

QUALITY VEGETABLE SEED SUPPLY

How good quality seed of AVRDC-developed tomato varieties offers more options to farmers in Eastern and Southern Africa



Quality seed of vegetable varieties with high levels of pest and disease resistance can stimulate agricultural production in low income countries, but seed supplies are often insufficient. Private and public sector seed producers do not have capacity in vegetable breeding, and seed imported from high income countries with temperate climates usually performs poorly in tropical fields. For 40 years, AVRDC – The World Vegetable Center has developed improved vegetable varieties for poor smallholder farmers in the tropics. DFID provides core funding to AVRDC for research and development activities to enhance vegetable production and consumption worldwide.

A recent study quantified the adoption of improved tomato varieties in Eastern and Southern Africa. 68 seed producers in 10 countries provided data on seed sales of the varieties they market, and the usage of AVRDC material in these varieties. The findings show the impact is substantial but not evenly spread across the region, which points toward opportunities for wider impact.

Introduction

AVRDC – The World Vegetable Center has collected vegetable germplasm from around the world since the early 1970s. The Center’s plant breeders use accessions from this collection to produce a range of improved vegetable lines with good agronomic characteristics, high yield, specific fruit characteristics (e.g. taste, shape, shelf life, nutrient content), and resistance or tolerance to heat, drought, flooding, pests and diseases, or other factors. Private and public sector breeding programs freely use these lines as parent material in their own crop improvement programs, or sometimes simply screen lines and directly release the best ones as varieties to farmers.

AVRDC and the Tanzanian-based consultancy Artisans 4 Development conducted a study to quantify adoption rates of AVRDC improved tomato varieties in 10 countries of Eastern and Southern Africa. Data were collected in 2014 from 68 seed companies and public sector seed producers by means of a structured questionnaire and personal interviews.

Research Findings

There are 92 tomato varieties commercially available in the 10 countries studied. Nine of these varieties were pure AVRDC lines (released without modification). There were no varieties developed by combining AVRDC material with other parental material.

Tomato seed sales were estimated to be 88 tons in 2013, with Kenya and Tanzania accounting for 64% of this seed production. AVRDC-developed varieties accounted for 87% of seed sales in Tanzania, 60% in Burundi, 51% in Madagascar, 11% in Uganda and 7% in Malawi, but none in Kenya, Ethiopia, Mozambique and Rwanda. Two AVRDC-developed varieties, 'Tanya' and 'Tengeru-97', accounted for 34% of the regional tomato seed market in 2013.

AVRDC-developed varieties account for 34% of the regional tomato seed market in Eastern and Southern Africa and 87% of the Tanzanian seed market.

Outcomes and Impacts

The study estimated a total planted area of 0.17 million ha under tomato in East and Southern Africa in 2013. Of the estimated 0.65 million farmers growing tomatoes, 27% used AVRDC-developed varieties in 2013/14. Adoption was by far the highest in Tanzania, where 80% of the tomato farmers used AVRDC varieties and 87% of the tomato seed sold was AVRDC material.

The varieties 'Tanya' and 'Tengeru-97' were introduced to Tanzania in the mid-1990s and subsequently released by the Tanzanian Horticultural Research Institute in 1997. The introduction of these varieties had been made possible because of the liberalization of the seed sector in the early 1990s.

'Tanya' and 'Tengeru-97' were more resistant to pests and diseases than the varieties that they replaced, which had been imported from temperate countries and were not adapted to growing conditions in Eastern Africa. These two improved varieties produced higher yields under farmers' conditions. The fruit of 'Tanya'

and 'Tengeru-97' has firmer flesh, making it ideal for transportation over bumpy roads, and has a long shelf life, lasting up to three weeks at room temperature. 'Tanya' and 'Tengeru-97' were also popular with consumers, as the fruit is juicy and suitable for eating fresh or cooked.

The two varieties led to a rapid increase in tomato production in Tanzania. Local tomato processors found the two varieties, especially 'Tanya', suitable for the production of tomato ketchup and tomato paste. Supplying processors has created a market opportunity for tomato farmers.

Table 1. Tomato seed sales in 10 Eastern and Southern African countries and share of AVRDC germplasm use, 2013/14

Country	Seed sales (t/year)	AVRDC lines (% of seed sales)
Burundi	1.6	59.9
Ethiopia	3.5	-
Kenya	25.8	-
Madagascar	0.8	51.2
Malawi	5.4	7.1
Mozambique	2.2	-
Rwanda	1.6	-
Tanzania	30.2	86.9
Uganda	12.3	10.8
Zimbabwe	4.4	4.6
Total	87.8	33.7

Wider environment

Improved vegetable varieties with high levels of pest and disease resistance can stimulate agricultural production in low income countries, but the supply of quality seed is often a serious limitation. Local seed producers in Eastern and Southern Africa can conduct variety selection trials, but do not have the capacity for vegetable breeding. They rely on open-pollinated varieties from AVRDC, or varieties imported from other countries that may not be suitable for local growing conditions. Multinational companies with breeding capacity have recently entered the market, but their focus is on hybrid seed, which accounted for only 2.3% of seed sales in 2013. Improved vegetable varieties from AVRDC are therefore important for public organizations and local seed companies to supply farmers with quality seed.

Next steps

Data presented here are part of a wider study to quantify the economic impact of improved varieties and articulate the impact pathway of AVRDC germplasm in Africa and Asia. This information will be used to adjust priorities in AVRDC's crop improvement programs, and to design new strategies for making a wider impact.

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