

IDT7-063 | Combining ability and heterosis in rabi Sorghum (*Sorghum bicolor* (L.) Moench) hybrids for yield and drought Parameters

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Present investigation was carried out to identify elite parental lines and heterotic hybrids of rabi sorghum (*Sorghum bicolor* (L.) Moench) for grain yield, fodder yield and drought parameters. The experiment was confined to fifteen hybrids, developed through line x tester method, by utilizing three widely adapted females lines (M-35-1, Phule Anuradha, Parbhani Moti) and five testers (10538,4189,10515,10704,10593). The results revealed, presence of significant differences due to parents, crosses, parents vs crosses and line x tester for almost all the traits. The ratio of σ^2_{gca} : σ^2_{sca} variance for general and specific combining ability was less than unity for all the characters indicating preponderance of non additive gene action. Parents; Phule Anuradha, 10593 and 10515 showed significant gca effects in desirable di-

rection for grain, fodder yield and drought related traits. Significant sca effects and heterosis along with high per se mean were observed in crosses Phule Anuradha X 10515 (7.85 and 75.76%) and Parbhani Moti X 10704 (6.66 and 32.81%) for grain yield/plant and in Phule Anuradha x 10538 (20.06 and 45.41%) for fodder yield/plant. Two crosses, M-35-1 X 10593 and Phule Anuradha X 10515, exhibited significantly high SCA effects, heterobeltiosis and mean performance for grain yield, fodder yield, days to 50% flowering, leaf area, chlorophyll content and harvest index. These hybrids may be advanced to further generations to select best segregates and the parents Phule Anuradha, M-35-1 10515 and 10593 has scope to breed high yielding genotypes with early maturity duration adaptable to dry land farming.

IDT7-064 | Advances of groundnut breeding and seed systems in Tanzania

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Groundnut (*Arachis hypogea* L.) is an important oilseed crop, mainly grown by smallholder farmers on 839,631 ha in four agro-ecological zones (Lake, central, western and southern) of Tanzania. The average yield is 965kg/ha with a national production of 810,000 tons. The major production constraints are foliar diseases (rosette, early leaf spot, late leaf spot, and rust), drought, aflatoxin contamination, and low soil fertility. This paper explores the advances made in a breeding program to solve these challenges. The genotype by environment interaction with linkage to good agronomic practices, using effective selection molecular tools, was used and significant achievements were recorded. Eight improved varieties were released with support from ICRISAT-led programs. The newly-released varieties command high-yielding ability (1800-2500 kg/ha), and tolerance to rosette disease and drought, and are highly preferred by farmers

and market. The improved varieties increased yields and productivity at the farm level and groundnut production from 400,000-810000 tons over the last 10 years.

Effective seed delivery to smallholder farmers did not automatically follow. The Tropical Legumes Project, through NARI, designed rural seed fairs which are used to create awareness, increase accessibility, and create working contacts among community seed producers. Other seed delivery models tested and used include: farmer research groups, demonstrations, field days, community seed production, radio and TV events, political figures' engagement and multi-stakeholder engagements. These models have raised awareness, increased demand of improved seed, and enhanced smallholder seed supply at affordable price with a significant number of beneficiaries reached (1,600,000 farmers).