IAEA Technical Cooperation Programme

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Increasing crop productivity in Sudan

The challenge…

With the support of IAEA technical cooperation (TC) projects and national research programmes, Sudan has been able to develop a number of new crop varieties which show great potential for increased productivity. However, further support was required to enhance capacities and to accelerate the adoption of new varieties, with the ultimate aims of improving the livelihood of farmers and meeting the demands of consumers and industry.

For example, nuclear techniques were required to expand the production of established varieties in banana and wheat lines, and new production packages, comprising a new crop variety together with a new cultivation technology and crop management system, were needed to increase productivity in sugarcane and tomatoes.

The project…

Through an IAEA technical cooperation project, support was provided to address capacity gaps and to improve the adoption of new varieties. For example, capacity to produce seedlings for a banana mutant variety developed under an earlier TC project was developed, and nuclear techniques were used to identify and produce the fertilizer and water requirement packages needed to support the rollout of newly developed doubled haploid wheat varieties and mutant tomato varieties resistant to tomato yellow leaf curl geminivirus (TYLCV).

Training, fellowships and scientific visits covered topics such as banana propagation, techniques for the genetic improvement of cereal crops and the development of regulations and quality control techniques.

Rainout shelter and new tomato variety in the field.

The impact…

The project built capacity and trained young researchers, and in addition, two tomato varieties resistant to TYLCV were released (Sinar-4 and Sinar-8). Both had higher fruit yield (above 35 t/ha), earlier harvesting, better fruit quality (double the fruit size and increased firmness) and higher tolerance to TYLCV and powdery mildew in comparison not only to their parent variety but also to the most commonly grown commercial tomato cultivars.

A rainout shelter for the screening and characterization of drought tolerant sorghum mutants and a plant growth chamber for the development and screening of mutant doubled haploid wheat were constructed, and the molecular laboratory at Sudan's Biotechnology Centre was also upgraded.

The sustainability of the project was ensured by its participatory approach: farmers, the extension service, the seed industry and millers were included, ensuring ownership by the beneficiaries. A small income is being generated from biofertilizer and the distribution of banana planting materials, which will support activities after the TC project ends.

Technical cooperation project SUD/5/030: Increasing Productivity of Selected Crops Using Nuclear Related Techniques