

## A BULLETIN OF THE TROPICAL LEGUMES II PROJECT



Changing landscape as chickpeas replace significant areas previously under the cereal teff.

### Chickpea in Ethiopia - Changing landscapes and Changing Lives

As recently as five years ago a drive through Ethiopia's countryside would have meant driving through lush fields of teff – a small grain cereal that is the primary ingredient of *injera*, the bread that accompanies every Ethiopian meal. Today a drive through the Ethiopian countryside means driving through lush fields of chickpea – a dramatic change as farmers respond to global market demands and grasp at the chance of making a profit.

Chickpea has become an important legume, accounting for more than 15% of Ethiopian legumes with about one

million households engaged in its production (CSA 2010). It is considered to be less labor intensive compared to many field crops (Minale et al. 2009) as its production is towards the end of the cropping season when there is less weed pressure and less soil water management problems (drainage).

The crop is also known for soil nitrogen enrichment, rotational advantages and cheaper cost of production as compared to other crops such as wheat. Chickpea is a popular addition to the Ethiopian diet and is consumed in a variety of preparations such as snacks, curry, blend, green pea and salads.

A farmer for 26 years, Temegnush Dhabi in East Shewa has recently been doing things differently. "For the last four years I have been growing the modern white chickpea varieties. There is no question in my mind. I will keep growing these new varieties."

The white chickpea Dhabi refers to is kabuli chickpea. There is a huge global demand for kabuli chickpea and farmers who can produce the right variety with the right seed size can earn a premium of about USD 1000 per ton.

Dhabi is one of the approximately 1 million farmers in Ethiopia or one of 44.5 million in sub-Saharan Africa and South Asia who are



Temegnush Dhabi a woman farmer in East Shewa showing off one of her earnings from chickpea farming.



already benefitting from the Tropical Legumes II (TLII) project. Since 2007, the project, funded by the Bill & Melinda Gates Foundation and implemented by a number of members of the CGIAR Consortium and national partners, has been working towards improving the livelihoods of smallholder farmers by enhancing the production and productivity of legumes and providing the right training and information. By including these nutritious and resilient legumes that are suited to the climate in their farming systems, farmers are able to diversify their activities, earn a profit, and also promote soil health.

more than four times in certain well-adopted areas that follow the recommended agronomic practices for each variety. Under best production conditions these packages for chickpea can yield more than 4t/ha in Ethiopia. There has also been a tremendous achievement in seed size, quality, resistance levels and other attributes in the present varieties of the crop.

A molecular breeding approach is being streamlined into the national breeding program in close collaboration with ICRISAT's Tropical Legume and The Generation Challenge Programs (GCP) supported by the Bill & Melinda Gates

Foundation. For the last four years, in parallel to the conventional breeding programs, Marker Assisted Breeding, Marker Assisted Recurrent Selection and Marker Assisted Backcrossing are being used in the development of cultivars with specific traits, particularly drought resistance. Assistance has also been provided in terms of capacity enhancement programs run both on human resources, infrastructure (cold room, green house etc.) and facilities for research.

The large-scale adoption of a new variety means that a lot of seed must be made available to farmers. In anticipation of this need, the TLII project trained selected farmers in the correct methods of seed production. Bedilu Mamo is one of these newly trained seed producers in Memhir

Hager village. He produced 3.5 tons of Arerti seed to sell. "I expect a minimum of 30,000 Birr (USD 1,700) from the sale of seed this year," he says. Mamo will use this money to pay for school fees for his children and reinvest in better technologies for his farm.

As new varieties have been developed and adopted, there has also been a major shift in chickpea cropping practices. Chickpea was traditionally grown using residual moisture and



Ethiopian farmer carrying his produce home.

In order for chickpea producers in Ethiopia to capture the profits of the export market, they have to grow chickpea varieties that match the growing conditions in the country with market requirements. After identifying major challenges of chickpea (low productivity, biotic and abiotic stresses, ecological), the Ethiopian breeding program embarked on landrace evaluation and germplasm enhancement using parental crossing with germplasm acquired from CGIAR centers (mainly ICRISAT and ICARDA) to develop new varieties.

One of these is 'Arerti' - a kabuli variety with a name that means 'not afraid of drought.' A series of tests and on-farm demonstrations, as well as training conducted by the Ethiopian Institute for Agricultural Research (EIAR) through the TLII project, determined the potential of Arerti in Ethiopia and introduced farmers to the variety. Arerti has increased farmers' yields from around 600-700 kg per hectare to around 1,700 kg per hectare.

Taken together the recently developed varieties have a yield advantage that is more than double the national level (which was 600 – 700kg/ha) and in some cases even



Bedilu Mamo a newly trained seed producer from Memhir Hager village.

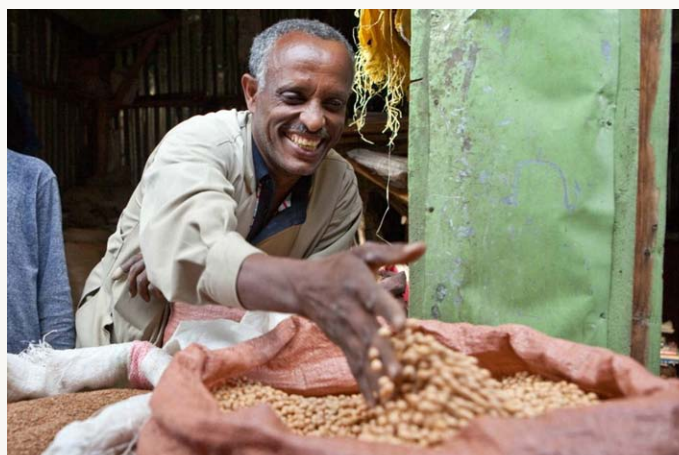


as such was only planted towards the end of the season. More recent research supported through the Tropical Legumes II project on planting dates and associated crop husbandry practices has developed agronomic practices that are capable of doubling yields and producing high-quality grain. Thus, it becomes imperative to adopt the corresponding crop management practices when choosing a variety.

This was brought to the attention of farmers through the TL-II executed Farmer Participatory Variety Selection (FPVS) trials linked with demonstrations of good agronomic practices. As a result, the planting date has been shifted back by at least one month so that the crop will have sufficient moisture supply until fertilization and grain fill. Excess soil moisture management has to be introduced along with advanced planting dates through use of the broad bed and furrow technique. These, plus improved varieties, have revolutionized chickpea production and productivity in Ethiopia.

Gebeyehu Melesse is both, a farmer in the city of Gonder and a shop owner in Casa Nchis, a small neighborhood in Ethiopia's capital Addis Ababa. The streets here are crowded with tiny shops and bags of grain bearing the price of kabuli chickpea – Ethiopian Birr (ETB) 20. (USD 1 = ETB 18).

As the chickpea makes its way from fields to markets it increases in price – reflecting the costs of transport as well as any cleaning and grading that may have been carried out. The



Gebeyehu Melesse a farmer from Gonder who also owns a shop in Casa Nchis, a small neighborhood in Ethiopia's capital Addis Ababa.



The Agricultural Commodities Supply (ACOS) Company provides the link between the farmers and export market – in addition to employment.

chickpea continues to change hands in a varying number of transactions as small traders like Melesse sell to larger brokers who bulk up the chickpea into more desirable amounts for export companies who need to trade in large volumes.

ACOS Ethiopia is one of the largest chickpea export companies in the country. Established in 2005, ACOS mostly serves the canning industries in the UK, Spain, Germany and Italy. There are also new markets opening up in the USA, Canada and the Middle East. Vast quantities of chickpea move through an assembly line on conveyor belts where the grain is checked for pests and sorted by color and size. The cleaned and graded chickpeas are then transported to the EU via Djibouti through a supply chain that takes 20-30 days for completion.

Today, Ethiopia has established itself as the leading producer, consumer and seller of chickpea in Africa, and is among the six most important producers in the world (Minale et al. 2009). The major contributor to the increase in chickpea production is the dramatic productivity improvement of the crop rather than area expansion (Figure 1).

The average productivity level of 1.7 t/ha is among the highest recorded globally and double the global average. The crop production is mainly concentrated in four regional states with Amhara region taking the lead (Figure 2).

ACOS cannot satisfy the demand for chickpea. They are working to increase their network of traders and exploring options such as contract farming with smallholder farmers



Figure 1. Productivity and production improvement of chickpea in Ethiopia (Source: Central statistics authority of Ethiopia 2000-2012).

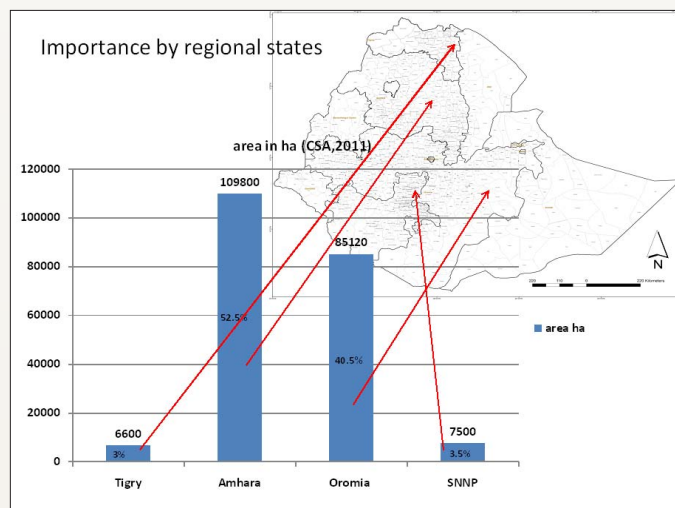


Figure 2. Geographical distribution of chickpea production in Ethiopia.

in order to ensure a consistent supply of chickpea. As the demand for chickpea continues to grow, Ethiopian farmers are well-positioned to earn better incomes and improve soil fertility on their limited land.

The TL-II strategy is to fast track testing and adoption of existing varieties and advanced breeding lines for use by farmers; generate new farmer- and market-preferred varieties with desirable traits (high yields, tolerance to moisture stress, and resistance to pests and diseases); and establish decentralized, pro-poor seed production and delivery systems.

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