

A MONTHLY PUBLICATION OF THE TROPICAL LEGUMES II PROJECT

About the Bulletin

The Bulletin of Tropical Legumes is a monthly publication of the Tropical Legumes II (TL II) project, funded by the Bill & Melinda Gates Foundation, and jointly implemented by the International Crops Research Institute in the Semi-Arid Tropics (ICRISAT), the International Center for Tropical Agriculture (CIAT) and the International Institute of Tropical Agriculture (IITA) in close collaboration with partners in the National Agricultural Research Systems of target countries in Sub-Saharan Africa and South Asia. TL II aims to improve the livelihoods of smallholder farmers in drought-prone areas of the two regions through enhanced grain legumes productivity and production.



Grain Legumes of India

Crops and trends

India grows at least a dozen species of grain legumes. Area planted to these crops¹ here is estimated at nearly 36 million ha and production at 29 million metric tons (Table 1). Chickpea, groundnut, and pigeonpea occupy the second, third and fourth largest area of all grain legumes in the country. One or more of these crops is grown in at least 22 of the 28 states and one union territory of India. The top five producers are Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh and Karnataka for chickpea; Gujarat, Andhra Pradesh, Karnataka, Tamil Nadu, and Maharashtra for groundnut; and Maharashtra, Karnataka, Andhra Pradesh, and Madhya Pradesh for pigeonpea (Figure 1).

These crops are largely grown by smallholder rural households where the average area planted

¹ Including groundnut and soybean, which are categorized under oil crops in India



Figure 1: Combined area coverage of chickpea, groundnut and pigeonpea in India.

Table 1: Status of major grain legumes of India

Name		Area (1000 Ha)	Percent of total area	Production (1000 MT)	Yield (Kg/Ha)
Common	Scientific				
Soybean	<i>Glycine max</i>	7,280	20.4	7,653	1,058
Chickpea	<i>Cicer arietinum</i>	6,897	19.3	5,597	811
Groundnut	<i>Arachis hypogaea</i>	6,457	18.1	7,630	1,188
Pigeonpea	<i>Cajanus cajan</i>	3,540	9.9	2,480	701
Mung bean	<i>Vigna radiata</i>	3,333	9.3	1,235	367
Urad	<i>Vigna mungo</i>	3,187	8.9	1,348	423
Moth bean	<i>Vigna aconitifolia</i>	1,483	4.1	409	266
Lentil	<i>Lens culinaris</i>	1,458	4.1	993	682
Peas & beans	<i>Pisum sativum</i> & others	764	2.1	740	970
Kulthi	<i>Macrotyloma uniflorum</i>	699	2.0	257	369
Lathyrus	<i>Lathyrus sativus</i>	659	1.8	381	573
Total/average		35,756	100.0	28,722	673

Source: Calculated from Ministry of Agriculture, Government of India database (2003-05 avg.)

<http://www.agricoop.nic.in/Agristatistics.htm>

per household is a little over 1 ha for chickpea and groundnut, and less than 1 ha for pigeonpea. Approximately 32%, 20%, and <5% of chickpea, groundnut, and pigeonpea area, respectively, is grown under irrigation². Yield and production also fluctuated (Figure 2) mainly because of fluctuations in the amount and distribution of the rainfall. The area planted to chickpea and groundnut heavily fluctuated over the years whereas pigeonpea area showed slow increments (Figure 2). For example, chickpea and pigeonpea area grew at 0.10% and 0.27% per year, respectively, during the period from 1985 to 2007 whereas groundnut area declined at the rate of 1.33% per year during the same period.

Yields of chickpea and groundnut grew at about 0.91% and 1.23% per year, respectively, whereas pigeonpea yield declined at 0.08% per year. Productions of chickpea and pigeonpea grew at about 0.96% and 0.19%, respectively, whereas groundnut yield declined at 0.13%.

In general, six out of 23 chickpea growing states and union territories showed positive growth for the period from 2001/02 to 2008/09; notable among these were Andhra Pradesh (14.7%), West Bengal (7.2%), Karnataka (5.2%) and Maharashtra (3.3%). On the other hand, 12 of those 23 states and territories showed negative growth. The declines were particularly heavy in Punjab (-12.7%), Haryana (-11.4%), Bihar (-6.3), Nagaland (-5.7%), and Himachal Pradesh (-5.3%). Ten each out of 24 groundnut producing states showed growths and declines in the area planted. Those showing high growths were Bihar (31.2%), Haryana (12.4%), West Bengal (11.4%), Goa (9.3%), and Orissa (5.2%).

Nagaland (-12.2%), Punjab (-6.5%), Puducherry (-6.4%), Tripura (-4.1%), and Chhattisgarh (-3.6%) were among the states that showed high declines in groundnut area. Only six of 24 states/territories showed positive growth in pigeonpea area; these were Nagaland (28.2%), Andhra Pradesh (4.1%), Tripura (3.7%), Karnataka (2.8%), Maharashtra (0.4%) and Assam (0.4%).

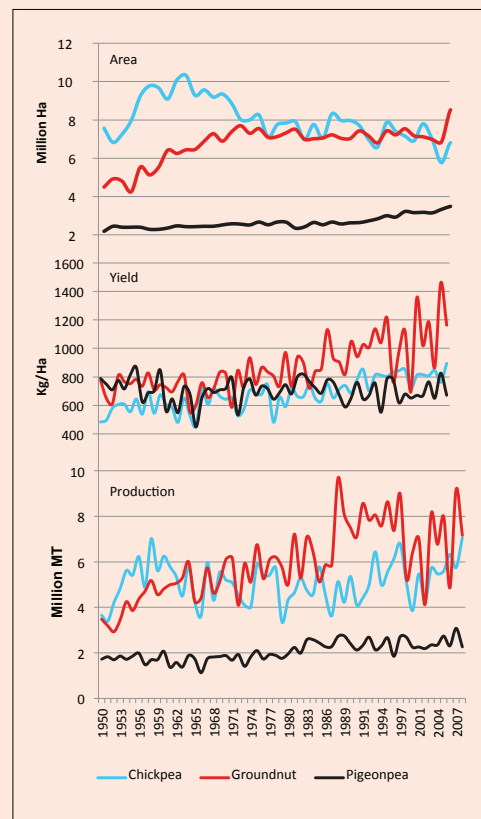


Figure 2: Chickpea, groundnut and pigeonpea trends in India, 1950/51-2009/10 (calculated from Ministry of Agriculture, Government of India database)

2 Averages for 2005-07 (calculated from Ministry of Agriculture, Government of India)

Examples where the area declined significantly include Tamil Nadu (-7.5%), Mizoram (-7.4%), Bihar (-5.9%), West Bengal (-5.1%) and Haryana (5.0%). The area for all of India grew by 0.1% per year for chickpea, showed no change for groundnut, and declined by 0.1% for pigeonpea; the growth for yield was 0.6% for chickpea, 6.2% for groundnut, and 0.5% for pigeonpea.

The fluctuations and declines in the grain legumes are in sharp contrast to cereals. For example, the area planted to wheat between 1961 and 1980 grew at the rate of 3.4%, contrasted with growth rates of -0.2%, -0.1%, and 0.4% for chickpea, groundnut, and pigeonpea, respectively; furthermore, wheat yield grew at 3.8% per year whereas those for chickpea, groundnut, and pigeonpea grew at 0.5%, 0.9%, and 0.5%, respectively, according to FAOSTAT. This is an indication of the lack of investment in grain legumes during the "Green Revolution" years of the 1970s. Perhaps that is why grain legumes have been referred to as "Orphan Crops".

The key constraints to grain legumes improvement in India include drought, *Fusarium* wilt, foliar diseases, pod borers, lack of awareness by farmers of improved technologies, lack of improved seed, and inadequate market access.

Projections

Projection data suggest that the national demand for chickpea, groundnut, pigeonpea, and soybean in India would all outstrip the supply both by 2010 and 2020 (Table 2). The total supply of the four crop commodities for 2010 is projected at approximately 28.4 million MT whereas the demand is 31.1 million MT. In a similar fashion, the supply in 2020 is estimated at approximately 30.4 million MT, in contrast with the demand of 33.7 million MT (Table 2). In other words, the supply and demand are projected to grow at the rate of 2.4% and 2.7% per year, respectively.

Table 2: Projected demand and supply (1000 MT) for major tropical legumes in India

Crop	2010		2020	
	Supply	Demand	Supply	Demand
Chickpea	8,376	9,153	9,172	10,031
Groundnut	7,963	8,649	8,338	9,192
Pigeonpea	3,571	3,947	3,801	4,301
Soybean	8,458	9,372	9,087	10,129
Total	28,368	31,121	30,398	33,653

Source: calculated from Bekele Shiferaw et al (unpublished data).

Trade

The 2005-07 FAOSTAT averages show that India is a net importer of peas, dry beans, and chickpea, and a net exporter of groundnut and soybean (Table 3). On balance, however, the country is a net importer of overall grain legume commodities. Annual imports are estimated at more than 2 million MT valued at US\$ 840 million. By contrast, the total annual export is estimated at 476,000 MT, worth US\$ 333 million (Table 3). Major import commodities include dry peas, beans, and chickpea whereas groundnut, lentil and soybean are the major exports. Projections also suggest that India would have more than 600,000 MT deficit net-trades for pigeonpea, groundnut, chickpea and soybean by 2015 and the figures would reach nearly 1.4 million MT by 2020.

Table 3: Grain legumes trade in India

Commodity	Import		Export	
	1000 MT	US\$ Millions	1000 MT	US\$ Millions
Peas	1,312	405	4	1
Beans	470	288	6	4
Chickpea	185	94	89	69
Lentils	109	54	134	73
Soybean	0	0	5	2
Groundnut	0	0	237	183
Total	2,076	840	476	333

Source: Calculated from FAOSTAT database (2005-07 avg.); data on pigeonpea trade are incomplete.

The future

TL II has been engaged in research and development of chickpea, groundnut and pigeonpea in India since its launching in September 2007. Intensive work involving participatory variety selection, seed systems development, introduction of new breeding lines, awareness creation, and capacity building has taken place during the first phase (2007-2011). Target areas were Prakasam and Kurnool districts of Andhra Pradesh and Dharwad and Gulbarga districts of Karnataka for chickpea; Bangalore, Dharwad and Raichur districts of Karnataka; and Erode, Namakkal, and Thiruvannamalai districts of Tamil Nadu for groundnut; and Ranga Reddy and Mahaboobnagar districts of Andhra Pradesh and Akola and Washim districts of Maharashtra for pigeonpea.

Six varieties of groundnut, two varieties of chickpea, and one hybrid of pigeonpea (first of its kind) have been released. A total of nearly 75,000 MT of seed has been produced and distributed to farmers. More than 56,000 farmers (22-30% women) have been exposed to new technologies. Institutional capacities have been strengthened through installation of new facilities and upgrading of existing ones, as well as short-term and degree training of national scientists.

Phase 2 shall leverage these gains to impact a wider number of smallholder farmers. Particular emphasis shall be placed on doubling the seed production and delivery efforts and including more women farmers. Two new states, Bihar and Orissa, shall be added in this phase to promote chickpea and groundnut. Research and development here would establish partnerships with scientists in the states and capitalize on the experiences gained from Andhra Pradesh, Karnataka and Tamil Nadu in Phase 1. Promotion of seed cleaning machines, use of special

containers (barrels) for seed storage, introduction of affordable mechanization, and helping the release of varieties in the pipeline are some of the important priority tasks. Varieties suited for irrigation (example, heat-tolerant chickpea and groundnut) need to be developed and promoted to address the growing demand for irrigated agriculture in India.

The Government of India provides incentives such as heavy subsidies for irrigation facilities and inputs such as seed and fertilizers; this is helping grain legume farmers to save on labour cost and expand their production. The increasing demands for grain legumes could open up increased market opportunities both for India and countries particularly in Eastern and Southern Africa because of their geographical proximity and existing trade linkages with that country. ■

*Tsedeke Abate
with contributions from NVPR Ganga Rao*

News and Events

TL II collaboration with sister projects

The Project Coordinator of TL II participated in the CIAT-TSBF workshop on Data Management and Knowledge Sharing held on 19–20 September, 2011, at Nairobi Safari Club Hotel. He made a presentation based on the experiences of TL II during its first phase

New partner appointed for Ethiopian common bean program

The common bean program in Ethiopia gets a new leader, Mr. Kidane Tumsa, replacing Dr Setegn Gebeyehu. Kidane obtained his BSc in Dryland Crop Science from Mekelle University, Ethiopia, in 2004 and his MSc in Plant Pathology/Breeding from Haramaya University, also Ethiopia, in 2008. He has been associated with the Ethiopian common bean program all his career. Kidane has assumed the new position as at August 2011. TL II sends a very warm welcome to Mr. Tumsa and wishes Dr Gebeyehu all the best in his new career.



Dr Setegn Gebeyehu



Mr. Kidane Tumsa