Sweet sorghum

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Sweet Sorghum

- **Sorghum bicolor** (L.) Moench
- Native to Ethiopia
  - First crop sown on newly cultivated land in 18th century Ethiopia
  - Drought tolerant
  - Breaks up soil, scavenges nutrients, roots build fertility through decomposition
- Introduced to America in 1757
- Widely grown in Kentucky since 1853
## Types of Sorghum

<table>
<thead>
<tr>
<th></th>
<th>Grain sorghum (Milo)</th>
<th>Forage sorghum</th>
<th>Sweet sorghum (Sorgo, Cane)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Height</strong></td>
<td>2-4’</td>
<td>6-12’</td>
<td>8-12’</td>
</tr>
<tr>
<td><strong>Bred for</strong></td>
<td>High grain:stalk ratio (dwarfing genes)</td>
<td>High dry matter content</td>
<td>High sugar content (15-20%) in juice</td>
</tr>
<tr>
<td><strong>Uses</strong></td>
<td>Livestock feed, biofuel, pet food, human food</td>
<td>Silage</td>
<td>Syrup, molasses, sugar, ethanol</td>
</tr>
<tr>
<td><strong>US Acres</strong></td>
<td>4.4 million</td>
<td>273,000</td>
<td>30,000</td>
</tr>
</tbody>
</table>
U.S. Sorghum Acres

Million acres

14
12
10
8
6
4

1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011

Planted  Harvested

5.47
4.43
Site selection

- Performs well on a wide range of soils
  - Prefers good drainage
- Sensitive to acidity (lime to pH >5.8)
- Low N requirement (~40 lb/ac)
  - No N necessary after legumes
  - Don’t plant after poultry litter application
- Out-competes many weeds
  - Tall, allelopathic
  - Plan for 1-2 cultivations between rows when plants are <12” tall
Planting

• Warm season crop
  – Drought tolerant
  – Heat tolerant
  – Grows slowly in cold
  – Frost sensitive

• Early-mid May planting is best; no later than early June

• Direct seed or transplant 2-3 week old seedlings for earlier harvest

• 3’ rows; 4-6” between plants
Harvest

• Hand
  – Tobacco knives, machetes, sharpened hoes

• Small machinery
  – Sickle bar mower, hedge trimmer

• Large machinery
  – Corn binder, forage chopper, in field juicer
Juice

- Juice extraction
  - Old roller mills extract 50-60% of stalk weight as juice
  - Short shelf life
Syrup

- Boil down to 78% sugar
- Batch or continuous flow pan
- Energy intensive, time consuming
Table 1. Yield of Sweet Sorghum Varieties at Blairsville, GA, and Quicksand, KY.¹

<table>
<thead>
<tr>
<th>Location and Variety</th>
<th>Stripped stalks</th>
<th>Syrup/ton of stalks</th>
<th>Syrup/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tons/acre</td>
<td>Gallons</td>
<td>Gallons</td>
</tr>
<tr>
<td>Blairsville, GA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brandes</td>
<td>18.7</td>
<td>11.7</td>
<td>219</td>
</tr>
<tr>
<td>Dale</td>
<td>18.6</td>
<td>13.1</td>
<td>243</td>
</tr>
<tr>
<td>Theis</td>
<td>17.9</td>
<td>11.6</td>
<td>208</td>
</tr>
<tr>
<td>Williams</td>
<td>19.9</td>
<td>16.6</td>
<td>328</td>
</tr>
<tr>
<td>Quicksand, KY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brandes</td>
<td>19.0</td>
<td>11.7</td>
<td>222</td>
</tr>
<tr>
<td>Dale</td>
<td>20.0</td>
<td>13.9</td>
<td>278</td>
</tr>
<tr>
<td>Theis</td>
<td>20.1</td>
<td>13.1</td>
<td>262</td>
</tr>
<tr>
<td>Williams</td>
<td>13.4</td>
<td>10.9</td>
<td>146</td>
</tr>
</tbody>
</table>

Economics

• Fixed & variable costs: $800-$1000/acre
• Labor accounts for more than half of cost
• Break even yield is 66 gallons per acre at $15 per gallon
• Average yield is 175 gallons per acre
• 200-300 gallons per acre possible
• $20-$25 per gallon possible
• $2,500 per acre return possible
Ethanol
“I wrote *Sweet Sweet Sorghum* to encourage more people to eat this luscious, nutritious food I have loved as long as I can remember. Sorghum is that rare food that is good, good for us, good for small farms and farm families, good for communities, and good for the earth…”

“Eco-friendly, anti-oxidant-rich, cash producing sorghum cane, which growers around the world use for food, fiber, and fuel, can support our farms and small communities. Those of us who love the small farms and farmers of Kentucky and the rest of Sorghum Nation have the future in our sticky hands.”

“If we eat it, growers will grow it.”
– Rona Roberts, 2011
National Sweet Sorghum Producers and Processors Association

- Annual meeting: February 16-18, 2012
  Pigeon Forge, Tennessee
- $20/year membership
- Newsletter, classifieds