.act Future weather: windm25.hot

Table I-33. Predicted cotton responses using -50% deviation of average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30			38	30			38	30			38
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.68	2.40	2.70*	2.27	2.69	2.61	2.60*	2.48	2.27-1	2.36	2.01*	2.28*
MD	10/26	9/06	11/01	9/10	10/31	10/06	11/01	10/21	1/01	10/25	10/29	11/01
PHT	30.0	24.4	35.6	28.2	36.7	30.6	41.4	34.7	36.6	33.8	36.1	34.0
NN	24	20	25	23	24	22	25	23	25	22	25	22
FS	5/31	5/31	5/31	5/31	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/25	6/25	6/25	6/25	7/04	7/04	7/04	7/04	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/25	8/24	8/25	8/25	9/09	9/09	9/09	9/09
SO.	Sha.8											
VAR	Mid											
YLD	1.68	1.51	1.86	1.79	2.43	2.16	2.29*	2.24	1.78	1.82	1.69*	1.77
MD	9/22	9/11	10/14	9/19	10/29	10/23	10/29	10/26	10/29	10/29	11/01	10/28
PHT	38.6	34.3	46.6	41.9	46.8	39.8	51.6	44.8	47.3	44.2	50.6	50.1
NN	22	21	24	23	22	23	24	23	24	22	24	24
FS	5/29	5/29	5/29	5/29	6/09	6/09	6/09	6/09	6/25	6/25	6/25	6/25
FB	6/25	6/25	6/25	6/25	7/03	7/03	7/03	7/03	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/23	8/23	8/23	8/23	9/09	9/09	9/09	9/09
SO.	Sha.8											
VAR	De119											
YLD	2.95	2.95	3.51*	3.29*	2.80	2.79	3.51*	3.38*	2.54*	2.71	2.70*	3.21*
MD	10/31	9/20	10/31	10/21	10/27	10/04	11/01	10/23	10/27	10/26	11/01	11/01
PHT	39.6	33.4	43.8	39.8	43.1	36.5	48.4	41.1	41.2	37.3	45.7	42.1
NN	22	20	26	26	22	20	26	25	24	20	26	24
FS	5/31	5/31	5/31	5/31	6/11	6/11	6/11	6/11	6/26	6/26	6/26	6/26
FB	6/25	6/25	6/25	6/25	7/04	7/04	7/04	7/04	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/25	8/25	8/25	8/25	9/09	9/09	9/09	9/09
SO.	Dub.7											
VAR	Mid											
YLD	2.44	2.30	2.49	2.47	2.41	2.31	2.58*	2.50	2.01*	2.20	2.26*	2.50*
MD	10/13	9/16	10/26	9/26	10/27	10/06	10/29	10/25	10/29	10/29	11/01	10/29
PHT	56.3	46.8	60.1	54.5	57.5	50.9	64.6	60.1	55.9	52.2	62.3	56.7
NN	26	24	26	26	25	23	26	27	24	23	26	25
FS	5/29	5/29	5/29	5/29	6/09	6/09	6/09	6/09	6/25	6/25	6/25	6/25
FB	6/25	6/26	6/25	6/25	7/03	7/03	7/03	7/03	7/20	7/20	7/20	7/20
FOB	8/12	8/13	8/12	812	8/23	8/23	8/23	8/23	9/09	9/09	9/09	9/09
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: windm50.act Future weather: windm50.cld

Table I-34. Predicted cotton responses using +10% deviation of average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30			38	30			38	30			38
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.16	2.21	2.19*	2.23	2.02	2.03	2.01*	2.08	1.59*	1.71	1.61*	1.73*
MD	10/26	10/03	11/01	10/23	10/26	10/14	11/01	10/27	10/30	10/27	10/30	11/01
PHT	42.5	35.6	45.8	39.1	43.0	36.4	43.7	38.7	37.8	36.7	39.4	37.7
NN	23	21	24	22	23	20	23	21	21	20	22	20
FS	6/03	6/03	6/03	6/03	6/13	6/13	6/13	6/13	6/28	6/28	6/28	6/28
FB	6/29	6/29	6/29	6/29	7/08	7/08	7/08	7/08	7/24	7/24	7/24	7/24
FOB	8/19	8/19	8/19	8/19	8/28	8/28	8/28	8/28	9/17	8/28	9/17	9/17
SO.	Sha.8											
VAR	Mid											
YLD	1.78	1.77	1.75	1.80	1.53	1.53	1.54	1.59	1.12*	1.19	1.17*	1.25*
MD	10/12	9/22	10/27	10/06	10/29	10/13	11/01	10/24	11/01	11/01	11/01	11/01
PHT	54.6	50.8	61.8	55.5	57.5	52.1	60.2	55.5	53.1	50.6	54.3	52.9
NN	21	21	23	22	22	20	23	21	21	20	22	20
FS	6/01	6/01	6/01	6/01	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	6/30	6/30	6/29	6/30	7/08	7/08	7/08	7/08	7/24	7/24	7/24	7/24
FOB	8/20	8/20	8/19	8/19	8/28	8/28	8/28	8/28	9/17	9/17	9/14	9/14
SO.	Sha.8											
VAR	De119											
YLD	2.70*	2.65	3.14*	2.85	2.67	2.61	2.75*	2.64	2.41*	2.64	2.27*	2.58*
MD	10/31	9/20	11/01	10/29	10/31	10/16	11/01	10/30	10/30	10/31	10/30	11/01
PHT	44.7	37.1	50.6	41.9	46.2	39.2	48.3	41.8	43.8	40.7	45.7	40.7
NN	22	20	26	25	24	21	25	22	23	21	23	21
FS	6/03	6/03	6/03	6/03	6/13	6/13	6/13	6/13	6/28	6/27	6/28	6/28
FB	6/29	6/29	6/29	6/29	7/08	7/08	7/08	7/08	7/24	7/24	7/24	7/24
FOB	8/19	8/19	8/19	8/19	8/28	8/28	8/28	8/28	9/17	9/17	9/17	9/17
SO.	Dub.7											
VAR	Mid											
YLD	2.29	2.15	2.33*	2.23	2.09*	1.98	2.21*	2.12	1.98*	1.99*	2.02*	2.11*
MD	10/27	9/29	10/31	10/28	11/01	10/24	11/01	10/26	11/01	11/01	11/01	11/01
PHT	61.0	53.3	66.2	59.5	61.3	56.7	65.9	59.7	61.2	56.4	65.9	59.3
NN	25	24	25	25	23	22	24	23	23	21	24	22
FS	6/01	6/01	6/01	6/01	6/12	6/12	6/12	6/12	6/27	6/27	6/27	6/27
FB	6/30	6/30	6/29	6/29	7/08	7/08	7/08	7/08	7/24	7/24	7/24	7/24
FOB	8/21	8/21	8/19	8/19	8/28	8/28	8/28	8/28	9/15	9/15	9/15	9/15
SO.	Dub.7											
AR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: windp10.act Future weather: windp10.cld

Table I-35. Predicted cotton responses using +25% deviation of average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	2.72	2.61	3.31	2.99*	2.76*	2.74	3.21*	3.19	2.52*	2.80*	2.22*	2.41*
MD	10/30	9/23	10/31	10/05	11/01	10/17	10/31	10/27	11/01	10/31	11/01	10/30
PHT	36.5	30.6	43.7	39.9	37.1	30.4	46.3	37.6	36.5	29.3	41.4	33.6
NN	22	19	24	25	22	19	27	24	25	22	26	23
FS	6/04	6/04	6/04	6/04	6/14	6/14	6/14	6/14	6/27	6/27	6/27	6/27
FB	6/30	6/30	6/30	6/30	7/09	7/09	7/09	7/09	7/21	7/21	7/21	7/21
FOB	8/20	8/20	8/20	8/20	8/31	8/31	8/31	8/31	9/16	9/16	9/16	9/16
SO.	Sha.8											
VAR	Mid											
YLD	1.72	1.65	2.05	1.78	1.95	1.89	2.27	2.24	2.10*	2.03	2.17*	2/10*
MD	10/12	9/20	10/28	9/29	10/30	10/22	11/01	10/27	10/30	11/01	10/30	10/31
PHT	46.3	41.4	51.2	50.3	48.1	43.1	56.4	48.4	39.6	33.8	47.9	36.7
NN	22	20	23	24	22	22	24	23	21	19	23	20
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/25	6/25	6/25	6/25
FB	6/30	7/01	6/29	6/30	7/09	7/09	7/08	7/08	7/20	7/20	7/20	7/20
FOB	8/19	8/20	8/19	8/20	8/30	8/30	8/30	8/29	9/13	9/13	9/13	9/13
SO.	Sha.8											
VAR	De119											
YLD	2.82	2.75	3.62*	3.41	2.72*	2.79	3.50*	3.57	2.67*	2.91	2.62*	3/19*
MD	10/31	10/03	10/31	10/24	11/01	10/18	11/01	10/26	11/01	10/31	10/31	10/31
PHT	42.9	36.1	49.5	46.7	42.4	36.7	49.6	43.6	43.4	36.1	48.7	41.6
NN	21	19	24	25	21	19	25	23	24	21	26	24
FS	6/04	6/04	6/04	6/04	6/14	6/14	6/14	6/14	6/27	6/27	6/27	6/27
FB	6/30	6/30	6/30	6/30	7/09	7/09	7/09	7/09	7/21	7/21	7/21	7/21
FOB	8/20	8/20	8/20	8/20	8/31	8/31	8/31	8/31	9/16	9/16	9/16	9/16
SO.	Dub.7											
VAR	Mid											
YLD	2.46	2.29	2.90*	2.72*	2.46	2.38	2.80*	2.64*	2.33*	2.36	2.39*	2.63*
MD	10/27	9/30	11/01	10/27	11/01	10/25	11/01	11/01	10/30	11/01	10/30	11/01
PHT	62.8	54.6	72.6	77.1	59.1	52.8	69.3	67.4	54.5	46.4	62.0	51.8
NN	23	21	27	29	22	21	26	27	23	21	25	22
FS	6/02	6/02	6/02	6/02	6/12	6/12	6/12	6/12	6/25	6/25	6/25	6/25
FB	6/30	7/01	6/29	6/30	7/09	7/09	7/08	7/08	7/20	7/20	7/20	7/20
FOB	8/20	8/21	8/20	8/20	8/31	8/31	8/20	8/20	9/14	9/14	9/14	9/14
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: windp25.act Future weather: windp25.cld

Table I-36. Predicted cotton responses using -10% deviation of average wind run for three emergence dates, two row spacings, and two plant populations.

	EMERGENCE DATE											
	5/01		5/01		5/15		5/15		6/01		6/01	
	Row Spacing (inches)				Row Spacing (inches)				Row Spacing (inches)			
	30		38		30		38		30		38	
PPF	2	4	2	4	2	4	2	4	2	4	2	4
YLD	0.56	0.62	0.74	0.74	0.96	1.00	0.97	0.98	1.21	1.19	1.21*	1.19
MD	9/11	9/02	9/21	9/05	10/17	10/08	10/22	10/11	11/01	10/23	11/01	10/25
PHT	11.9	11.4	16.4	13.4	17.3	15.7	20.1	18.1	22.7	20.7	23.7	22.6
NN	16	15	20	16	20	18	20	18	21	19	21	19
FS	6/04	6/04	6/04	6/04	6/15	6/15	6/15	6/15	6/27	6/27	6/27	6/27
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/21	7/21	7/21	7/21
FOB	8/13	8/13	8/13	8/13	8/25	8/25	8/25	8/25	9/20	9/20	9/21	9/21
SO.	Sha.8											
VAR	Mid											
YLD	0.30	0.25	0.33	0.28	0.51	0.49	0.63	0.62	0.76	0.79	0.87*	0.73
MD	9/21	8/30	9/23	9/08	10/17	10/14	10/22	10/15	10/31	10/28	10/31	10/31
PHT	16.5	14.5	20.1	17.1	21.5	21.7	26.4	27.2	28.7	28.1	33.6	31.8
NN	18	16	20	17	19	18	20	20	20	20	22	20
FS	6/02	6/02	6/02	6/02	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/07	7/07	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/12	8/12	8/12	8/12	8/24	8/25	8/25	8/25	9/17	9/17	9/17	9/17
SO.	Sha.8											
VAR	De119											
YLD	1.25	1.24	1.39	1.29	1.73	1.54	1.78	1.60	2.11*	1.98	2.12*	1.96
MD	10/16	9/22	10/23	9/29	10/28	10/15	11/01	10/19	11/01	10/30	11/01	10/30
PHT	23.1	21.8	27.6	25.9	28.0	26.1	30.8	28.9	32.0	28.1	35.4	30.8
NN	21	19	22	20	21	19	22	20	23	20	24	21
FS	6/04	6/04	6/04	6/04	6/15	6/15	6/15	6/15	6/27	6/27	6/27	6/27
FB	6/28	6/28	6/28	6/28	7/08	7/08	7/08	7/08	7/21	7/21	7/21	7/21
FOB	8/14	8/13	8/14	8/13	8/26	8/26	8/26	8/26	9/22	9/22	9/22	9/22
SO.	Dub.7											
VAR	Mid											
YLD	1.05	0.80	0.88	0.81	1.17	0.96	1.10	0.96	1.49*	1.31	1.60*	1.35
MD	10/15	9/22	10/18	9/28	10/25	10/16	10/31	10/18	11/01	11/01	11/01	11/01
PHT	32.0	26.5	36.4	30.5	37.1	32.0	42.1	38.0	44.5	42.3	48.7	45.6
NN	21	19	21	20	21	19	22	20	23	21	24	22
FS	6/02	6/02	6/02	6/02	6/13	6/13	6/13	6/13	6/25	6/25	6/25	6/25
FB	6/27	6/27	6/27	6/27	7/07	7/07	7/07	7/07	7/20	7/20	7/20	7/20
FOB	8/12	8/12	9/12	8/12	8/25	8/25	8/25	8/25	9/18	9/18	9/18	9/18
SO.	Dub.7											
VAR	De119											

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Mid-midseason variety De119-DES 119 Sha.8-Sharkey 8 Dub.7-Dubbs 7
Actual weather: windp50.act Future weather: windp50.cld

EMERGENCE DATE						
	Row Spacing (inches)		Row Spacing (inches)		Row Spacing (inches)	
PPF YLD MD PHT NN FS FB FOB SO. VAR						
YLD MD PHT NN FS FB FOB SO. VAR						
YLD MD PHT NN FS FB FOB SO. VAR						
YLD MD PHT NN FS FB FOB SO. VAR						

CROP-Cotton ED-Emergence Date (month/day) RS-Row spacing (inches) PPF-Plants per foot of row YLD-Yield (bales/acre)
MD-Maturity date PHT-Plant height (inches) NN-Number of nodes FOB-First open boll FS-First square
FB-First bloom SO.-Soil VAR-Variety * Several green bolls at final yield
Actual weather: ********.act Future weather: ********.nor

Appendix II

This appendix describes how the new weather files were assembled and their deviations calculated. Table II-1 shows the 1965 weather for one week starting April 1, listed in the GOSSYM/COMAX format. This is similar to Appendix I, Table 1 (I-1) and with the same units. The two bottom lines show the average daily values for maximum temperature, minimum temperature, solar radiation, and wind run or the total weekly value for rainfall. In equation form:

for temperature, solar radiation, wind run **(1a)**

$$y_{jk} = \sum_{i=1}^{7} x_{ijk}/7$$

for rainfall **(1b)**

$$y_{jk} = \sum_{i=1}^{7} x_{ijk}$$

where x is the weather variable, y is the average or sum of the weather variable; i = 1, 2, . . . 7 (day); j = 1, 2, . . . 39 (week); k = 1965, 1966, . . . 1992 (year).

Table II-2 shows the 28-year average value for each of the weather variables for the week starting April 1 as explained in the bottom two lines of Table II-1.

(2)

$$y_j = \sum_{k=1965}^{1992} y_{jk}/28$$

Table II-3 shows the deviations of each average value of each weather variable for the week starting April 1, 1965 (Table II-1). These are the average values from Table II-1 divided by those in Table II-2 and converted to percentages.

For temperature, solar radiation, wind run **(3a)**

$$D_j = \left(\frac{y_{jk} - y_j}{y_j}\right) 100$$

For rainfall **(3b)**

$$D_j = y_{jk} - y_j$$

The deviations of maximum temperature for the week starting April 1 for the 27 years are given in Table II-4. The value for 1965 is in Table II-3. From Table II-4, the week closest to 0 deviation, 1970, was chosen as the first week's data to go into the normal maximum temperature file, TMAX00.ACT, for all tests, except the critical growth stage tests.

(4a)

$$D_{jmin} = \min|D_j|$$

For non-zero deviations a more general equation is:

(4b)

$$D_{jmin} = \min|D_j + n|$$

where

for temperatures n = -10%, -5%, -1%, +1%, +5%, +10%

for solar radiation and wind run

n= -50%, -25%, -10%, +10%, +25%, +50%

for rainfall n = -1, -0.5, -0.25, +1, +2, +3 inches

The first week in the TMAX00.ACT file, starting April 1, is shown in Table II-5. The last two lines show the deviations of each of the averages for the week in the two previous lines. These procedures were repeated for each week of the season, until December 31, for each weather variable for each desired deviation of each weather variable (scenario) in order to build all 35 weather files.

Table II-1. Weather records from the first week in 1965.

	DOY	M/D	Solar	Tmax	Tmin	Rain	Wind
	92	'04/01'	426	74	51	0.00	121.20
	93	'04/02'	341	79	58	0.13	116.71
	94	'04/03'	524	68	56	0.17	169.08
	95	'04/04'	383	78	59	0.00	142.15
	96	'04/05'	256	82	65	0.00	181.05
	97	'04/06'	358	78	63	1.48	134.67
	98	'04/07'	511	70	63	0.94	125.69
Weekly average			**399.3**	**75.6**	**59.3**		**141.50**
Weekly total						**2.72**	

Table II-2. Weekly mean of weather records for 28 years.

	Solar	Tmax	Tmin	Rain	Wind
Weekly average	445.6	70.7	49.5		145.60
Weekly total				1.15	

Table II-3. Average weekly deviation (AWD) from the mean of each weather variable in 1965.

	Solar	Tmax	Tmin	Rain	Wind
Percent	-10.4	6.8	20.0		-2.8
Inches				1.57	

Table II-4. AWD (%) of maximum temperature for each year.

DOY	AWD	DOY	AWD	DOY	AWD
1966	1.3	1975	-9.3	1984	-8.3
1967	16.7	1976	-3.8	1985	1.0
1968	-5.3	1977	2.2	1986	18.4
1969	8.2	1978	18.7	1987	-15.8
1970	-0.4	1979	-6.2	1988	6.6
1971	-10.0	1980	0.57	1989	-1.1
1972	1.4	1981	4.6	1990	-7.9
1973	-8.9	1982	-2.3	1991	9.5
1974	-2.1	1983	-11.8	1992	-9.9

Table II-5. The first week for average maximum temperature (Tmax00.nor, 1970).

	DOY	M/D	Solar	Tmax	Tmin	Rain	Wind
	92	'04/01'	604	56	42	1.84	269.33
	93	'04/02'	596	66	40	0.00	128.68
	94	'04/03'	553	71	45	0.00	94.56
	95	'04/04'	528	64	46	0.00	134.67
	96	'04/05'	604	79	45	0.00	127.13
	97	'04/06'	613	76	47	0.00	142.15
	98	'04/07'	502	81	51	0.00	109.23
Average			**571.4**	**70.4**	**45.1**		**143.70**
Total						**1.15**	
AWD (%)			**28.2**	**-0.4**	**-8.7**		**-1.4**
AWD (inches)						**0.69**	

DOY – Day of the year
M/D – Calendar Month and Day
Solar – Daily total solar radiation (Langleys/day)
Tmax – Daily maximum air temperature (° F)
Tmin – Daily minimum air temperature (° F)
Rain – Daily total rainfall (inches/day)
Wind – Daily total windrun (miles/day)
AWD – Average weekly deviation from the mean of each weather variable

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