

# **Sorghum Date-of-Planting Evaluation for the Texas Coastal Bend**

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## **Abstract**

Up to eleven planting dates were initiated at Corpus Christi, TX, from 2002 to 2004, using one-week planting intervals to study the effect of planting date on grain yields and plant structures. In 2002 less than one inch of total rainfall was received after that first planting in January. Grain sorghum yields peaked with a February 21<sup>th</sup> planting date and declined at a rate of 68 lbs/day-of-delay in planting after that date. Linear declines occurred in seed size, seed test weight, plant height and head exertion. The highest yield was 3999 lb/A. In 2003 sorghum growing conditions started the same as 2002 losing 59 lbs/day-of-delay in planting; however, 3.5 inches of rainfall were received from 5-10 June, and the best of planting dates which were booting or blooming when the rainfall was received, gained 89 lbs/day-of-delay in planting after March 3d. As much as 738 lbs/A of grain was achieved per inch of rainfall received for this April 4<sup>th</sup> planting date. This is not a recommendation for late planting, but clearly proves the importance of rainfall or irrigation when sorghum enters it's great consumptive use of water during early bloom. In 2004, the growing season was marked with an over-abundance of rainfall, creating yields as high as 5022 lbs/A for the February 22d planting date. Under these conditions, sorghum yields declined at a rate of 68 lbs/A per day-of-delay after February 22d. Yields were not limited by lack of water, but by higher night time temperatures and their affect on plant respiration rates. For this region of Texas, one week on either side of February 20<sup>th</sup> will provide maximum yields under diverse rainfall conditions. Sorghum is also so flexible, that an abundance of rainfall received at bloom <when the crop really needs adequate water>, can dramatically increase sorghum yields.

## **Introduction**

There is little information available that tells how late a grower can plant grain sorghum following lost planting dates or crop failures. Sorghum is known to be a drought tolerant crop that can recover some of its yield potential, providing plant population and plant structure are not damaged. The amount of water necessary to sustain the sorghum plant has also been estimated and is reported in figure 1. Fifty to 80 days after planting is sorghum's greatest use of soil water and rainfall. The earliest planted sorghum is often subject to bird damage or cold damage and the latest planted sorghum may experience heavy midge pressure or drought damage. Previous experience has suggested planting some time in the last two weeks of February, but little has been reported as to how much yield is lost per day-of-delay in planting or how sorghum plant structure is changed. It was also a goal to quantify the yield increases obtained with adequate rainfall or irrigation being applied at boot or bloom stage.

## **Materials and Methods**

Asgrow 571 was planted in one-week intervals beginning as soon as spring planting conditions allowed. Plots consisted of four 38-inch rows 50 feet in length, and insect and bird control was provided throughout the course of the experiments. Plots were arranged in a randomized complete block design and sufficient planting moisture was present for every planting made within the three-year course of study. The soil was an Orelia silty clay loam with a pH of 8.2. All seed was Gaucho or Cruiser treated, and was planted to a population of 55k plants/A. Head exertion was measured. Seed was cleaned and 100 gram samples were counted using a Seedboro Seed Counter. Emergence dates, plant height, blooming dates and maturity dates were recorded. Weather and field climate information was recorded through the TAES weather station network.

### **Result and Discussion**

In 2002, field conditions allowed for planting on January 31<sup>st</sup>. Soil temperatures remained in the 50's and 60's until 2/19 with 70° temperatures were found at a 1-inch planting depth. Of the nine planting dates evaluated at weekly intervals, the February 21<sup>st</sup> planting date produced the highest sorghum yields. Less than one inch of rainfall was received during this production season, and for every day-of-delay in planting after February 21<sup>st</sup>, sixty-eight lbs/A of grain was forfeited to the deficiency of soil moisture when the sorghum was blooming (see figure 2). With each passing week, subsequent planting dates had shorter and shorter peduncles. For the last two planting dates the bottom of the sorghum head did not fully emerge from the flag leaf boot. Sorghum seed also decreased in size and test weight with the lateness of planting date in 2002. In 2003, eleven planting dates

In 2003, nine planting dates were made starting 2/20 and ending 4/16. For the March 11th planting date it took 23,690 sorghum seed to make a pound of sorghum. Likewise, it required 14,464 seed from the April 10<sup>th</sup> planting date to make a pound of grain.