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Pigeon pea revolution in South Africa

Neglected crop presents major opportunities

Pigeon peas originated thousands of years ago in India, where they are still grown as an important source of food for both people and animals. India is the largest producer, importer, and consumer of pigeon pea. In Africa, pigeon pea is primarily a subsistence crop; however, it is grown in more than 33 countries, with Malawi, Tanzania, Kenya and Uganda supplying the export market. Production in the Southern Africa region contributes a lower portion to the world's total production. An indication of the market potential for the crop in the global market shows the demand is still higher than the supply. In South Africa, there are little or no records of large-scale or field production of pigeon pea. Since pigeon pea is not widely grown in South Africa, there is a limited supply of the crop, lack of availability of improved seeds, and markets. However, unimproved

long-duration pigeon pea landraces are grown as shade plants in home gardens, where only a few long rows are planted for their own consumption. Information on its cooking methods, agricultural production technologies and other uses of the crop in the country are still not properly documented.

Pigeon pea, a legume crop, is a source of food and income generation in many parts of the country. However, it is still identified as underutilized in the country since its potential has not been well exploited. Apart from its potential to contribute to the food security of the nation, the crop has the potential to alleviate poverty through income generation and also improve human health (both nutritional and medicinal values). It has enormous potential for improving smallholder farmers' livelihoods throughout the region through popularization and commercialization. Another importance of the

crop is that it can survive adverse conditions related to climate change and marginal soils issues. Basically, the high cost of production inputs is part of the limiting factors for crop production, which is largely a challenge for resource-poor farmers farming on marginal lands. On the contrary, pigeon pea requires low production input and technical know-how. Soil fertility improvement capability of the crop is another importance of the crop. Pigeon peas, a legume, have the advantage of fixing atmospheric nitrogen for their own needs and for soil enrichment, thereby reducing the cost of chemical fertilizer inputs in crop farming. Grain legumes such as pigeon pea can play an alternative role as a source of organic fertilizer due to their ability to enhance soil fertility through nitrogen fixation mechanism and are plant-based protein-rich legumes. The potential of pigeon pea as a soil fertility improvement crop has not been exploited to any appreciable extent and the amount of land cultivated for pigeon pea in South Africa is very negligible.

Despite the importance of this crop in terms of food and nutrition, the crop has not been promoted by the national extension system in South Africa. This is due to the fact that there is no attention given to the crop in funding policy for research and development because it is considered an underutilized and orphan crop of poor communities. Furthermore, the overemphasis on cereal crops in the current production systems as the major food security and cash crop in South Africa has relegated pigeon pea in particular and legumes in general as minor crops. Pigeon pea is a perennial crop and farming this crop in the region is largely dependent on seasonal rainfall patterns. The few farmers that are into pigeon pea production make use of local landraces with low yields. The fact that there is little or no information on the modern agricultural



Cultivation and marking of the pigeon pea plots



Pigeon fields during the season



technologies of its production including breeding and agronomic practices under South African conditions necessitates an urgent need for research on the crop. It is important to investigate and understand the agronomic practices that could optimize the growth, development and grain yield of the crop. To make this crop work for the South Africa and its farming communities, it is important to plan an intense research and development effort to discover the best variety of pigeon pea plants and seeds to work with small- and large-scale commercial farmers for production and utilization. This will involve experiments in the laboratory, in the field and through on-farm trials with the participating communities to identify the genotypes on the basis of their interest traits.

The first step in boosting the production and increased nutrition in this underutilized crop is to build a better and adaptable pigeon pea germplasm that is ideally suited for the South African dry land climate. To make pigeon pea more commercially appealing in South and Southern Africa, they should have traits such as early maturity, high yielding, good storage potential, pests and diseases resistance, and tolerant to drought, salt-affected soils and other environmental stresses. Presently, the Agricultural Research Council is busy with various studies related to the optimum production of pigeon pea and pre-breeding to assist with means of increasing food security in the country. One of the studies includes an evaluation of introduced pigeon pea varieties' adaptability in different locations in South Africa. This also involves the determination of the genetic

diversity of these varieties through phenotypic and genotypic means. Since there is a lack of information on agronomic practices for pigeon pea in South Africa, another study is focused on the determination of best agronomic practices (plant population, planting dates and optimum nitrogen fertilizer rates) that will optimize pigeon pea production in South Africa.

Identification of farmers that are involved in the production of the crop is underway and there are also plans to involve them in the research program for identification of farmers' choice of traits to channel the breeding program of ARC towards farmers' needs. Further, there are plans for on-farm trials for ease of knowledge transfer. The on-farm trials are targeted toward different agronomic and management practices such as land cultivation, planting dates, crop rotation and intercropping. The involvement of extension practitioners as major role

players cannot be over-emphasized. They serve as the link between the farmers and the research, they are going to be actively engaged in this program. The bigger picture of the impact of ARC for this program is to witness South Africa getting into the pigeon pea international market. ■

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Pigeon pea at flowering and maturity stages

