



Seed Production of Selected Crops in Telangana State, India: Assessment of Demand, Supply and Constraints

Pannala Divakar Reddy¹, Seema², R. Vijaya Kumari³, M. Sreenivasulu⁴, D. Srinivasa Chary⁵ and B. L. Manjunatha⁶

¹Department of Agricultural Economics, PJTSAU, Hyderabad, Telangana, India

²Dean of Agriculture, PJTSAU, Hyderabad, Telangana, India

³Deputy Director of Research, PJTSAU, Hyderabad, Telangana, India

⁴Professor, Department of Agricultural Extension, PJTSAU, Hyderabad, Telangana, India

⁵Associate Professor, Department of Statistics and Mathematics, PJTSAU, Hyderabad, Telangana, India

⁶Scientist (Agricultural Extension), ICAR-Central Arid Zone Research Institute, Jodhpur, Rajasthan, India

*Corresponding author email id: divakarreddy652@gmail.com

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ABSTRACT

The study estimated the gap in demand and supply of seed production in paddy, groundnut and soybean in Telangana state from 2012-13 to 2016-17. There was a surplus in paddy seed production (95 to 216%), which was exported to other states; inconsistency in groundnut seed production and deficit in few years was met through seed imported from Gujarat state; and deficit in soybean (13 to 80%) was met by imports from Madhya Pradesh. The constraints in seed production were assessed through primary data collected during 2017-18, using the multistage random sampling technique. Farmers reported that procurement price of seed (similar to crop prices) was not remunerative. Labour (human and machine) alone accounted for 30-38 per cent of the cost of seed production in soybean and groundnut. Coordination among public and private sector in seed production and distribution is required for addressing the demand and supply gaps.

INTRODUCTION

The seed production in India has quadrupled from 1991 to 2011 with a CAGR of 8 per cent per annum. The growth drivers were the rapid growth of innovations and seed markets, strengthening of IPRs and liberalized seed policies (Manjunatha et al., 2013). Indian seed industry with market size worth USD 2 billion is the fifth largest seed market in the world, accounting for 4.4 per cent of the global seed market after US (27%), China (20%), France (8%) and Brazil (6%) (Kumar et al., 2018). The Indian seeds market is further expected to grow at a CAGR of 14.3 per cent during 2018-2023, reaching a value of more than US\$ 8 Billion by 2023. Telangana state is endowed with favorable climatic conditions suitable for seed production of paddy varieties, pulses, oilseeds, hybrids of cotton, sorghum, maize, bajra, sunflower, fodder sorghum and vegetable crops. The farmers have become expert in seed

production of different crops over a period of four decades in the state. Telangana state is involved in production and supply of good quality seed to farmers all over India and also to other countries (Radha & Chowdary, 2002). Around 40 per cent of the hybrid seed marketed in the country is produced in Telangana and therefore can be developed as the 'Seed Bowl' of the country (DoA, 2018). Approximately 400 seed companies engaged in seed production are located in Telangana and is widely known as the seed capital of India. Both the public and private sectors have a huge network of certified seed production through contractual arrangements with progressive seed farmers (Janaiah & Debdutt, 2017). In this context, the present study was aimed at estimating the demand and supply gap in certified/ quality seed production of selected crops in Telangana state and to assess the constraints faced by the seed producing farmers.

METHODOLOGY

The primary data was collected from 300 seed producing farm households from January 2017 to December 2018 through personal interview method assisted by the well-designed pretested interview schedule. Multistage sampling technique was adopted for selection of the sample with Divisions (cluster of districts) at the first stage, Mandals (sub division/ block) at the second stage, villages at the third stage and respondents at the final stage. Paddy seed growers were selected from Karimnagar and Warangal districts; groundnut seed producers from Mahabubnagar district; and soybean seed producers from Adilabad and Nizamabad districts. Henry Garrett Ranking technique was used to prioritize and rank the constraints faced by the seed producing farmers.

The reference period for estimation of demand and supply was from 2012-13 to 2016-17. The demand of quality seed requirement was estimated by using area multiplied by seed rate and Seed Replacement Ratio (Kumar et al., 2018). The data on seed replacement ratio, seed rate, acreage, seed multiplication ratio, certified seed production was collected personally by the researchers from various agencies like Telangana State Seed & Organic Certification Authority (TSSOCA), Telangana State Seeds Development Corporation Ltd. (TSSDC) and Department of Agriculture, Government of Telangana. Secondary data was also collected from reports of various organizations (DoA, 2022; Professor Jayashankar Telangana State Agricultural University (Annual Reports, 2010-16), National Seeds Corporation Ltd. (NSC), All India Coordinated Research Projects (AICRPs) and Private companies. The demand of certified seed was calculated and compared with the actual/available quantities.

RESULTS AND DISCUSSION

The results are discussed under two sections: demand and supply gap in seed production in Telangana state and constraints faced by the farmers in seed production.

Demand and supply gap

The demand and supply of quality/ certified seed of paddy, groundnut and soybean in Telangana state is as in Table 1. The supply of paddy seed in the state increased from 1,48,773.7 tons in 2012-13 to 1,96,363.8 tons in 2016-17. There was a decline in seed supply during 2014-15 and 2015-16 because of decline in area under the crop and consequent decline in demand. The demand for certified seed increased from 70,900 tons during 2012-13 to 1,00,450 tons during 2013-14. There was wide variation in the demand of paddy seed over the years but the supply was always

higher than demand. The surplus seed production ranged from 94.7 per cent during 2013-14 to 215.8 per cent in 2015-16.

In Telangana state, total area registered under seed production during 2017-18 was 179.18 thousand acres with certified seed production of 1,69,073.2 tons. Paddy seed production was undertaken in 109.1 thousand acres (47.75% of the registered area under seed production) with production of 1,71,107 tons during 2016-2017 (TSSOCA, 2017-18). The paddy seed production was undertaken in Karimnagar and Warangal districts and the major varieties were RNR-15048, MTU-1010, MTU-1061, KNM-118, JGL-18047 and BPT-5204. The surplus paddy seed production was exported to Andhra Pradesh, Tamil Nadu, Uttar Pradesh, Rajasthan, Karnataka, Chhattisgarh and Odisha. Two-thirds of India's total certified seed production of modern rice varieties were undertaken in Telangana and Andhra Pradesh. The most popular modern varieties of rice such as Swarna, BPT 5204, Vijetha, Cotton Dora, etc., which were developed and released by the local SAUs, are widely grown in different states of India (Janaiah & Debdutt, 2017).

The supply of groundnut seed from 2012-13 to 2016-17 has declined except during 2015-16. The demand for groundnut seed did not indicate any particular pattern. During 2012-13 and 2015-16, there was surplus in seed supply to the extent of 21 per cent and 96 per cent respectively. For the rest of the years, there was a deficit to the tune of 19 per cent to 66 per cent. Area under groundnut seed production was 18.77 thousand acres (8.21% of the registered area under seed production) with production of 8606.4 tons certified seed during 2016-17 (TSSOCA, 2017-18). The groundnut seed production was undertaken in Mahabubnagar district. The major growing varieties i.e., Kadiri-6 and Kadiri Lepakshi-1812 were imported from Andhra Pradesh (TSSOCA, 2018). The decline in supply was the result of changing cropping pattern and inconsistent rainfall during the last few years of the study period. The deficit in seed requirement in the state was met through imports from Gujarat state. The continuous fall in the prices of groundnut is also resulting in decrease in the area under the crop and decreased demand for the seed when compared to previous years (TSSOCA, 2018). The seed supply in the state increased from 7975.3 tons in 2012-13 to 15,789.9 tons in 2015-16 with wide fluctuations over the years. The demand increased consistently from 2012-13 to 2016-17. There was deficit in seed supply to the extent of 13 per cent to 80 per cent throughout the period.

The area under soybean seed production was 64.73 thousand acres (28.33% of the registered area under seed production) with certified seed production of 7493.8 tons during 2016-17 (TSSOCA, 2018). The soybean seed production was undertaken in Adilabad and Nizamabad districts. The major varieties were JS-335 and ADB-

Table 1. Demand and supply gap in quality seed production in Telangana State (in tons)

Year	Paddy			Groundnut			Soybean		
	Supply	Demand	Surplus/ Deficit	Supply	Demand	Surplus/ Deficit	Supply	Demand	Surplus/ Deficit
2012-13	148773.7	70900	77873.7 (109.8)	33958.4	28050	5908.4 (21.1)	7975.3	11850	-3874.7 (-32.7)
2013-14	195622.5	100450	95172.5 (94.7)	23113.0	31500	-8387.0 (-26.6)	3550.6	18150	-1,4599.4 (-80.4)
2014-15	165768.1	70750	95018.1 (134.3)	18737.2	23250	-4512.8 (-19.4)	5693.1	18225	-12531.9 (-68.8)
2015-16	158081.8	50050	108031.8 (215.8)	35193.8	18000	17193.8 (95.5)	15789.9	18225	-2435.1 (-13.4)
2016-17	196363.8	91400	104963.8 (114.8)	8606.4	25050	-16443.6 (-65.6)	7200.0	20775	-13575.0 (-65.3)

Note: (1) Figures in the parentheses are percentage to the total. (2) Quality seed includes "Certified seed" and Truthfully Labelled Seed".

22. The area under soybean has been consistently increasing and the supply was not able to match with the increased demand leading to the deficit. The seeds were imported from Madhya Pradesh state since enough seed was not produced due to unfavourable weather and lack of sufficient breeder/foundation seed in the state. Therefore, there is a good scope to expand the area under soybean seed production in the state. The area under soybean crop cultivation is witnessing a steady growth and newer districts are also looking at the area expansion.

Constraints faced by the farmers in seed production

The experiences of seed producing farmers with special reference to these three crops were explored (Table 2). The major issue among all seed producing farmers was the lack of remunerative prices for seed. Seed production involves higher cost over crop production and is also prone to higher risks (possibility of rejection of seed lots in case of not confirming to standards). Therefore, farmers demanded a remunerative procurement prices for seed from public and private sector seed agencies. The payment made by the private and public agencies to the seed growers is unduly delayed and released in installments. Further, whenever there is a crop loss, there is undue delay in releasing compensation to the farmers. Though the procurement price of seed is more than normal grain production, the delay in payment will negate the additional profits. Study conducted in Terai Zone of West Bengal reported that pest and diseases management and low price of output were the major constraints of mustard seed production (Layek et al., 2021).

It was reported that soybean seed production in Nizamabad and Adilabad districts in Telangana state during 2016-17 yielded average return of Rs. 98,760/ha with returns of 2.32 per rupee spent. Machine labour and human labour accounted for 16 per cent and 15 per cent of the total cost of cultivation, respectively. The groundnut seed production in Mahabubnagar district yielded average returns of Rs. 1,26,720/ha with returns of 1.46 per rupee spent. Human and machine labour accounted for 22 per cent and 16 per cent, respectively (Reddy et al., 2019a; Reddy et al., 2019b). The major costs in mustard seed production in Terai Zone of West Bengal were human labour charges, organic manure and machinery charges accounting 37 per cent, 16 per cent and 14 per cent of the total variable cost, respectively (Layek et al., 2021). Since agricultural labourers are migrating to cities in search of alternate and regular employment, farmers are finding it difficult to get skilled labour at affordable prices. The social interdependence among and between the farmers and farm labourers has declined in

rural areas over a period of time. The soybean is a relatively new crop to the region and seed producers from Nizamabad division felt that a more detailed technical knowledge is needed to bring in quality seed production.

Seed certification in India is undertaken only for notified varieties and is optional. Private seed companies generally undertake production of Truthfully Labeled Seed to avoid time consuming and costly certification procedure (Manjunatha et al., 2016). Government agencies like TSSDCL organize seed production through registered contract farmers with certification from TSSOCA. Limited staff with TSSOCA has affected regular visits to seed plots and delayed seed certification.

Discussion with officers of TSSDCL, TSSOCA and department of agriculture revealed that some private companies procure the breeder seed in large quantities and multiply directly as certified seed instead of channelizing it through foundation seed. This has created the situation of short supply of foundation seed to the seed growers. The shortage of foundation seed will consequently lead to shortages in certified seed. The poor maintenance of purity of breeder and foundation seed was reported by some farmers especially in paddy. Some farmers undertook seed production of paddy on their own every year. They reported that the portion of their seed stock was unsold every year even though the quality of their seeds was best and preferred among the fellow farmers. Seed is a perishable commodity and lack of proper storage facilities with farmers resulted in reduction in quality of seed.

Study conducted in undivided Andhra Pradesh and Bihar states reported that protecting and upholding farmers' rights over seed without any legal hindrances was the most important issue for farmers. Farmers' rights over seed were implicit for all the farmers, irrespective of their awareness and knowledge on laws that protect and uphold these rights, such as PPVFRA, 2001 (Manjunatha et al., 2016). The increase in seed replacement ratio in itself is not an indicator of use of quality seed and high crop productivity. There are risks associated with purchasing new seeds every year from market under weak quality control regime such as crop failure on account of spurious seeds (Manjunatha et al., 2015a). The farmers' practice of using higher seed rate than recommended, resowing for 2-3 times in rainfed conditions and complete dependence on market has led to increased expenditure on seed (Manjunatha et al., 2018). The regulation of retail price and trait/royalty fee of seed is scientific under monopoly market conditions for proprietary technologies involving royalty component (Manjunatha et al., 2015b). Study undertaken in western Rajasthan reported that Quality Seed

Table 2. Constraints in seed production in Telangana state

S.No.	Item	Mean Score	Rank
1	Less remunerative procurement price for seed	82.00	I
2	Non-availability of skilled labour	76.93	II
3	Lack of seed production skills in case of new crops	65.67	III
4	Delayed payment and compensation in case of crop loss	57.33	IV
5	Lengthy seed certification procedure	56.47	V
6	Non-availability of foundation seed of required variety	51.33	VI
7	Poor quality of foundation seed	48.60	VII
8	Lack of systematic and scientific demand assessment	42.20	VIII
9	Unsold seed stock	35.13	IX
10	Lack of scientific storage facilities with farmers	31.40	X

Accessibility Index was highest for farm saved seeds (carrot, onion and garlic) indicating that the seeds/planting material in these crops were easily and timely available, affordable, credible and performed as expected without any cases of spurious seeds. In case of seeds purchased from market, timely availability was not an issue but the seeds of desired variety were not always available (Manjunatha et al., 2018). The farmers were found to have excellent seed production skills in carrot, onion and garlic as evident from high quality of seed/planting material in these crops though the seed replacement ratio was very low (Hajong et al., 2019). Participatory plant breeding (PPB) helps in developing varieties suitable to local environments. Study in Punjab reported that all the farmers and only 40 per cent of the breeders showed willingness to participate in a PPB programme (Faisal et al., 2020).

CONCLUSION

Due to huge market, and high revenues both the formal (public and private) and informal (farmers and civil society organizations) sector were involved in seed production of paddy. Therefore the seed supply in paddy was always higher than the demand. Groundnut and soybean seed production is not preferred by the private seed companies since these are “high-volume and low-value” crops. Therefore, government agencies may focus on fulfilling the seed requirement of these crops. Seed production, like agriculture as a whole, has become less remunerative due to increase in cost of cultivation and impact of climate change. Therefore, it is recommended that procurement price of seed must be at least 150 per cent of the cost of cultivation.

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