

## GRAIN SORGHUM PRODUCTION AND OUTLOOK IN THE HUMID U.S.

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Grain sorghum production has been up and down in the southern United States for a number of years. This is illustrated by Mississippi acreage from 1970 through 85 (Table 1). Recently acreage has mushroomed. In 1980 there was less than one-half (1/2) million acres in the southeastern states of Alabama, Arkansas, Georgia, Louisiana, Mississippi, South Carolina and Tennessee. By 1985 there was approximately 2.8 million acres (Table 2). Acreage-wise Arkansas led in total acreage with almost one (1) million acres. The smallest acreage was in South Carolina.

The largest percentage increase in acreage from 1980 to 1985 was in Louisiana, followed by Mississippi with the smallest percent increase in Georgia. The increases through the south are presented in Table 3.

There have been several proposed reasons for this increase. One is the need for a crop to rotate with soybeans. Soybean acreage in the south has mushroomed. Mississippi acreage peaked at 4.2 million acres but has decreased to about 2.6 million acres in 1985. Many of the other southern states have followed the same pattern as Mississippi; large rapid increases in soybean acreage. Why do we need a crop to rotate with soybeans? One reason is soybean cyst nematode. By 1984 virtually the entire state of Mississippi had some level of infestation of this pest. Races 3 and 4 were present in many counties. Other southern states have similar situations. Actually the infested area is much greater than the southern region. It has expanded into the lower midwest, particularly up the Mississippi River. When we rotate soybeans with a non-host crop populations are drastically reduced. Grain sorghum is a non-host crop.

Even when nematodes are not a problem the yield of soybeans is improved when grain sorghum is in crop rotation. Arkansas data reflects a seven (7) to eight (8) bushel increase in soybean yields in a rotation. Similar responses come from other rotations. Grain sorghum yields are also increased in the soybean-sorghum rotation.

Another reason given for increase in grain sorghum acreage is declining yields of soybeans. However, when we look at Mississippi data

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Table 1. Acres of Grain Sorghum Harvested in Mississippi\* (Thousand Acres).

| Year | Acres Harvested | Year | Acres Harvested |
|------|-----------------|------|-----------------|
| 1970 | 116             | 1978 | 21              |
| 1971 | 150             | 1979 | 33              |
| 1972 | 33              | 1980 | 38              |
| 1973 | 30              | 1981 | 88              |
| 1974 | 38              | 1982 | 110             |
| 1975 | 38              | 1983 | 225             |
| 1976 | 41              | 1984 | 407             |
| 1977 | 24              | 1985 | 620             |

\*Miss. Crop and Livestock Reporting Service

Table 2. Acres of Grain Sorghum Harvested In Seven (7) Southeastern States - 1980-1985.\*

| State          | Year (Thousand Acres) |      |      |       |       |       |
|----------------|-----------------------|------|------|-------|-------|-------|
|                | 1980                  | 1981 | 1982 | 1983  | 1984  | 1985  |
| Alabama        | 34                    | 58   | 68   | 100   | 180   | 230   |
| Arkansas       | 203                   | 298  | 263  | 320   | 590   | 920   |
| Georgia        | 82                    | 135  | 135  | 68    | 113   | 138   |
| Louisiana      | 14                    | 72   | 145  | 180   | 269   | 410   |
| Mississippi    | 38                    | 88   | 110  | 225   | 370   | 620   |
| South Carolina | 15                    | 18   | 35   | 25    | 34    | 47    |
| Tennessee      | 35                    | 75   | 85   | 95    | 260   | 465   |
| Total          | 352                   | 744  | 841  | 1,013 | 1,816 | 2,830 |

\*Miss. Crop and Livestock Reporting Service

Table 3. Increase in Grain Sorghum Acreages by States, 1980-1985.

| State          | Percentage (%) |
|----------------|----------------|
| Alabama        | 676            |
| Arkansas       | 453            |
| Georgia        | 168            |
| Louisiana      | 2,928          |
| Mississippi    | 1,632          |
| South Carolina | 313            |
| Tennessee      | 1,329          |

this may not be a valid reason. Average yields are presented in Table 4. Since 1979 Mississippi soybean yields have fluctuated much more than in prior years. Much of this can be attributed to weather. Bean yields have really declined very little. The 1985 Mississippi average was 27 bushels per acre, just two bushels per acre under the record average of 29 bushels per acre in 1979. A more likely reason for the shift to grain sorghum is the declining profitability of soybeans. Cost of production has gone up while prices have slowly declined so that the profit potential in 1982 was \$10 to \$38 per acre compared to \$63 to \$102 per acre in 1981, Table 5.

Markets have improved throughout the area. Livestock and poultry producers have "discovered" grain sorghum. The use of local grain sorghum by swine producers and poultry producers has greatly improved the marketing in our area. Local grain elevators have also increased their handling of grain sorghum. Farmers have been able to increase acres cropped by adding grain sorghum to the soybean-cotton farm. Acreage can be increased 25 to 30% without any additional cost for labor and equipment because planting and harvesting does not compete with soybeans. This reduces overhead cost and improves cash flow.

We face some serious problems in grain sorghum production. One is disease. Grain sorghum varieties for the south have traditionally been those from western breeding programs that have performed rather well in testing programs in the South. Few varieties have been developed for the south. Three primary diseases are anthracnose, charcoal rot and a Fusarium complex that cause lower stalk rot, upper stalk rots and grain molds.

Rainfall is also a limiting factor and without irrigation consistent optimum yields are not possible. Only the coastal area averages enough summer rainfall to optimize yields without irrigation. Other areas will need irrigation 3 years out of 5 for optimum yields.

The potential for grain sorghum in the south is great. With well adapted varieties and some supplemental irrigation the present two-plus million acres could well be six to seven million acres.

Table 4. Average Soybean Yields For Mississippi - 1970-1985.\*

| Year | Yield (Bu/A) | Year | Yield (Bu/A) |
|------|--------------|------|--------------|
| 1970 | 22.5         | 1978 | 21.5         |
| 1971 | 21.5         | 1979 | 29.9         |
| 1972 | 19.5         | 1980 | 16.0         |
| 1973 | 22.0         | 1981 | 21.0         |
| 1974 | 19.5         | 1982 | 26.0         |
| 1975 | 22.5         | 1983 | 19.0         |
| 1976 | 22.0         | 1984 | 24.0         |
| 1977 | 21.5         | 1985 | 27.0         |

\*Miss. Crop and Livestock Reporting Service

Table 5. Mississippi soybeans returns to land and managment, 1975-84, based on a 25 Bu/A yield.\*

| Year | Locations    |              |
|------|--------------|--------------|
|      | Hill Area    | Delta Area   |
| 1975 | 59.22        | 76.76        |
| 1976 | 20.91        | 44.76        |
| 1977 | 51.05        | 51.05        |
| 1978 | 23.71        | 53.92        |
| 1979 | 25.16        | 60.95        |
| 1980 | 34.21        | 80.76        |
| 1981 | 63.44        | 101.95       |
| 1982 | <u>10.16</u> | <u>38.26</u> |
| 1983 | <u>4.77</u>  | <u>33.71</u> |
| 1984 | 29.82        | 72.70        |

\*Miss. Extension Ag. Economics Budget Estimates