



Protecting the nation's potato gene bank

The Agricultural Research Council (ARC), historically a hub of excellence in research and development, is widely considered a leading expert in agricultural science in South Africa and the continent. The organisation has for decades built and continues to nurture strong partnerships with various stakeholders, including universities, agricultural industries, governmental organisations, as well as national and international industry partners.

The organisation consistently works with food producers, key stakeholders and government departments to ensure they deliver research needs, based on requests from industry. All agricultural research carried out by the ARC is geared at supporting both commercial and small-scale farmers, as well as other agricultural organisations. For example, with regards to the potato industry, the ARC interacts with, and supports, approximately 540 farmers, farming on 55 000ha, bringing in a farm gate value of R7.1 billion per annum.

Potato is an important agricultural crop and is the second largest field crop grown in 16 different production regions, under a wide range of soil and climatic conditions. As a summer crop, planting season for potatoes is already underway across the country.

Since the early 1960's, when the South African breeding programme was established, the ARC has supported the South African potato industry with innovative, needs-driven, environment friendly research, technology development, technology transfer and scientific solutions to improve potato production in the country, in support of a sustainable industry.

The aim of the breeding programme is to release suitable, well-adapted varieties to local conditions in Africa. Potato production in South Africa increased dramatically after the release of the first locally developed varieties, which were adapted to short day conditions and resistant/tolerant to the prevailing pests and diseases. For example, in partnerships with Potato SA, the ARC maintains Simba's materials disease-free.

The ARC continues to play a major role in the development and compilation of technologies as well as knowledge on production practices of potatoes. Their multidisciplinary projects contribute to an increased availability and diversity of crops in South Africa as a valuable contribution to food security and maintaining biodiversity.

The ARC have established a proud record of service to the agricultural industry and has a large number of the potato and vegetable cultivars planted in South Africa at present, that have been developed by the organisation. The local potato breeding programme ensures the continued flourishing of the potato industry and guarantees that material will be available to all role-players in South Africa and the

rest of Africa. To date, the ARC has released 22 potato cultivars, with two more up for registration. They will be released to the industry through its commercialisation process.

Over recent decades, the need for conservation of plant genetic resources has become increasingly urgent as a result of the rapid depletion in the total naturally occurring genetic diversity on the planet. In an attempt to curb further biodiversity loss, many countries and institutions, including the ARC, have established gene banks for the conservation of their precious plant genetic resources. The core purpose of the gene banks is the conservation and management of genes or plant genotypes, from wild and cultivated species outside of their natural habitat, for current and future use. The ARC continues to be custodian of the gene bank for country and many countries on the African continent.

In fact, the gene banks are the actual starting point of 90% of ARC-Vegetable and Ornamental Plants at Roodeplaat, research campus outside Pretoria outputs. Although the role of gene banks in facilitating research is unquestionable, their role in primarily securing and maintaining the germplasm of a variety of plant, insect, fungi and bacteria species, as well as DNA and gene constructs related to vegetables, medicinal and ornamental plant species is invaluable.

In the past, the ARC's potato varieties reached a 10% market share and the target is to reach this again by 2025 and to increase this market share to 30% by 2035 thus playing a greater role in nutrition and food security. Without the germplasm collections and the transformation of the industry, this will not be possible which will put the nation's food security at high risk and in the wrong hands.

The ARC has also implemented a system of DNA fingerprinting to ensure that going forward no material will be released to any client without a certificate of authenticity. They have also re-established their entire national cultivar collection to ensure the material is propagated from a sole source and similar processes are in progress and will be implemented in collaboration with all ARC clients to ensure that varieties maintained by the ARC are true to type.

About the Agricultural Research Council

The Agricultural Research Council is a premier science institution that conducts research with partners, develops human capital and fosters innovation in support of the agricultural sector. The ARC provides diagnostic, laboratory, analytical, agricultural engineering services, post-harvest technology development, agrochemical evaluation, consultation and advisory services, food processing technology services as well as various surveys and training interventions. For more information, visit the ARC website at www.arc.agric.za or download the ARC Hub App at archub.agric.za, also available on Android and IOS.