Characteristics of Early Planting at Yuma

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How can I best utilize my land and time for maximum return? This is an important question in Arizona agriculture.

Agronomic data from a date of planting experiment on the Yuma Valley Experiment Farm in 1961 provide some helpful information on grain sorghum production from early plantings. Two grain type sorghum hybrids and two dual purpose type sorghum hybrids were tested. A dual purpose sorghum is one which is responsive to short days (long nights) when planted early and performs like a grain sorghum. If planted later in the spring (after March 15 to 25) it begins to perform like a forage sorghum. The data from the two commercial hybrids of each type were averaged to provide a comparison between the two types.

These data are from only one year (1961). However, an investigation of the weather data from 1961, as compared to the long term average of 1931 - 1960, shows little variation of 1961 from the 30 year average. The average daily temperature from January 19 through April 17, 1961 was 63.5° F. The long time average from this same period was 63.7° F. Therefore the average temperature for the most critical early part of the season was normal in 1961. For this reason the 1961 data might be considered representative.

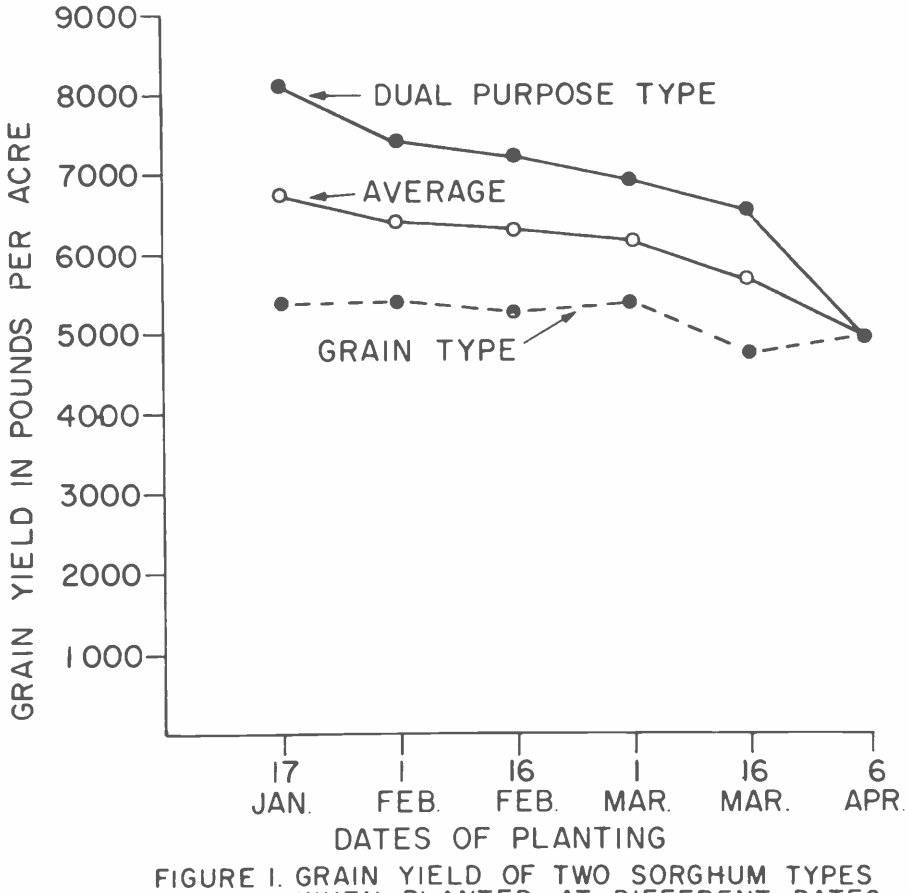

FIGURE 1. GRAIN YIELD OF TWO SORGHUM TYPES WHEN PLANTED AT DIFFERENT DATES. YUMA, AZ. 1961.

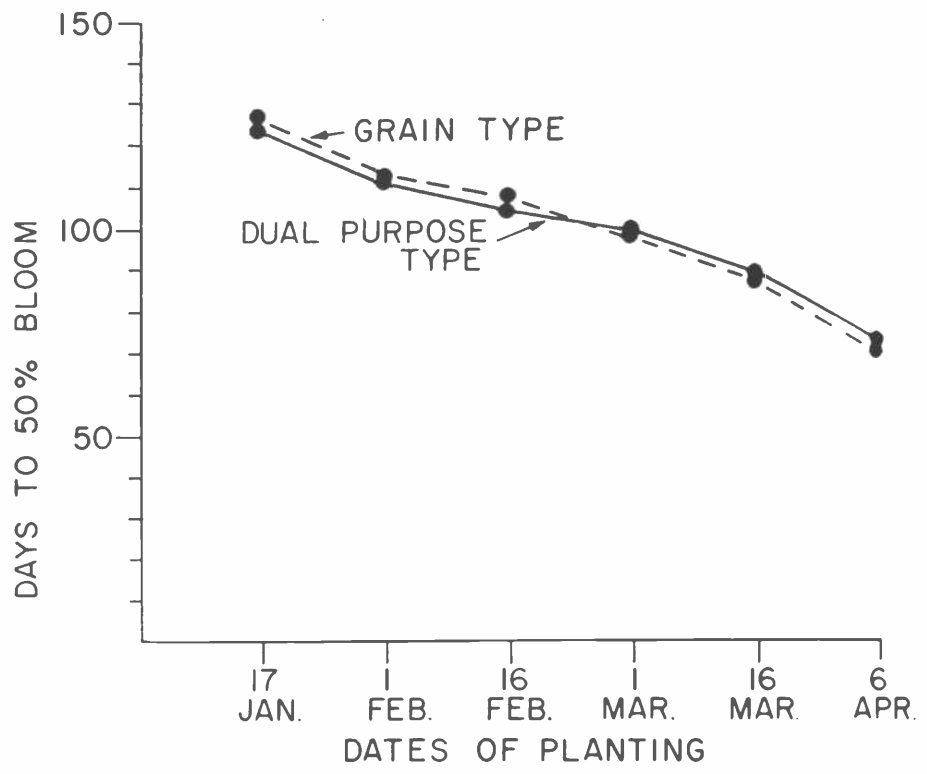

FIGURE 2. DAYS TO BLOOM OF TWO SORGHUM TYPES PLANTED AT DIFFERENT DATES YUMA, AZ. 1961.

Since the yield of grain is the most important aspect of sorghum production, it has been considered first. Figure 1 shows the total annual grain production of the two

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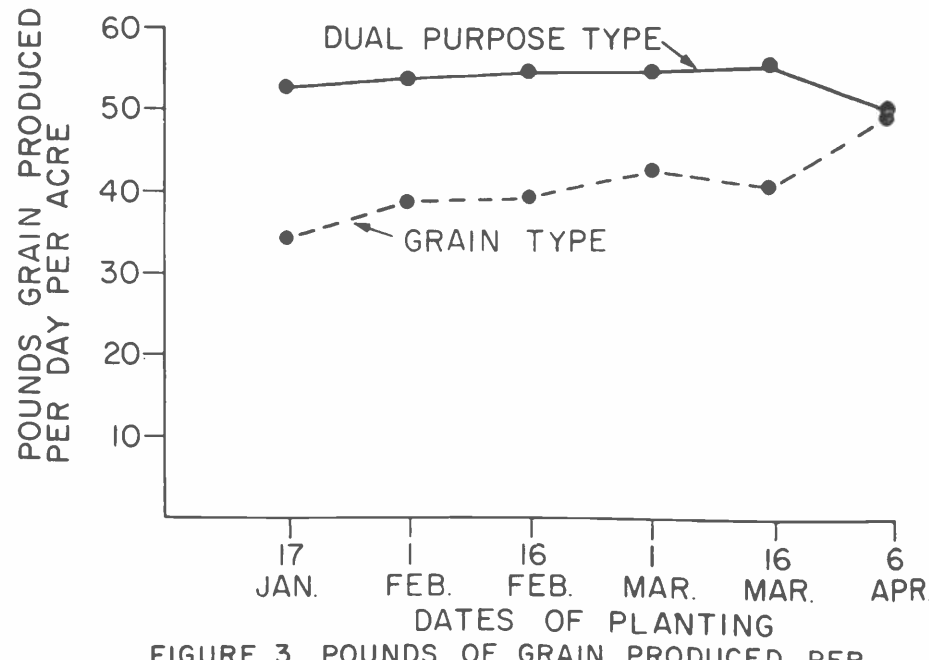

FIGURE 3. POUNDS OF GRAIN PRODUCED PER DAY PER ACRE WHEN PLANTED AT DIFFERENT DATES. YUMA, AZ. 1961

types of sorghum for each date of planting. Note that the highest yields were from the earliest plantings. This is consistent with results obtained under other environments in Arizona. Dual purpose types of sorghum outyielded grain types in grain production for the planting dates up to the middle of March. By the first of April the grain types equalled the dual purpose types in yield.

The average number of days to 50 percent bloom for both types of sorghums on all dates of planting are given in Figure 2. Note the number of days to bloom decreased successively for later dates of planting. All entries tested of each type were very similar in number of days to bloom at each date of planting. The accelerated physiological activity of the later planted sorghum plants, due to the higher temperatures encountered, resulted in earlier bloom dates.

Full maturity is generally reached by about 30 days after bloom. No further yield increases would be expected beyond 20 to 30 days after bloom, since all of the dry matter in the grain has been produced by this time and only moisture-loss, or drying remains to be accomplished.

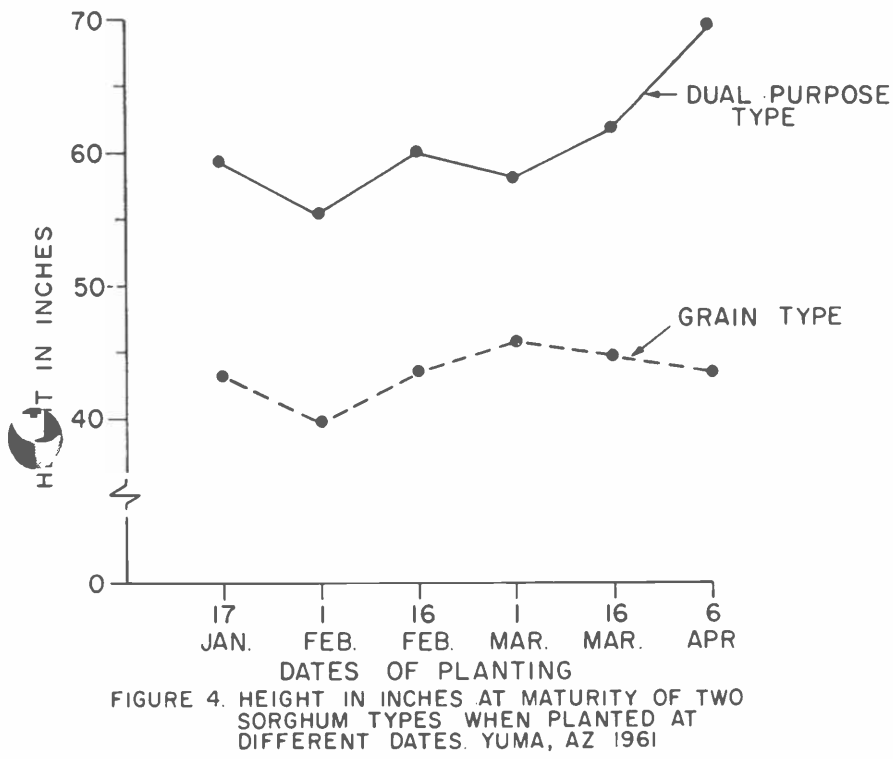

FIGURE 4. HEIGHT IN INCHES AT MATURITY OF TWO SORGHUM TYPES WHEN PLANTED AT DIFFERENT DATES. YUMA, AZ 1961

The average daily rate of grain production in pounds per acre (P) for each date of planting was calculated by dividing the average grain yield in pounds per acre (Y) by the average number of days to 50% bloom (D) plus 30: $P = Y \div (D + 30)$ The results are shown graphically in Figure 3. These data show a relatively high daily rate of production for early plantings of the dual purpose type and a lower but increasing rate of production for early plantings of the grain type. Plantings of the two types made in April were equal in production.

It would appear from Figures 1 and 3 that the greatest total seasonal grain production would be obtained by planting a dual purpose type of sorghum as early as possible.

Average height measurements of the two types of sorghums for all planting dates are shown in Figure 4. Note the rapid increase in height of the dual purpose type after the middle of March. This is indicative of the onset of forage response of this sorghum type. An April planting of the dual purpose type is likely to be beyond

Table 1. Days between different dates of Plantings and between their respective dates of bloom of two sorghum types. Yuma, Az., 1961

Dates of Planting	*Days Between Plantings*	*Ave. Date of 50% Bloom*	*Ave. Days Between Bloom*
17 Jan.		21 May	
	15		1
1 Feb.		22 May	
	15		7
16 Feb.		1 June	
	13		5
1 Mar.		6 June	
	15		5
16 Mar.		11 June	
	21		8
6 Apr.		19 June	

efficient harvest height for most combines, thus the grain type becomes more desirable for growth habit.

As previously stated, and shown in Figure 2, the number of days to bloom decreased for each later date of planting. In Table 1 the number of days between the successively later planting dates is compared with the number of days between the corresponding bloom dates. Note that the first two dates of planting bloomed within a day of each other. The first date of planting tied up the land for two weeks longer with little yield to show for it and very little gain in plant growth as indicated by bloom date. However, after the first of February later plantings did result in relatively later bloom dates.

Early planting dates resulted in much slower emergence as shown in Figure 5. The rather erratic data for the first 2 or 3 earlier dates of planting may be attributed to the fluctuation of soil temperatures in the late winter during this particular year, which influenced certain plantings more than others. The soil temperatures at 3 inch depths are also plotted on Figure 5. Note the close inverse relationship of increasing soil temperature with decreasing days to emergence. The earliest plantings required from 20 to 25 days for emergence. This great time interval exposed the young germinating seed and seedlings to much greater risk of seedling disease and loss from other factors

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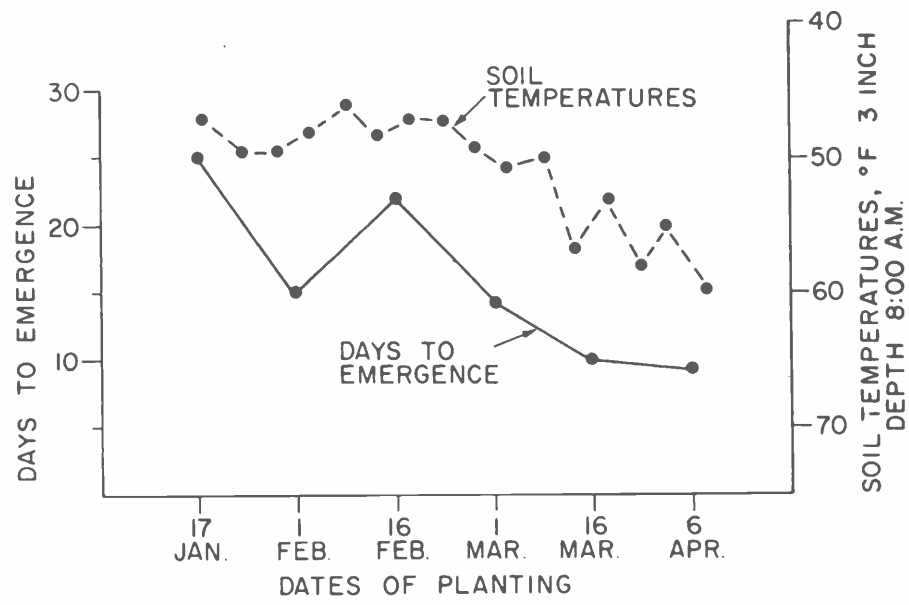

FIGURE 5 DAYS TO EMERGENCE OF TWO SORGHUM TYPES AT DIFFERENT PLANTING DATES WITH THE CORRESPONDING SOIL TEMPERATURES. YUMA, AZ. 1961.