Hybrid Forage SORGHUMS In Arizona

Robert L. Voigt

The use of hybrid forage sorghums is now coming of age in Arizona with the acceptance of proven hybrids that meet the quality standards demanded by farmers, dairymen and ranchers.

Since hybrid grain sorghums became available for the first time to all farmers in Arizona and across the nation on a commercial scale in 1956, naturally hybrid forage sorghums were not long in following. There have been some 20 hybrid forage sorghums brought into Arizona for testing or sale in the last three or four years with more expected each year.

Average Agronomic Performance for 2 years at 3 Locations of 3 Varieties and 4 Hybrids of Silage Sorghums.

<table>
<thead>
<tr>
<th>Entry</th>
<th>Yield in Tons/Acre at 30% Dry Matter</th>
<th>Lodging %</th>
<th>% Dry Matter at Cutting</th>
<th>Yield in % of Regular Hegari</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lindsey 101 F (H)</td>
<td>28.78</td>
<td>22</td>
<td>27.7</td>
<td>130</td>
</tr>
<tr>
<td>Northrup King 300 (H)</td>
<td>27.17</td>
<td>15</td>
<td>28.1</td>
<td>123</td>
</tr>
<tr>
<td>Tracy (V)</td>
<td>26.73</td>
<td>21</td>
<td>27.8</td>
<td>121</td>
</tr>
<tr>
<td>De Kalb FS-22 (H)</td>
<td>26.24</td>
<td>41</td>
<td>26.4</td>
<td>119</td>
</tr>
<tr>
<td>De Kalb FS-1A (H)</td>
<td>22.99</td>
<td>26</td>
<td>27.8</td>
<td>104</td>
</tr>
<tr>
<td>Gold Tag Mix (V)</td>
<td>22.32</td>
<td>11</td>
<td>27.1</td>
<td>101</td>
</tr>
<tr>
<td>Regular Hegari (V)</td>
<td>22.12</td>
<td>8</td>
<td>29.6</td>
<td>100</td>
</tr>
</tbody>
</table>

Grown in 1959 and 1960 at Tucson, Mesa, and Yuma Experimental Farms.

1(H) = Hybrid
(V) = Variety

The very different characteristics of hybrid forage sorghum and grain sorghum, growing in contiguous test plots at a University of Arizona experiment farm in Tucson, are examined by Dr. R. L. Voigt, at left, and Dr. L. S. Stith, right, the university’s Plant Breeders for forage and grain sorghums, respectively. Note contrast between the four foot grain sorghums in the foreground compared to the 10 foot height of the forage sorghum in the background.

Acreage, Yields Rising

Forage sorghum acreages in Arizona for silage increased by 31 per cent, and yields by 27 per cent in 1960 over the averages of the previous 11 years. This is in contrast to no change in yield and smaller acreages (currently 7,000 acres) of corn silage. Corn is not as well adapted to the warm Southwest. It has a problem of pollination at high temperatures and cannot tolerate periods of water shortage as well as sorghum.

In response to interest in and use of higher producing hybrids and varieties, together with improved management and fertilization practices, Arizona sorghum silage yields averaged 18 tons per acre in 1960, a 27 per cent increase over the 1949-1959 average of 14.2 tons.

According to U. S. Department of Agriculture figures, 1960 acreage for silage and forage sorghum in Arizona of 33,000 acres represents an increase of 25 per cent over the 1949-1959 average acreage. In contrast, the national acreage decreased 32 per cent for the same period.

What Is a Forage Sorghum?

Grain sorghum production involves primarily production of quality grain. The plant under it must meet only the requirements of producing the grain and the lodging it up at a convenient height until harvest time. Forage sorghums, on the other hand, not only require an upright plant but require the major emphasis of quality and yield to pertain to the whole plant with less emphasis on amount of grain alone or its quality.

"Height genes" have been manipulated by sorghum breeders so that the hybrid seed can be produced on plants of normal combine height. Different height genes in the sterile and restorer pollinator complement each other in the resulting forage sorghum hybrid grown by the farmers. A tall plant is produced with the desired tonnage of total plant material for forage use as green chop, silage, or fodder.

This increased tonnage of plant material from added plant height, coupled with hybrid vigor, has resulted in some high-producing forage sorghums which

Dr. Voigt is a member of the Plant Breeding Department, in charge of forage sorghum investigations.

Fall 1961

Page 10
yielded about 25 per cent over adapted standard varieties in tests in 1959 and 1960. Results are shown in the accompanying table.

**So It's Good To Eat**

Quality factors, such as sweet stalk and juicy stalk, have been considered desirable in a forage sorghum to make a high quality silage. A high ratio of leaf material to stalk is desirable at harvest, since the protein content of the leaves is more than three times that of the stalk. Previously, these characteristics had not been readily available in breeding stocks that were used to produce forage sorghum hybrids. Breeders have worked several years to combine sterility, the correct combination of height genes, sweet stalk, juicy stalk, leafiness, maturity, field standing ability and other characters into a desirable combination.

Through proper selection of parents for maturity, hybrids are "tailor made" for areas of a specific temperature and length of growing season. This is quite important in Arizona with its great climatic variation among agricultural areas.

**Lodging Was a Problem**

A few of the first hybrid forage sorghums grown in Arizona produced well but lodged badly, although they performed well elsewhere as excellent forage sorghum producers. Through tests by commercial companies, the University of Arizona and actual farmer use, information has been obtained on lodging-susceptibility of the better new varieties and hybrids. The more lodging-susceptible entries have now been withdrawn from the market or are not recommended in a certain area.

It is not yet clear why some hybrids lodge badly in a particular area and others of the same general production potential do not. University of Arizona yield tests over a two-year period showed that among adapted hybrids or varieties that were properly grown there was little difference in the percentage of dry matter at the correct time of cutting for silage.

**Cantaloup Meal For Beef Cattle Fattening Rations**

Farris Hubbert, Jr., W. H. Hale, John Kuhn, E. B. Stanley and Bruce Taylor

Cantaloup growers in Arizona have large surpluses of non-marketable cantaloups at the end of many growing seasons. This product can be processed for livestock use by drying and grinding through a hammer mill.

Previous studies at the Arizona Agricultural Experiment Station have shown that cantaloup meal can be used as a substitute for up to 50 per cent of the barley in a fattening ration fed for at least a 65-day feeding period.

A study was conducted at the Yuma Experiment Station from November 11, 1960 through March 17, 1961 (126 days) to evaluate dehydrated cantaloup meal as a replacement for 25 per cent and 50 per cent of the milo in a fattening ration. Forty-eight yearling steers of mixed breeding were allotted to six pens of eight animals each. All steers were implanted with 24 milligrams of stilbestrol at the beginning of the trial.

Chemical composition of the cantaloup meal used on an "as-fed" basis was: dry matter, 93.6%; crude protein, 16.4%; fat (ether extract), 2.2%; and phosphorus, 0.27%. The steers fed the 13 per cent cantaloup meal ration consumed an average of 3.5 pounds of the meal daily and those fed the 26.5 per cent level consumed an average of 6.3 pounds of cantaloup meal daily for the 126-day period.

Substitution of cantaloup meal for 25 per cent of the milo resulted in daily gains and feed consumption at least equal to that obtained with the ration containing no cantaloup meal. The higher level of cantaloup meal (50 per cent milo replacement) slightly depressed both feed intake and daily gain. No difficulty was experienced with any ration in keeping the cattle on feed.

This work indicates that well prepared, clean cantaloup meal is worth 106 to 109 per cent of the value of milo on the basis of feed required per unit of gain.