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Ensure Better Harvest and Better Income and Distribution Efficiency of Seedminikit in Madhya Pradesh

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Abstract

The Government is implementing seed minikit programme under various schemes of the Ministry of Agriculture. Seed minikits of different field and fodder crops are given to farmers including those belonging to below poverty line in order to introduce new varieties/hybrids and to encourage farmers for seed multiplication of various crops at grass root level. All the major pulses viz. chickpea (*Cicer arietinum*), lentil (*Lens culinaris*) and black gram (*Vigna mungo*) were taken in to consideration for the study on the basis of the distribution of seed minikits of pulses to the pulses growers. A district under rain fed and a district under irrigated condition were selected for the study on the basis of maximum area under the districts and number of seed minikits of pulses distributed by state agriculture department. Hence, Datia and Sagar districts were selected under rain fed and irrigated condition respectively. The 200 minikits were found to be distributed among respondents of different size of farms during the year 2017 and 2018. Among the different types of pulses 68.5, 10.0 and 21.5 per cent of seed minikits of pulses were found to be chickpea, lentil and black gram. On an average the cost of cultivation of chickpea, lentil and black gram was found to be reduced by 23.67, 0.95 and 12.89 per cent while net return was found to be increased by 40.01, 5.55 and 71.53 per cent after availing seed minikit facility by the beneficiary as compared to non-beneficiary. The 31.02, 49.71 and 51.89 per cent output was found to be used as seed for next year out of 2.45, 1.71 and 2.12 q/HH seed produced was used by the chickpea, lentil and black gram growers respectively for the cultivation of crops.

Key Words : *Seed minikit, Pulses, Nutritional Crops and Profitability.*

Introduction

The pulses are normally grown in all the ecological situation of India i.e. from J&K to Kerala. Performance of pulses at two important point i.e. the area occupied and contribution in production is better in Central India as compared to other parts of the country. The Government is implementing seed minikit programme under various schemes of the Ministry of Agriculture. Seed minikits of different field and fodder crops were given to farmers including those belonging to below poverty line in order to introduce new varieties/hybrids and to encourage farmers for seed multiplication of various crops at grass root level. The seed minikits of oilseeds and maize are provided under Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM). National Food Security Mission (NFSM) provides seed minikits of rice, wheat and pulses in identified districts of the country. Macro Management of Agriculture (MMA) and Rashtriya Krishi Vikas Yojana (RKVY) also provide support for crop development, including supply of seed minikits as per priorities of the States in their work plan (Anonymous). The beneficiaries are requested to make necessary arrangements for conducting demonstrations at suitable locations ensuring that 25 per cent of these demonstrations are conducted on the fields belonging to scheduled castes and scheduled tribes' farmers. The women farmers also encouraged as beneficiaries for allotment of minikits to them. The potential of pulses help to address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016 International Year of Pulses. Pulses are grown in all three seasons. The three crop seasons for the commodity are: i. Kharif – Arhar (Tur), Urd (Blackgram), Moong (Greengram), Lobia (Cowpea), Kulthi (Horsegram) and Moth; ii. Rabi – Gram, Lentil, Pea, Lathyrus and Rajmash iii. Summer – Greengram, Blackgram and Cowpea Pulses in India Retrospect & Prospects.

Improper sowing time, low seed rate, defective sowing method, insufficient irrigation, inadequate intercultural operations, sowing without proper management are major agronomic constraints (Ramakrishna *et al*., 2000 and Reddy, 2009) in cultivation of chickpea. Subsequently plants get comparatively less time to complete their lifecycle which, by and large forces maturity (Ramakrishna et al., 2000). Typically, late sown rabi pulses especially lentil and chick pea undergoes three distinct phases and considerable degrees of phenological modifications are bound to happen. This poses serious threat to realization of yield potential due to cold injuries. This phase is very important for creating source of channelizing the energy at later stage. In the last and most important phase lentil faces heat injury,

resulting in early onset of reproductive phase, causing imbalance in resources and inputs, biotic stress and forced maturity (Joshi, 1998; Dixit *et al*. 2009; Reid *et al*., 2011 and Singh and Bhatt, 2013). An earlier study revealed that area under pulses is mostly predetermined, but as the irrigated area increases, pulses are relocated to rainfed areas and their area is replaced by cereals or some cash crop (Singh *et al*., 1995). In India, the irrigated area under pulses was only 12 per cent, while under wheat and paddy; it was more than 60 per cent of the total area (Reddy and Reddy, 2010). Poor soil and agro-climatic conditions not only compel late sowing of legumes, leads to reduced length of growing period but also necessitate to sustain cold injuries at early vegetative phase which freeze all biological activities for prolonged period. A sudden rise in temperature, not only induces forced maturity but simultaneously invites several biotic stress viz., diseases and insects pests (Ali *et al*., 2012; Reddy, 2009 and Singh and Singh, 2008). Traditionally rabi pulses sowing were delayed up to last week of November and some times under extreme circumstances it goes up to the first fortnight of December, obviously due to reasons already explained (Singh *et al.,* 2011 and Ramakrishna *et al*., 2000). Keeping to the above facts in mind the present study has been formulated with the profitability and distribution of quality seed of pulse seed minikits among the farmers community.

Materials and Methods

The study confined to a prominent pulses growing State of India viz. Madhya Pradesh. All the major pulses viz. chickpea (*Cicer arietinum*), lentil (*Lens culinaris*) and black gram (*Vigna mungo*) were taken into consideration for the study on the basis of the distribution of seed minikits of pulses to the pulses growers. A district under rain fed and a district under irrigated condition were selected for the study having maximum area under the districts and number of seed minikits of pulses distributed by state agriculture department. Hence, Datia and Sagar districts were selected under rain fed and irrigated condition respectively, in Madhya Pradesh. A list of seed minikits of pulses distributed to the respondents in the various villages and blocks of the selected districts was prepared and top 100 beneficiaries from each district have been selected for the study. 50 controls (non-beneficiaries) were considered of the same village for the study to draw relevant results.

Analysis of the Data : The following statistics tools were used for the study

(a) Mean : The average of the variables used for the study.

$$\text{Mean} \qquad \bar{X} = \frac{x}{n}$$

Where,

X = Mean of the variables

x = Sum of scores (observation) of variables

n = Total number of respondents

(a) Gross Return (Rs/acre) = Value of main product + Value of the by-product

(b) Net Return (Rs/acre) = Gross Return- Total Cost of Cultivation

(c) Cost of Cultivation (Rs/acre) = Total Material Cost and Total Labour Cost

(d) Cost of Production (Q/acre) = Total cost of Cultivation (Rs/acre) /yield (q/acre)

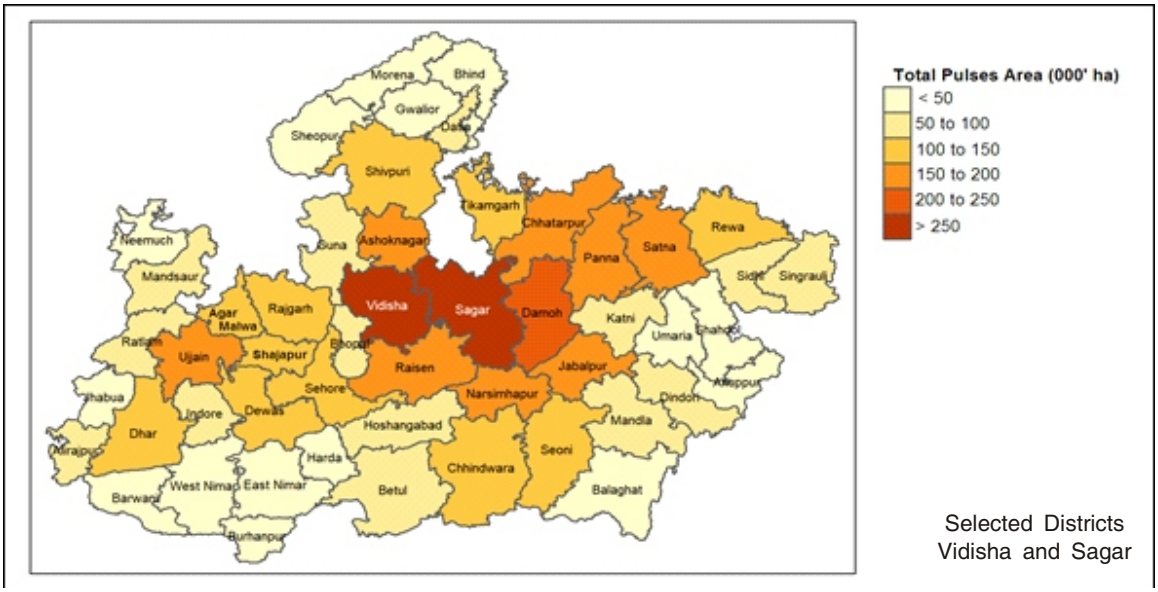

Fig.-1 : Intensity of total pulses area across districts of Madhya Pradesh.

Results and Discussion

Distribution, purchased seed, net return from major pulses, share of cost of pulses crops, productivity and disposal of produce were observed for the study.

Distribution of Seed Minikits : The 200 minikits were found to be distributed amongst respondents of different size of farms during the year 2017 and 2018. The maximum seed minikits (85.5%) were found to be distributed during the year 2018 as compared to the year 2017 (14.5%) (Fig.-2).

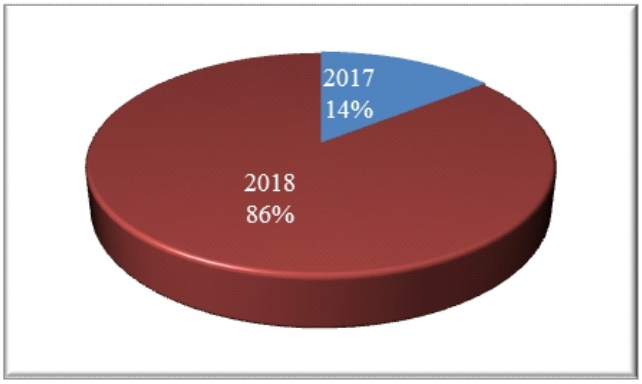

Fig.-2 : Number of seed minikit distributed.

Purchased Seed from Seed Minikits : Amongst the different types of pulses 68.5, 10.0 and 21.5 per cent of seed minikits of pulses were found to be of chickpea (*Cicer arietinum*), lentil (*Lens culinaris*) and black gram (*Vigna mungo*), respectively, in which total transportation cost incurred was found to be Rs. 1.27 (chickpea), 2.55 (lentil) & 4.91 (black gram) per kg in transportation of seed from Agriculture office to their farm in the area under study. An average respondent was found to cover approximate 12 km. distance to avail the facilities (Table-1).

Net Return from Major Pulses : The productivity and net return obtained from various pulses viz. chickpea, lentil and black gram by cultivators in seed minikit (beneficiaries) and without seed minikit (non-beneficiaries) in presented table-2. It is observed from the data that on an average the cost of cultivation of chickpea was found to be reduced by 23.67 per cent from Rs. 5489 to Rs. 4190 per acre of an average beneficiaries farm as compared to non-beneficiaries farm. The net return was found to be increased by 40.01 per cent from Rs. 17381 to Rs. 12414 per acre after availing seed minikit facility by the beneficiary as compared to non-beneficiary. The net price received by an average beneficiary was also found to be increased by 2.0 per cent from Rs. 4455 to Rs. 4366 per quintal as compared to non-beneficiary (Table-2).

The cost of cultivation of lentil was also found to be decreased by 0.95 per cent from Rs. 4321 to Rs. 4280 per acre in case of an average beneficiaries farm as compared to non-beneficiar ies farm, while the net return was found to be increased by 19.61 per cent from Rs. 15203 to Rs. 12711 per acre. The net price received was found to be increased by 5.55 per cent from Rs. 3947 to Rs. 4166 per quintal. The cost of cultivation of black gram was found to be decreased by 12.89 per cent from Rs. 2537 to Rs. 2210 per acre on an average beneficiaries farm as compare to non-beneficiaries farm, while the net return was found to be increased by 71.53 per cent from Rs. 8982 to Rs.15407 per acre after availing seed minikit facilities by an average beneficiary farmer as compare to non-beneficiary farmer. The net price obtained by an average beneficiary farmer was also found to be 8.68 per cent increased from Rs. 3444 to Rs. 3743 per quintal as compared to non-beneficiary farmer.

Share of Cost of Pulses Crops : Percentage share of different operations in cost of cultivation of pulses production related to chickpea, lentil and black gram was observed and presented in table 3. It is observed from the data that out of total cost incurred in cultivation of chickpea the maximum cost was found to be incurred in the field preparation (25.14%) followed by fertilizer and its application (17.77), harvesting and threshing (13.97%), farm yard manure (13.52%), seed and sowing (11.35%), bagging & transportation (6.60%), weeding (5.98%), irrigation (4.57%) and plant protection measure (1.11%).

In total cost of cultivation of lentil, the maximum cost was found to be incurred in the field preparation (20.64%) followed by harvesting & threshing (20.32%), seed/sowing (15.77%), irrigation (9.08%), plant protection (8.09%), farm yard manure, (7.85%), and bagging & transportation (7.76%) fertilizers (5.7%) and weeding (4.79%). In total cost of cultivation of black gram the maximum cost was found to be incurred in the field preparation (19.79%) followed by harvesting & threshing (18.4%), seed/sowing (14.21%), farm yard manure (11.68%), fertilizers (10.58%), weeding (8.23%), plant protection (7.03%), bagging & transportation (6.68%) and irrigation (3.4%).

Productivity : The details of seed minikit provided for production of pulses is given in table 4. It is observed form the table that 16, 8 and 4 Kg. seed of chickpea, lentil and black gram, respectively were found to be provided to cultivate 0.5 acres area under seed minikit programme during 2018-19 in the area under study.

The 31.02, 49.71 and 51.89 per cent of chickpea, lentil and black gram seed out of 2.45, 1.71 and 2.12 q/HH seed produced was used by the chickpea, lentil and black gram growers respectively in the next year for the cultivation of crops.

Disposal of Produce : The most prominent channel followed by the beneficiaries for disposal of chickpea

Table-1 : Seed purchased by the farmer under Seed Minikits programme.

Crop	Quantity (kgs)	Price (Rs/ kg)	Source purchased From RSK/DAFW (%)	Distance from Farm (kms)	Transportation Cost (Rs/kg)
Chickpea	16	0	68.5	12	1.27
Lentil	8	0	10	11	2.55
Black Gram	4	0	21.5	12	4.91

Note : RSK: Raitha Samparka Kendra & DAFW-Department of Agriculture and Farmers welfare.

Table-2 : Profitability analysis of major pulses with and without Seed Minikits.

Farm Size	Average Area under pulses (acres/HHs)		Value of Output (Rs/acre)		Cost of Cultivation (Rs/ acre.)		Net Returns (Rs/acre)		Net price obtained (Rs/quintal)	
	SMK	Without SMK	SMK	Without SMK	SMK	Without SMK	SMK	Without SMK	SMK	Without SMK
Chickpea	1.24	1.43	21571 (20.49)	17902	4190 (-23.67)	5489	17381 (40.01)	12414	4455 (2.04)	4366
Lentil	0.21	0.39	19483 (14.39)	17032	4280 (-0.95)	4321	15203 (19.61)	12711	4166 (5.55)	3947
Black gram	1.27	1.46	17617 (52.94)	11519	2210 (-12.89)	2537	15407 (71.53)	8982	3743 (8.68)	3444

Table-3 : Contribution of operational cost in different practices of cultivation (%).

Particulars	Chickpea	Lentil	Black Gram
Field Preparation	25.14	20.64	19.79
Seed/Sowing	11.35	15.77	14.21
Farm Yard Manure	13.52	7.85	11.68
Irrigation	4.57	9.08	3.4
Fertilizers	17.77	5.7	10.58
Plant Protection	1.11	8.09	8.23
Weeding	5.98	4.79	7.03
Harvesting & Threshing	13.97	20.32	18.4
Bagging & Transportation	6.60	7.76	6.68
Total	100	100	100

Table-4: Details of Seed Minikit provided for different pulses.

Particulars	Quantity (kgs/hh)	Area Acres	Output Produced from Seed Minikits (q/HH)	Output Used as Seed (q/HH)
Chickpea	16	0.5	2.45	0.76 (31.02)
Lentil	8	0.5	1.71	0.85 (49.71)
Black gram	4	0.5	2.12	1.1 (51.89)

produce under seed minikit of pulses programme was found to be village farmers (52.55%). They were also found to dispose off their 34.31 and 13.14 percent of chickpea produce obtained under seed minikit of pulses programme to hat market and APMC respectively (Fig.-3).

In case of lentil it was found that the maximum quantity of lentil disposed off through village farmers (50%) followed by village traders (30%), hat market (10%) and APMC (10%), while in case of black gram the highest quantity was found to be disposed off through APMC (37.21%) followed by village farmers (30.23%), hat market (30.23%) and village traders (2.33%) There was no remarkable difference was found in different size of respondents. Although, large size of respondents were found to sell 100 per cent production of lentil in APMC, these findings were found to be similar across all size of respondents.

Conclusions and Policy Implication

Seed is considered to be the major input, while cultivation of crops therefore before distribution of seed minikits, result demonstrations are required to be laid down on the farmers field to transfer the technology in totality and major inputs other than seed should be clubbed and distributed among farming communities with seed minikits to generate real impact of the technology. As of now, there is no mechanism for collection of seed produced through seed minikits by govt agencies and its distributions among non-beneficiaries farming community at affordable prices, with the result of it farmers are bound/forced to sell it in the local/APMC markets as grain instead of seed in the absence of proper supply/ value chain for the marketing of the seed causing reduced income. This not only leads to wastage of precious input on the one hand and without its

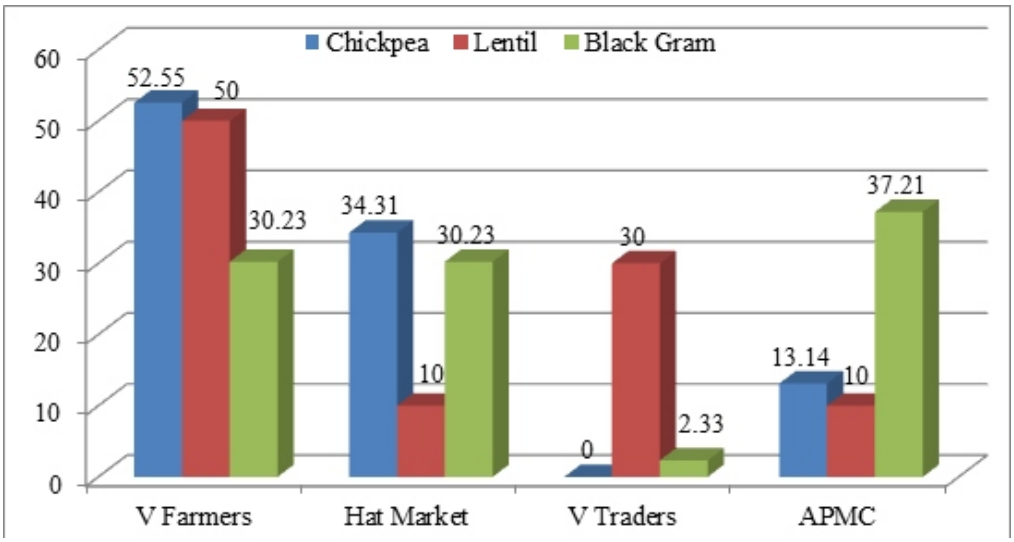

Fig.-3 : Marketing channels through which pulses sold by the selected households (% of output).

distribution it slow down the pace of penetration (horizontal/vertical) of the improved technology among farming community on time and thereby increasing the time-leg for adoption of technology on the other incurring loss to the farming community in both ways. Sometimes the technology become old and looses its identity before its proper maturity due to introduction of new technology in the absence of proper mechanism.

References

1. Ali M and Gupta S. (2012). Carrying capacity of Indian agriculture: Pulse crops *Cur. Sci.* 102 (6): 874-81.
2. Ali RI, Awan TH, Ahmad MM, Saleem U and Akhtar M. (2012). Diversification of Rice-Based Cropping Systems to Improve Soil fertility, Sustainable Productivity and Economics. *J. Animal & Plant Sciences* 22 (1): 108-12.
3. Anonymous - (https://www.indiainfoline.com/article/news-top-story/seed-mini-kit-programme-to-introduce-new-varieties-1131022031 07_1.html).
4. Dixit GP, Katiyar PK, Singh BB and Shivkumar (2009) Lentil varieties in India. AICRP on MULLaRP. Indian Institute of Pulses Research, Kanpur.
5. Nethrayini, KR. and Mundinamani, SM. (2013). Impact of technology mission on oilseeds and pulses on pulse production in Karnataka. Internat. Res. J. agric. Eco. & Stat., 4 (2) : 148-153.
6. Ramakrishna A, Gowda CLL and Johansen C. (2000). Management factors affecting legumes production in the Indo-Gangetic Plain. In: Legumes in rice and wheat cropping systems of the Indo-Gangetic Plain-constraints and opportunities. (Johansen C, Duxbury JM, Virmani SM, Gowda CLL. Eds.). pp. 156-165. ICRISAT, Patancheru, Andhra Pradesh.
7. Reddy AA and Reddy GP. (2010). Supply Side Constrains in Production of Pulses in India: A Case Study of Lentil. *Agricultural Economics Research Revie*. Vol. 23 January-June 2010 pp 129-136.
8. Reddy AA. (2009) Pulses Production Technology: Status and Way Forward. *Economic & Political Weekly* 44 (52): 73-80.
9. Reid DE, Ferguson BJ, Hayashi S, Lin YH and Gresshoff PM. (2011) Molecular mechanisms controlling legume autoregulation of nodulation. *Annals of Botany* 108: 789-95.
10. Singh AK and Bhatt BP. (2013). Effects of foliar application of zinc on growth and seed yield of late-sown lentil. *Indian J. Agril. Sci.* 83 (6): 622-6.
11. Singh AK and Singh NP. (2008). Yield and uptake of primary nutrients by large seeded varieties of lentil under varying seed rates in normal and late sown conditions. *Journal of Food Legumes* 20 (2): 187-9.
12. Singh AK, Bhatt BP, Singh KM, Kumar Abhay, Manibhushan, Kumar Ujjawal, Chandra Naresh and Bharati RC (2013b) Dynamics of powdery mildew (Erysiphetrifolii) disease of lentil influenced by sulphur and zinc nutrition. *Plant Pathology Journal* 12(2): 71-7.
13. Singh AK, Bhatt BP, Sundaram PK, Gupta AK and Singh Deepak (2013c) Planting geometry to optimize growth and productivity faba bean (*Viciafaba* L.) and soil fertility. J. Environ. Biol. 34 (1): 117-22.
14. Singh *et, al*. (2015). Pulses Production in India: Present Status, Bottleneck and Way Forward. *Journal of Agrisearch* 2 (2): 75-83.