HETEROSIS IN $F_1$ HYBRIDS OF SORGHUM $\times$ S. sudanense AND S. sudanense $\times$ S. arundinaceum

SUDAN GRASS (Sorghum sudanense) and grain or forage sorghum (Sorghum vulgare) each has 10 pairs of chromosomes and cross easily with each other. Both species possess desirable forage traits. No report has been found of the performance of the first artificial hybrid between these two species, even though reports of hybridization were made as early as 1925.

This paper reports investigations in which the performance of the $F_1$ hybrids, sorghum $\times$ Sudan grass, was compared with the Sudan grass parents and four forage sorghums. The development of a male-sterile Kafir in both species is also reported.

Experimental Procedure

During the summer of 1956 crosses were made between a male-sterile Kafir (combine Kafir 60) and grain (F.C. 35707) and male-sterile Kafir and Sudan grass (S. arundinaceum (P.I. 156540) and Sudan grass (S. sudanense (Piper) Stapf.). Crosses were made by planting the male-sterile Kafir in rows with the Sudan grass in isolation to prevent contamination by foreign pollen.

The $F_1$ hybrids, the Sudan grass parents and forage sorghums (NK 3055, NK 3665, DK 3055, and Frontier S-210) were planted in a randomized block design at 3 locations in Georgia. The male sterile Kafir parent, a grain sorghum type, produces very little forage and does not recover as well after clipping as do the forage sorghums. For this reason, the average yield of the forage sorghums (NK 33707, NK 3055, and Frontier S-210) is representative of the Sudangrass in isolation to practical comparison could not be made on forage production between the artificial hybrid and the Sudan grass. Comparisons between the parental type, a grain sorghum type, produces very little forage and does not recover as well after clipping as do the forage sorghums. The Sudangrass averaged 68% of the average yield of the forage sorghums.

Three clippings were made at each location for dry matter determinations. The leaf-stem ratio was determined as a measurement of forage quality.

Results and Discussion

At each location the $F_1$ hybrids were statistically better in dry matter per acre compared with the Sudangrass parents and forage sorghums. This was an increase of 29.3% which may be attributable to heterosis. The Sudangrass hybrid was not as leafy as the Sudangrass, which suggests a lower quality forage. The Sudangrass averaged 68% of the average yield of the forage sorghums.