Table 1.—Seed set on two cytoplasmic male-sterile grain sorghums when pollinated at 2-day intervals.

<table>
<thead>
<tr>
<th>Days after bagging</th>
<th>Estimated seed set</th>
<th>Weight of seed per head</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Combine Kafir-60</td>
<td>White Martin</td>
</tr>
<tr>
<td>7</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>9</td>
<td>81</td>
<td>81</td>
</tr>
<tr>
<td>11</td>
<td>86</td>
<td>84</td>
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<tr>
<td>13</td>
<td>83</td>
<td>73</td>
</tr>
<tr>
<td>15</td>
<td>72</td>
<td>81</td>
</tr>
<tr>
<td>17</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>19</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>21</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>23-29</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Few seeds weighing less than 1 gram.

Sorghum varieties may differ in flowering habits with differences in seed set largely attributable to environment. Significant differences in seed set between Combine Kafir-60 and White Martin were obtained when the absolute percentages of the transformed percentages (arc sin), and the gram weights were compared by the "t" test. Significant correlations were found in the comparison of estimated seed set and actual seed set by weight for each variety as well as for the comparison of averages.

Male-sterile sorghums exposed to hot, dry winds may give a poor seed set whether they are bagged or exposed to wind pollination. In hybrid sorghum seed production it is important to have the seed parents and pollinators in bloom at about the same time although some of the florets in a panicle may be receptive over a period of 15 to 17 days. Also there is a considerable range in the time of blooming of individual heads in a field.—W. M. Ross, Research Agronomist, Field Crops Research Branch, A.R.S., U.S.D.A.

**DIFFERENTIAL STAINING OF POLLEN TUBES IN GRASS PISTILS**

In connection with studies on seed set of Dallisgrass, several techniques were developed for observing pollen tubes in the pistil. Pope (5) found that staining the starch in the pollen tube with iodine gave satisfactory results. Adams (4) described a staining technique which was successful for determining pollen growth of pollen tubes in the styles of corn. Shands (2) used Lacmoid-martius-yellow in observing pollen grains in oats. None of these methods were successful with Dallisgrass. Other methods were devised and two of these proved highly satisfactory for staining pollen tubes in the pistils of Dallisgrass.

For temporary micro-slides, a modification of the technique of Pope (4) technique gave the most satisfactory results. The procedures are as follows:

1. Pistils are fixed in formalin-acetic alcohol. (U n d e r refrigerator conditions the mounts may be preserved as long as needed.)
2. Transfer to a sodium hypochlorite solution of commercial clorox to 95 cc. distilled water plus 10 minutes. (A 20% solution plus a time of 1 hour is more satisfactory with some pistils.)
3. Stain with 1% aqueous Lacmoid solution plus a time of 10 minutes.
4. Rinse with distilled water until no dye is removed from ovarian tissue.
5. Mount in a Lacmoid solution (made by mixing above 1% Lacmoid to a light blue color) and squash a squashed preparation by exerting moderate pressure on the cover slip.
6. Observe immediately or store in a refrigerated chamber. (U n d e r refrigerated conditions the mounts may be preserved as long as needed.)

In these preparations the pollen tubes can be distinguished in all parts of the pistil from the time they enter the stigma until they penetrate the ovule (figure 1). The cytoplasm stains blue while the carpellary tissue remains almost colorless. In the older portions of the tube where no cytoplasm is present, callose plugs can be observed at intervals as dark blue dots. The nuclei in the tube are distinguished only in the less dense or wider portions of the tube (figure 2).

Results similar to the above have been obtained from the pollen tubes of Johnsongrass and Dallisgrass. As a result of the bleaching action of the removal of the pigment enables the observer to follow the course of the pollen tube within the pistil. On the basis of the observations made on Johnsongrass and Dallisgrass, it appears that this technique could have wide application in the grass family.

The second method, which has proved to be a good basis for the preparation of permanent slides, involves the following procedure:

1. Pistils are fixed in formalin-acetic alcohol.
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