IDT7-077 | Field screening finger millet germplasm for drought tolerance

Ojulong HF[1]*, Sheunda P[1], Mgonja F[2], Kibuka J[1], Otwani D[1], E. Manyasa[1]

[1]International Crops Research Institute for Semi-Arid Tropics (ICRISAT) Box 39063-00623, Nairobi, Kenya.
[2]Selian Agricultural research Institute, PO Box 6024, Arusha, Tanzania
*E-mail: H.Ojulong@CGIAR.ORG

Drought stress is the most important abiotic constraint limiting finger millet production. Limited research on tolerance to drought in finger millet has been done in Africa. As a result, the only varieties adapted to high-rainfall regions have been developed and promoted. Twenty-four potential drought-tolerant varieties selected from regional trials, and a short-duration commercial check (U15), were screened for drought in three locations in Kenya (KALRO-Kiboko, KALRO-Kampiya Mawe (KYM)) and Tanzania (DRD-Miwaleni). Genotype was significant for all the traits, location for all except yield, and GxL interaction for all except plant height. Sixteen of the varieties outperformed the commercial check (1.10 tha-1), with the best yielders being IE2187 (2.02 tha-1), IEFV0009 (1.50 tha-1), IE501 (1.1.48tha-1), IE593 (1.45 tha-1) and IE2030 (1.43 tha-1). All varieties except one had shorter DAP than the commercial variety. GGE biplot for yield showed Kiboko and Miwaleni locations to be effective in discriminating genotypes. Genotypes IE501, IE593, were specifically adapted to the Kiboko environment while IE546, KNE 741 and IE5791 were more adapted to the Miwaleni environment. Genotypes IE3104, IE5736, IE5733, IE6475 and IEFV0009 were stable across locations. Principal component analysis revealed the first four PC accounted for 85.72% of the variation with plant height, agronomic score, biomass, number of lodged plants, and number of productive tillers contributing the most. Five of the varieties -- IE2187, IEFV0009, IE501, IE593 and IE2030 -- have been advanced to PVS in Kenya and Tanzania, while KNE 741 is at NPT in Kenya.

IDT7-078 | Current status of groundnut improvement in Uganda

Okello D. K.[1]*, Ugen M. A.[1], Odong T. L. [2], Monyo E.[3], Akpo E. [3], Okori P. [4], Deom C. M.[5]

[1]Department of Groundnut Improvement, National Semi-Arid Resources Research Institute,
[2]Department of Crop Production, School of Agricultural Sciences, Makerere University,
[3]International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Nairobi, Kenya
[4]International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Lilongwe, Malawi
[5]Department of Pathology, University of Georgia, Athens, USA.
*E-mail:kod143@gmail.com

In Uganda, groundnut (*Arachis hypogaea* L) is the second most important legume after beans. Groundnuts is cultivated on nearly 260,000 ha, representing 24.6% of the total arable land. On-farm pod yields are low, averaging 800 kg/ha of dry pods, compared to on-station potential yields of 3,000kg/ha. Sales from current production could potentially generate $344 million to the producers who are largely small-scale farmers. The yield gaps are attributed to a combination of biotic, abiotic, cultural and political factors. Since the 1920s, research efforts have released 24 varieties, the most recent commercial varieties being the Serenut 1-14 series. These varieties have overcome some of the mentioned production constraints. However, varied growing agroecologies, land tenure systems, diverse market preferences, and emerging stresses call for continuous research. Current research agenda includes breeding for high oleic, leafminer resistance, confectionery, aflatoxin tolerance, drought tolerance, early to medium maturing varieties, high yielding, and rosette disease resistant varieties. We have initiated Marker Assisted Selection for high oleic breeding and adopted BMS for Digitalization of data capture, management, analyses and storage. Recently developed regeneration protocol will aid in introgressing additional traits across taxa. The bimodal rainfall pattern and active hybridization programme increases our breeding cycles. To date, the groundnut breeding program has an active breeding pipeline frequently releasing varieties and lines which have already been shared with National Programs across Africa, Haiti and the USA with many additional National Programs making requests. We have strong partnerships in Research and Development among the African Countries, USAID, ICRISAT, and BMGF.