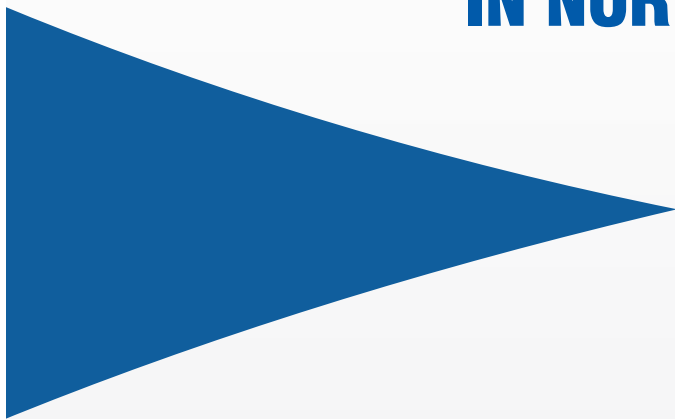


PERFORMANCE OF PULSES IN NORTH-WEST INDIA



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**ICAR-Agricultural Technology Application Research Institute
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Copies : 150

Pages : 68

Printed at : Printing Service Co.
3801/1, Model Town, Ludhiana
0161-2410896, 09888021624 (Cell)



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भा.कृ.अनु.प.-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान
क्षेत्र-१, पं.कृ.वि. परिसर, लुधियाना - १४१००४

ICAR-Agricultural Technology Application Research Institute
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Preface

Adequate food is a basic human right but millions of people sleep hungry stomach. India, even after being an agricultural country, lacks food security i.e. social and economic access to safe and nutritious food at all times to all people to meet not only the dietary needs but also the food preference for leading an active and healthy life. India is self-sufficient in production of cereals to meet energy requirement of its citizens; but, has to import pulses to meet the protein requirement. Globally, India is the largest producer, consumer and also the largest importer of the pulses. India's population is expected to touch 1.68 billion by 2030 and considering improving standards of living and rising per capita income, pulses requirement for the year 2030 is likely to reach 32 million ton. Pulses are the major source of dietary protein in Indian diet, as majority of the population is vegetarian. The importance of pulses in India cannot be undermined as it is the second most important constituent of Indian diet after cereals. Pulses can be grown on all types of soils and climatic conditions and they provide ready cash to the farmers. They are important in maintaining soil fertility, thus are integral part of crop rotations and mixed and intercropping systems. Pulses based cropping systems are known to boost the soil fertility, crop productivity, sustainability and could be helpful in doubling farmer's income which is a dream of the present government.

On the contrary; better irrigation facilities, availability of inputs like fertilizers etc., during and post green revolution era, have led to specialized farming (e.g. wheat and rice) resulting in decline of area under pulse cultivation. This has aggravated the problems of mismatch between demand and supply of pulses leading into rising food inflation. Consequently; Government of India started importing pulses for meeting domestic demand, which has costed a lot of Indian currency to the exchequer. Dealing with this issue has no better solution than increasing the area under pulses cultivation,



accelerating the productivity and domestic production of pulses and thereby achieving self-sufficiency. Thus; to reach the target of self-sufficiency in pulses production, Department of Agriculture, Cooperation and Farmers Welfare (DAC&FW) has collaborated with Indian Council of Agricultural Research (ICAR) to implement the project titled “Cluster Frontline Demonstrations on Pulses” through *Krishi Vigyan Kendras* (KVK) during 2015-16 for increasing the production through spread of improved production technologies generated by SAUs and ICAR institutes among the farmers. The project was continued during year 2016-17 and it was successfully implemented by the KVKs achieving newer milestones.

I would like to extend my sincere thanks to the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) for providing funds for this project under National Food Security Mission (NFSM). I thank Dr. T. Mohapatra, Secretary, DARE and DG, ICAR for his dynamic leadership and worthy guidance to the institute in performing its duties. I am grateful to Dr. A.K. Singh, DDG (Division of Agricultural Extension) and Dr. V.P. Chahal, ADG (Agricultural Extension) for their constant encouragement and diligent support in implementing the project. I would also like to thank the Programme Coordinators of KVKs and farmers for successful implementation of the project. I also appreciate all the Vice-Chancellors and Directors of Extension Education from the State Agricultural Universities of Zone-1 for their valuable support and cooperation.

I am especially thankful to the project team at ICAR-ATARI, Ludhiana and other colleagues of the institute who enthusiastically participated and successfully implemented the project.

(Rajbir Singh)



कार्यकारी सारांश

दालों की बढ़ती कीमतें और बढ़ते आयात के कारण भारत सरकार ने देश को दाल उत्पादन में आत्मनिर्भर बनाने के लिए विशेष कदम उठाए हैं। घरेलू उत्पादन को बढ़ावा देने के लिए, वर्ष 2015 में, कृषि और किसान कल्याण मंत्रालय के कृषि, सहकारिता एवं किसान कल्याण (DAC&FW) विभाग द्वारा “दलहन पर समूह अग्रिम पंक्ति प्रदर्शन” शुरू किया गया; जिसको 2016-17 में भी जारी रखा गया। इस परियोजना का उद्देश्य, “देखकर विश्वास करना” के सिद्धांत पर, किसानों के लिए उच्च उत्पादन, बेहतर उत्पादकता और लाभकारी मुनाफे के लिए दालों के उत्पादन के सर्वोत्तम कृषि क्रियायों और तकनीकों का प्रदर्शन करना था। देश में दालों के उत्पादन को बढ़ाने के उद्देश्य से यह परियोजना, ICAR-ATARI के माध्यम से कृषि विज्ञान केन्द्रों (केवीके) द्वारा कार्यान्वित की गई।

क्षेत्र-1 में इस परियोजना को हरियाणा, पंजाब, हिमाचल प्रदेश और जम्मू-कश्मीर राज्यों के 49 कृषि विज्ञान केन्द्रों द्वारा लागू किया गया था। प्रदर्शनों के संचालन के लिए किसानों को बीज, जैव उर्वरक आदि जैसे मूलभूत आदानों को प्रदान करने के लिए कृषि विज्ञान केन्द्रों को ₹7500/प्रति हेक्टेयर दिए गए। खरीफ ऋतु के दौरान मूंग, अरहर, राजमा और उड़द पर 175.2 हेक्टेयर में कुल 811 अग्रिम पंक्ति प्रदर्शनों को लगाया गया।

रबी ऋतु में, 489.8 हेक्टेयर पर चना, मसूर और मटर पर 1894 अग्रिम पंक्ति प्रदर्शन लगाए गए थे। कुछ कृषि विज्ञान केन्द्र रबी व खरीफ के निर्धारित लक्ष्यों को हासिल नहीं कर सके। इसलिये कुछ अग्रिम पंक्ति प्रदर्शनों को गर्मी ऋतु में लगाया गया था। पंजाब में स्थानीय प्रचलित तकनीक की तुलना में, क्रमशः उड़द और अरहर के प्रदर्शन से 18.4 और 66.7 प्रतिशत अधिक पैदावार दर्ज की गई। हरियाणा में मूंग प्रदर्शनों में 49.6 प्रतिशत अधिक उपज प्राप्त हुयी; इसी तरह, हिमाचल प्रदेश में भी उड़द प्रदर्शनों में 38.9 प्रतिशत अधिक उपज दर्ज की गयी। उड़द और राजमा के प्रदर्शनों से 61.1 और 26.0 प्रतिशत क्रमशः जम्मू और कश्मीर में उच्च उपज दर्ज की गई। पंजाब, हरियाणा, हिमाचल प्रदेश और जम्मू-कश्मीर में स्थानीय प्रचलित तकनीक के मुकाबले रबी ऋतु में, चने में 25.6, 28.5, 29.8 और 25.1 प्रतिशत अधिक उपज दर्ज की गई। मसूर के प्रदर्शनों में, क्रमशः पंजाब और हरियाणा में 34.3 और 28.6 प्रतिशत अधिक उपज देखी गई।

क्षेत्र-1 के राज्यों में विभिन्न फसल प्रणालियों के अंतर्गत दालों की खेती को बढ़ावा देने के लिए, विस्तार गतिविधियों अर्थात् क्षेत्रीय भ्रमण, जागरूकता शिविर, नैदानिक भ्रमण, किसान वैज्ञानिक वार्तालाप, क्षेत्र दिवस, किसान गोष्ठी, Whatsapp समूह द्वारा संदेश, विधि प्रदर्शन, प्रदर्शनों की निगरानी, आदि गतिविधियों का आयोजन किया गया।



Executive Summary

Rising prices and increasing imports of pulses have alarmed the government to take steps for making the country self-sufficient in pulses production. Therefore; to boost the indigenous production of pulses in India, “Cluster Frontline Demonstrations on Pulses” project was initiated by the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Ministry of Agriculture and Farmers Welfare (MoA&FW) during 2015 and was continued in 2016-17. The aim of the project was to demonstrate as well as to disseminate the best practices and technologies of pulses production for higher production, better productivity and remunerative profitability for the farmers following the principle of “Seeing is Believing”. The project was implemented by ICAR-ATARIs through *Krishi Vigyan Kendras* (KVKs) with aim to enhance the pulses production in the country.

In Zone-I, the project was implemented by 49 KVKs of the states of Haryana, Punjab, Himachal Pradesh and Jammu and Kashmir this year. The budget of Rs.7500 per hectare was provided to the respective KVKs for providing basic inputs like seed, biofertilizers *etc.* to the farmers for conducting cluster demonstrations. During *kharif* season, total 811 FLDs were laid on an area of 175.2 has on green gram, pigeon pea, rajmash and black gram crops. While in *Rabi* season, a total of 1884 cluster frontline demonstrations (CFLDs) were conducted on 489.8 ha area on pulses like chickpea, lentil and field pea. Throughout different seasons, few of the KVKs were unable to achieve the targets, thus some of the FLDs were reallocated. While conducting demonstrations, the technologies like improved varieties, seed treatment, microbial inoculation, line sowing of crop, different intercropping systems, integrated pest management (IPM) pheromone traps *etc.* were demonstrated at the farmer's field. In Punjab, as compared to the local check, 18.4 per cent and 66.7 per cent higher yield were recorded from the demonstrations of mash and pigeon pea respectively. In Haryana, in comparison with local check, demonstrations on green gram reported 49.6 per cent higher yield; similarly, in Himachal Pradesh demonstrations on black gram recorded 38.9 per cent higher yield. From FLDs of black gram and rajmash; 61.1 and 26.0 per cent respectively higher yield was recorded in Jammu and Kashmir. During rabi season, in



chickpea FLDs, 25.6 per cent, 28.5 per cent, 29.8 per cent and 25.1 per cent higher yield was recorded as compared to local check in Punjab, Haryana, Himachal Pradesh, and Jammu and Kashmir. In demonstrations on lentil, 34.3 per cent and 28.6 per cent higher yield was recorded in Punjab and Haryana respectively.

For promoting the cultivation of pulses under different cropping systems across the states of Zone-1, different extension activities i.e. field visits, awareness camps, diagnostic visits, farmer-scientist interactions, field days, kisan goshtis, messages by whatsapp groups, method demonstrations, mobile advisories, monitoring of FLDs, etc. were conducted.



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Acronyms

ATARI	Agricultural Technology Application Research Institute
BBF	Broad Bed and Furrows
CCSHAU	Chaudhary Charan Singh Haryana Agricultural University
CSKHPKV	Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishvavidyalaya
DAC&FW	Department of Agriculture, Cooperation & Farmers Welfare
DWD	Directorate of Wheat Development
FAO	Food and Agriculture Organization
CFLDs	Cluster Frontline Demonstrations
GADVASU	Guru Angad Dev Veterinary and Animal Sciences University
ICAR	Indian Council of Agricultural Research
IIPR	Indian Institute of Pulses Research
IPM	Integrated Pest management
KVK	Krishi Vigyan Kendra
MSP	Minimum Support Price
NFSM	National Food Security Mission
NWPZ	North Western Plain Zone
PC	Programme Coordinator
PSB	Phosphorus Solubilizing Bacteria
SKUAST	Sher-e-Kashmir University of Agricultural Sciences and Technology
SRF	Senior Research Fellow
WHO	World Health Organization
YSPUH&F	Dr. Yashwant Singh Parmar University of Horticulture and Forestry



1. Introduction

Pulses are an important group of crops that contain high quality protein, which is the major source of dietary protein especially for the vegetarian population of the country. Pulses contain 22-24 per cent protein, which is almost double than the protein in wheat and thrice that of rice. Inclusion of pulses in diet provides nutritional and health related benefits. Dry pulses are very much efficient in dealing with cholesterol problem; and, due to their low fat and high pulp content, pulses are highly recommended for inclusion in diet of people suffering with diabetes and heart diseases. With their countless benefits, pulses are vital for ensuring food security. Moreover; pulses help in maintaining soil fertility through atmospheric nitrogen fixation and by releasing soil fixed phosphorus to the succeeding crop. These crops can be grown in different crop rotations, mixed and inter-cropping systems on wide range of soils and climatic conditions. They help to keep soil erosion in check with their more leafy growth and close spacing. They also provide additional fodder for the cattle and can be grown as green manuring crops. Since majority of pulses have short growth period, they can be used as catch crops and succeeding crop can be taken on the same farm. Thus, pulses play a significant role in sustainable farming system. Furthermore; pulses provide raw material for many industries like roasted grain industry, papad industry, dal industry etc.

In India, Madhya Pradesh, Maharashtra, Uttar Pradesh, Andhra Pradesh, Karnataka and Rajasthan are the major pulse growing states. The major pulses grown in India are chickpea or bengal gram (*Cicer arietinum*), pigeonpea or red gram (*Cajanus cajan*), lentil (*Lens esculenta*), urdbean or black gram (*Vigna mungo*) and mungbean or green gram (*Vigna radiata*). Chickpea has approximately 40 per cent share of the total pulses production in India; whereas, other major pulses like pigeonpea (18-20%), mungbean (11%), urdbean (10-12%), lentil (8-9%) and other legumes (20%) make rest of the share. However; minor pulse crops like horse gram (*Macrotyloma uniflorum*), cowpea (*Vigna unguiculata*), moth bean (*Vigna aconitifolia*), grass pea or khesari (*Lathyrus sativus*) and pea (*Pisum sativum* var. *arvense*) are also grown in some pockets of the country. In a country like India, where the majority of the population is vegetarian, the demand of pulses is increasing day by day due to increasing population and improving standards of living. As compared to the demand, the indigenous production of pulses has been considerably low; leading the government to import pulses to fulfill the consumer's demand. Therefore; the situation is that India is not only the largest producer and



consumer but also the largest importer of pulses. The per capita net availability of pulses in India is 43 g day⁻¹ (Anonymous, 2017); whereas, the World Health Organization (WHO) recommends 80 g capita⁻¹ day⁻¹ consumption for a healthy living. This low availability causes protein undernourishment particularly among the vegetarian inhabitants. Based on the estimates, it has been reported that India's population would reach 1.68 billion by 2030, thereby further increasing the demand of pulses. There is an immense need of pulses for nutritional security in order to meet the dietary requirements of growing population. The only pragmatic solution to this problem is that India has to increase its domestic pulses production, for which there is urgent need to develop and spread sustainable crop production technologies as well as rewarding policies for pulse growers.

Therefore; to increase area under pulse cultivation and to increase pulses production through achieving better productivity, Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW), Ministry of Agriculture and Farmers Welfare (MoAF&W) sanctioned the project "Cluster Frontline Demonstrations on Pulses" during *rabi* 2015 to ICAR-ATARIs of India, which was continued with a fresh sanction in year 2016-17. The project is being funded under National Food Security Mission (NFSM). During May 2016, National Food Security Mission (NFSM) sanctioned ₹123,60,000 to ICAR-ATARI, Zone-I, Ludhiana for conducting cluster frontline demonstrations (CFLDs) in the states of Haryana, Punjab, Himachal Pradesh and Jammu and Kashmir. Thus, CFLDs were laid by 49 Krishi Vigyan Kendras (KVKs) during 2016-17 and they were provided with ₹7500 per hectare for laying demonstrations on pulses viz. chickpea, lentil, field pea, green gram and black gram. ICAR-ATARI, Ludhiana was allowed to hire one Senior Research Fellow (SRF) and one Data entry operator (DEO) for implementing this project. The budget was also provided at the Zonal level for organization of one Zonal Workshop cum training, organization of two Group Meeting and miscellaneous expenditure on account of printing of reports (Annexure-I). Similarly; KVKs which would conduct CFLDs in at least 50 ha or more area either in *kharif*, *rabi* and summer season were allowed to hire one Pulse Technology Agent (PTA) for 6 months. The basic instructions given by the funding agency for implementing the project stated that the demonstrations of each pulse crop were to be organized in cluster approach covering at least 10 ha area in each cluster and for an individual farmer FLDs would not exceed more than 1 acre. Seed was considered as one critical input that was to be provided to the farmers for organizing the demonstrations. Improved varieties of the crops included in the demonstrations were not supposed to be older than 10 years. Chemical fertilizers were not allowed as an input



to be given to the farmers; however, bio-fertilizers, soil ameliorants, micro-nutrients etc. were permitted. On an area of 1480 ha in the four states, a total of 3700 FLDs were planned (Annexure I); however, some of the KVKs were not able to meet the targets in laying CFLDs because either the available crop varieties were older than 10 years which is not allowed as per guidelines or due to shortage or unavailability of quality seed.

Reference :

Anonymous (2017) : <http://eands.dacnet.nic.in/PDF/PerCapita-FoodGrains.pdf>.



2. Kharif 2016-17

Area under pulse crops cultivation in Northern India is meager; more specifically in the states of Punjab and Haryana it is negligible. Cropping pattern with rice and wheat as major crops is predominant in the region consequently leading to very poor crop diversification. Therefore; with an objective to increase the area under pulses cultivation and promote diversification in the region, FLDs were allotted to cover an area of 360 ha during *Kharif* season to 19 KVKs of Punjab, Haryana, Himachal Pradesh (H.P.) and Jammu & Kashmir (J&K). The KVKs were supposed to demonstrate improved production technologies of pulse crops namely black gram, green gram, rajmash and pigeon pea, thereby popularizing pulses cultivation in the region.

Out of the allotted FLDs, few KVKs were unable to meet the target either due to unavailability of the quality seeds or unavailability of seeds of varieties not older than 10 years particularly in Himachal Pradesh and Jammu and Kashmir. The deficit FLDs from *Kharif* season were thus reallocated to be conducted during *Rabi* season to meet the allotted target. The state-wise and crop-wise details of the allotted and conducted area under FLDs in Zone-I during *Kharif* season is given in Table 1.

Table 1: Progress of kharif season CFLDs during the year 2016-17

State	Crop	Target of FLDs approved		Achievements of FLDs	
		No. of Demo	Area (ha)	No. of Demo	Area (ha)
Punjab	Black gram	50	20	50	20
	Pigeon pea	50	20	50	20
	Green gram	150	60	0	0
Haryana	Green gram	100	40	100	40
Himachal Pradesh	Black gram	200	80	288	56
Jammu and Kashmir	Black gram	125	50	232	30
	Rajmash	200	80	91	9.2
	Greengram	25	10	0	0
Total		900	360	811	175.2

Punjab

In the state of Punjab, the target for conducting FLDs was for 100 ha area; which could not be achieved because farmers reap higher benefits from cultivating rice over any pulse crop, making it difficult for the KVK personnel to convince farmers for growing



pulses. Thus, KVKs were able to conduct demonstrations on an area of 40 ha only. Provision of ample irrigation facilities, provision of Minimum Support Price (MSP), assured market etc. lure farmers to cultivate rice, there by giving up pulses cultivation.

In Nawanshahar district, 50 FLDs on black gram were conducted on an area of 20 ha across Saroya, Aur, Balachour, Garshankar and Nawanshahar blocks. The recommended package of practices of PAU, Ludhiana i.e. improved variety Mash 114, seed rate of 6-8 kg seed per acre, row to row spacing of 30 cm, weed management through pre-emergence application of Stomp 30 EC (Pendimethalin) @1 litre per acre, nutrient management through application of urea @11 kg/acre and superphosphate @60 kg/acre were followed while conducting the FLDs. Moreover; for sucking pests (Jassid, aphid and white fly) management Malathion 50 EC @ 375 ml/acre or Rogor 30 EC@250 ml/acre or Metasystox 25 EC @ 250 ml/acre was recommended. Similarly; for managing tobacco caterpillar, Acephate 75 SP @ 800g or Chloropyriphos 20 EC @ 1.5 litre was used and Zineb 75WP @ 400g was also used for managing whitefly to control yellow mosaic virus.

Different planting systems like bed planting and planting on ridges were also followed to raise black gram. Following scientific cultivation practises resulted in 18.43 per cent higher yield in the demonstration fields over that of the local check.

Table 2: Details of *kharif* season FLDs in Punjab

KVK	Crop	Variety	FLDs (No.)	Area (ha)	Check yield (q/ha)	Demo. yield (q/ha)	Yield increase (%)
Nawanshahar	Black gram	Mash 114	50	20.00	7	8.29	18.43
Mansa	Pigeon pea	AL 201	50	20.00	4.5	7.5	66.67
Total			100	40.00			

Demonstrations on pigeon pea variety AL 201 were laid in Mansa district on an area of 20 ha. Sardulgarh, Jhunir and Bhikhi blocks of Mansa were selected to conduct the FLDs by following the pest management technologies like application of Deltamethrin 2.8 EC @ 200 ml for managing blister beetle and Indoxacaeb 14.5 SC @ 200 ml for controlling pod borer in 150-200 litre water using knapsack sprayer. As compared to the local check, 66.67 per cent higher yield was recorded from the demonstrations.



Fig 1: Director, ICAR-ATARI visits FLDs on black gram in Nawanshahar (Punjab)



Fig 2: KVK experts interacting with farmers in pigeon pea demonstration fields in Mansa district (Punjab)

Haryana

In Haryana, on MH 421 variety of green gram a total of 100 demonstrations were conducted on an area of 40 ha each in Bhiwani and Mahendargarh districts. As a result, overall 46.4 per cent higher yield was recorded from the demonstration plots over that of the local check.

In Bhiwani and Mahendargarh, MH 421 variety of green gram was demonstrated on an area of 20 ha each. In Mahendargarh, improved variety and other production technologies were followed in Satnali and Sihama blocks while conducting demonstrations. As a result, 19.64 per cent higher yield was recorded from FLDs over the local check. In Bhiwani, 73.24 per cent higher yield was recorded from Charkhi Dadri, Behal, Bawani Khara, Loharu and Siwani blocks over the local check.

The recommended practices of CCSHAU, Hisar followed during demonstrations were improved green gram variety MH 421; row to row spacing of 30 cm; seed rate of 15-20 kg/ha; treatment with *Rhizobium* culture and Carbendazim (Bavistin) @ 2g or Captan

@3g or Thiram 80% WP @ 4g per kg of seed; nutrients management with 15-20 kg N/ha and 40-60 kg P₂O₅/ha as basal dose; application of Pendimethalin @1-1.5 kg/ha in 500 litres of water, Blitox-50 or Indofil M-45@ 1.5 to 2.0 kg/ha in 500 litre of water for managing Cercospora leaf spot; Anthracnose control by Copper oxychloride 50% WP @5.0 g or Mancozeb 75% WP (Dithane M-45) @ 2.5 g; and, application of Malathion 25 EC or Methyl Parathion 50 EC or Cypermethrin 10 EC @1.0 ml per litre of water for Pod borer (*Helicoverpa obsoleta* Fab.) management.



Fig 3: Field visit to demonstrations on green gram in Bhiwani (Haryana)



Fig 4: Field day on green gram and monitoring visit to demonstrations in Mahendragarh (Haryana)

Table 3: Details of *kharif* season FLDs in Haryana

KVK	Crop	Variety	FLDs (no.)	Area (ha)	Check yield (q/ha)	Demo. yield (q/ha)	Yield increase (%)
Bhiwani	Green gram	MH 421	50	20.00	7.1	12.3	73.24
Mahendragarh	Green gram	MH 421	50	20.00	5.6	6.7	19.64
Total			100	40.00	6.4	9.5	49.6



Himachal Pradesh

In Himachal Pradesh, total 288 CFLDs were conducted on an area of 56.00 ha on black gram in Bilaspur, Hamirpur, Kullu, Mandi and Shimla. However; deficit of the demonstrations were reallocated to *rabi* season to achieve the target. As compared to the local check, 37.9 per cent higher yield was recorded from the demonstration in different districts.

In Jhandutta, Ghumarwin and Sadar blocks of Bilaspur district, UG 218 variety of black gram was demonstrated by following recommended integrated pest management (IPM) and other scientific production technologies. Whereas; in Hamirpur district, Him Mash 1 and UG 218 varieties were demonstrated in Nadaun, Bhoranj, Hamirpur, and Sujampur blocks by following recommended integrated nutrient management (INM) and other technologies. As compared to the local check, 78.69 per cent and 20.87 per cent higher yield were recorded in Bilaspur and Hamirpur districts respectively.

Black gram varieties Him Mash 1 and UG 218 were demonstrated in Ani block of Kullu and Karsog, Gohar, Sundernagar, Balh and Padhar blocks of Mandi. In FLDs of Kullu, seed treatment with Bavistin @ 2.5 g/kg seed was done and crop was sown by *Pora* method (manual line sowing). Resultantly; as compared to the local check, 10.58 per cent higher yield was obtained from the demonstration plots. In Mandi, as compared to local check, 24.41 per cent higher yield was recorded under demonstrations where biofertilizer application to seed was followed. Likewise; in Shimla, Him Mash-1 variety was demonstrated in Rohru and Jubbal blocks following line sowing method, which resulted in 54.84 per cent higher yield over that of the local check.

Table 4: Details of CFLDs of black gram in KVKs of Himachal Pradesh

KVK	Variety	CFLD (no.)	Area (ha)	Check yield (q/ha)	Demo. yield (q/ha)	Yield increase (%)
Bilaspur	UG 218	50	20.00	6.1	10.9	78.69
Hamirpur	Him Mash 1, UG 218	45	6.0	4.84	5.85	20.87
Kullu	Him Mash 1, UG 218	50	5.00	6.43	7.11	10.58
Mandi	Palampur -93, Pant U-19, UG 218 and Him Mash -1	93	20.00	5.1	6.345	24.41
Shimla	Him Mash -1	50	5.00	6.2	9.6	54.84
Total		288	56.00	5.7	8.0	38.9



Fig 5: Method demonstration on seed treatment of black gram and field visit to FLDs in Mandi



Fig 6: Demonstrations on black gram in Hamirpur (H.P.)

Jammu & Kashmir

The demonstrations on black gram were conducted in Kathua, Rajouri and Reasi districts; whereas in Anantnag and Pulwama districts production technologies of rajmash were demonstrated. The demonstrations on black gram resulted in 56.33 per cent higher yield than the local check; where 232 demonstrations were conducted on 30 ha area. Over the local check, 25.4 per cent higher yield was recorded from the demonstrations of

Table 5: Details of CFLDs on black gram & rajmash conducted by the KVKs of Jammu & Kashmir

KVK	Variety	CFLDs (no.)	Area (ha)	Check yield (q/ha)	Demo. yield (q/ha)	Yield increase (%)
Blackgram						
Kathua	Mash PU -31	114	20	5.25	9.75	85.71
Rajouri	Mash PU -19	67	6	3	3.93	31.00
Reasi	Mash PU -31	51	4	4.4	6.7	52.27
		232	30	4.22	6.8	61.1
Rajmash						
Anantnag	Wazej Rajmash	45	6.65	7.90	8.66	9.62
Pulwama	Wazej Rajmash	46	2.55	8.5	12.0	41.18
Total		91	9.2	8.20	10.3	26.0



rajmash, whereas, total 9.2 ha area was covered under 91 the demonstrations. Details of the variety have been given in Table 5.

In Kathua district, Hiranagar, Kathua, Basohli and Billawar blocks were selected to demonstrate Mash PU-31 variety of black gram. As compared to the local check, 85.71 per cent higher yield was obtained from FLDs due to adoption of weed management and plant protection measures. Similarly; black gram variety Mash PU-19 was demonstrated, in Nowshera and Sunderbani blocks, of Rajouri; where, 31.00 per cent higher yield was recorded, which was attributed to adoption of recommended production technologies. Likewise; in Reasi, Mash PU-31 variety was demonstrated in Thoru, Pouni, Katra, Panchari and Udhampur blocks, where 52.27 per cent higher grain yield was obtained from FLDs over the local check.

Doru and Shahabad block of Anantnag district was chosen for conducting the demonstrations on Wazej Rajmash variety of rajmash. From demonstrations, 9.62 per cent higher yield was recorded over the local check. The increment in yield can be credited to biofertilizer (PSB) treatment to the seed before sowing. In Pulwama, Wazej Rajmash variety was demonstrated in Awantipora and Badimarg blocks. From demonstrations, 41.18 per cent higher grain yield was recorded over the local check, which was due to improved variety and line sowing.



Fig 7: CFLDs on black gram in Kathua and Reasi (J&K)

Extension activities

Across the states of Zone-1, different extension activities viz. field visits, awareness camps, diagnostic visits, farmer-scientist interactions, field days, kisan goshtis, message by whatsapp group, method demonstrations, mobile advisories, monitoring visits and other miscellaneous activities were conducted during *Kharif* 2017 in which 3924 farmers took part along with 813 extension personals (Table 6). The aim of the extension activities was to promote cultivation of pulses under different cropping systems. Different trainings were also organized by the KVKs on pulses cultivation (Table 7) in which total 1001 farmers participated.



Table 6: Extension activities conducted during *kharif* season CFLDs

Activities	Farmers			Extension personnel		
	Men	Women	Total	Men	Women	Total
Field visit	285	84	382	22	4	187
Awareness camp	225	25	290	11	1	16
Diagnostic visit	42	12	54	3	1	4
Farmer scientist interaction	380	21	401	12	1	63
Field day	1850	375	2244	126	10	486
<i>Kisan goshthi</i>	27	-	27	2	-	2
Message by whatsapp group	35	-	-	-	-	-
Method demonstration	15	17	32	5	-	5
Mobile advisory	135	-	135	-	-	-
Monitoring of FLDs	65	11	76	12	-	12
Miscellaneous activities	237	45	283	37	1	38
Total	3296	590	3924	230	18	813

Table 7: Trainings conducted on pulses production/cultivation

Training	Participant farmers (general)-A			Participant farmers (SC/ST)-B			Total participants (A+B)		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Off campus	590	143	735	146	36	182	684	181	915
On campus	62	2	64	22	0	22	84	2	86
Total	652	145	799	168	36	204	768	183	1001



Glimpses of implementation of the CFLD Pulses 2016-17 project in the states of Zone-I



Fig 8: Raised bed sowing of black gram in Nawanshahar



Fig 9: Method demonstration on seed treatment with biofertilizers in Mandi district



Fig 10: Monitoring visit by Dr. Rajbir Singh in Bhiwani (left) and visit by monitoring team in Nawanshahar (right)



3. Rabi Pulses 2016-17

During *rabi* 2016-17; total 1884 demonstrations on chickpea, field pea and lentil were conducted on an area of 489.8 ha. A total of 1773 FLDs were conducted on chickpea on 449.8 ha area, while 111 FLDs were organized on lentil crop on 40 ha area. The target FLDs on chickpea could not be achieved in Punjab, since farmers prefer to cultivate wheat than pulse crops. Better irrigation facilities, assured market, Minimum Support Price (MSP) etc. lure farmers to grow wheat crop during *rabi* season. Similarly; FLDs on field pea could not be laid in the state of Jammu and Kashmir because of social unrest in the region. Therefore, the deficit FLDs were reallocated to the succeeding season to meet the target.

Table 8: Progress of CFLD pulse project during *rabi* 2016-17

Crop/state	Target		Achievements	
	No. of Demo	Area (ha)	No. of Demo	Area (ha)
Chickpea				
Punjab	575	230.0	719	204.0
Haryana	400	160.0	365	160.0
HP	147	58.3	359	58.3
J&K	100	40.0	330	27.5
Total	1222	488.3	1773	449.8
Lentil				
Punjab	50	20.0	69	20.0
Haryana	50	20.0	42	20.0
Total	100	40.0	111	40.0
Field pea				
J&K	147	58.5	0	0
Grand total	1469	586.8	1884	489.8

Results

Punjab

In Punjab; Amritsar, Bathinda, Faridkot, Fatehgarh Sahib, Ferozepur, Gurdaspur, Hoshiarpur, Nawanshehr, Patiala and Sangrur districts were selected to demonstrate the scientific cultivation chickpea crop with varieties PBG 5, PBG 7 and GPF 2. A total of 719 FLDs on chickpea were conducted on an area of 204 ha in Punjab. The major production technologies like seed treatment with *Rhizobium* culture, application of Chloropyriphos and Bavistin; weed management practices; plant protection measures and other recommended package of practices were followed to conduct the demonstration at the



farmer's field. Consequently; from the demonstration fields of chickpea, 25.6 per cent higher yield was recorded over the field cultivated as local check for comparison. The maximum percentage increment in yield was recorded in Sangrur i.e. 45.3 per cent, while the lowest was in Bathinda i.e. 4.2 per cent. Similarly; lentil crop variety LL 699 was demonstrated in Hoshiarpur with 69 FLDs on an area of 20 ha. The demonstrated plots recorded 34.3 per cent higher yield over the local check.

The package of practice recommended by PAU, Ludhiana for cultivating chickpea included recommended varieties [*desi gram* (irrigated)-PBG 7, GPF 2, PBG 5, PBG 1; *desi gram* (rainfed)- PDG 3, PDG 4; *kabuli gram*- L 552, BG 1053, L550]; sowing time under rainfed conditions from 10 to 25 October, while 25 October to 10 November under irrigated; sowing by following *pura* method (line sowing) with row-to-row distance of 30 cm; seed treatment [insecticide (Chloropyriphos 20EC@10ml/kg), fungicide (Captan/Bavistin @3g or Rovral @2.5g per kg of seed), seed inoculation with *Mesorhizobium* (LGR33) and *Rhizobacterium* (RB-1)]; weed management [hand weeding (30 and 60 DAS) or pre-plant application of Treflan 48 EC @1 litre or pre-emergence Stomp 30 EC @1 litre]; and, nutrient management [13 kg urea and 50 kg SSP

Table 9: Results of Rabi season CFLDs in Punjab

Crop/Name of KVK	Variety	Demonstrations		Yield (q/ha)		Increase in yield (%)
		FLDs (no.)	Area (ha)	Demo field	Local check	
Chickpea						
Amritsar	PBG 7	114	30	17.3	13.5	28.1
Bathinda	PBG 7, GPF 2	48	20	17.2	16.5	4.2
Faridkot	PBG 7	88	20	12.5	12.5	0.0
Fatehgarh Sahib	PBG 7	71	20	17.85	14.71	21.3
Ferozepur	GPF 2	100	20	17.8	15.4	15.6
Gurdaspur	PBG 7	50	20	14.89	13.3	12.0
Hoshiarpur	PBG 5	67	14	9.64	7.4	30.3
Nawanshehr	PBG 5	40	20	17.5	11.25	55.6
Patiala	GPF 2	52	20	15.85	11.5	37.8
Sangrur	PBG 7	89	20	18.16	12.5	45.3
Total		719	204	15.87	12.86	25.6
Lentil						
Hoshiarpur	LL 699	69	20	8.37	6.23	34.3
Total		69	20	8.37	6.23	34.3



per acre for *desi* gram and 13 kg urea and 100 kg SSP per acre for *kabuli* gram]. Under plant protection measures, Chloropyriphos 20EC@10ml/kg for termite control, 20 ml Indoxcarb 14.5SC or 60 ml Spinosid 45SC per acre for gram caterpillar control and Indofil M45 was used for controlling the blight and grey mould.

In Ajnala, Majitha, Verka, Harsha China and Chogawan blocks of Amritsar; chickpea crop variety PBG 7 was demonstrated. Seed and bio-fertilizers were provided as inputs to the farmers. As compared to that of local check, 28.1 per cent higher yield was recorded from the frontline demonstrations. Similarly; in Bathinda, PBG 7 and GPF 2 varieties of chickpea were demonstrated in Sangat, Bathinda, Phul and Maur blocks, which resulted in increase in the yield by 4.2 per cent over the local check. Likewise; complete package of practices as per the recommendations of PAU, Ludhiana were followed to conduct the FLDs on PBG 7 variety of chickpea in Kotkapoora and Faridkot blocks of Faridkot district, where demonstrations yielded at par with local check. Demonstrations on PBG 7 variety of chickpea in Khera, Sirhind, Bassi Pathana and Khamano blocks of Fatehgarh Sahib district resulted in increase in the yield by 21.3 per cent over the local check. Likewise; as compared to the local check, 15.6 per cent higher yield was recorded from FLDs of chickpea variety GPF 2 in Makhu and Ghal Khurd blocks of Ferozepur.

In Gurdaspur; Kalanaur, Sri Hargobindpur, Kahnoolan, Batala and Dinanagar blocks were selected to conduct the FLDs on PBG 7 variety of chickpea; which has recorded increased yield by 12.0 per cent in the demonstrated farms over the local check. In Hoshiarpur-II, Mahilpur, Mukerian and Garshankar block of Hoshiarpur district, PBG 5 variety of chickpea was demonstrated along with recommended cultivation practices of PAU, Ludhiana that resulted in higher yield to extent of 30.3 per cent over the local check. Chickpea variety PBG 5 was demonstrated in Aur, Nawanshahar, Garshankar, Banga, Saroya and Balachour blocks of the Nawanshahar district. The yield recorded from the FLDs was reported to be 55.6 per cent higher over that of the local check, which can be attributed to the followed recommendations of PAU, Ludhiana. Chickpea variety PBG 7 was demonstrated in Nabha, Sanaur, Bhadson, Patran, Samana and Rajpura blocks of Patiala; and, Lehragaga, Sangrur, Dhuri and Sunam blocks of Sangrur. As compared to the local check, 37.8 and 45.3 per cent higher yield was recorded from FLDs from Patiala and Sangrur respectively.

Further; in Hoshiarpur; LL 931 variety of lentil was demonstrated in Hoshiarpur-II, Mahilpur, Mukerian and Garshankar blocks. As compared to the local check, 34.3 per cent higher yield was recorded by following the recommendations of PAU, Ludhiana.



Fig 11: Input distribution in Ferozepur (left) and Field day on chickpea in Gurdaspur (right)



Fig 12: Chickpea and lentil crop stands in Hoshiarpur



Fig 13: Field preparation in Nawanshahar (left) and Field visit in Sangrur (right)



Haryana

Total 365 FLDs on chickpea varieties namely HC 1, KC 1, CJS 515, GNG 1928 and GNG 1581 were organized in Ambala, Karnal, Bhiwani, Hisar, Mahendergarh and Rewari districts of Haryana on an area of 160 ha (Table 10). As compared to the local check, 28.5 per cent higher yield was recorded from the demonstrations of chickpea crop. Similarly; in Yamunanagar, 28.6 per cent higher yield was recorded from 42 FLDs of lentil variety LL 931 from an area of 20 ha. The technologies demonstrated at the farmer's field were improved variety, seed treatment with Chloropyrifos and *Rhizobium* culture etc.

According to the recommendations of the CCHAU, Hisar; middle of October in rainfed areas and middle of November under irrigated condition is the optimum time for the sowing of recommended varieties i.e HC 1, CJS 515, KC 1. For timely planting of *desi* gram 40-45 kg seed per ha is adequate but in case of *kabuli* types the optimal seed rate is 80-100 kg per ha. *Rhizobium* culture is used for seed treatment before sowing the crop. The optimal row spacing for timely sown crop is 30cm, whereas for rainfed condition it should be 45 cm. Under nutrient management, 15-20 kg N per ha and 40-60 kg P₂O₅ per ha is recommended. Pre-sowing application of Fluchloralin@1.0 kg per ha or Pendimethalin@1 kg per ha, as pre-emergence herbicide, is recommended for weed management. For blight disease management, seeds should be treated with Bavistin or Captain @2.5 g/kg seed and field can be sprayed with Dithane M-45 @ 0.2%. Termites are

Table 10: Results of CFLDs on chickpea in Haryana

Name of KVK	Variety	Demonstrations		Yield(q/ha)		Increase in yield (%)
		FLDs (No.)	Area (ha)	Demo field	Local check	
Chickpea						
Ambala	GNG 1581	75	30	18.27	13	40.5
Karnal	HC 1	53	20	18	14.82	21.5
Bhiwani	CJS 515	44	30	19	12	58.3
Hisar	CJS 515	75	30	15.21	13.2	15.2
Mahendergarh	GNG 1581, GNG 1928	99	40	15.84	13.15	20.5
Rewari	KC 1, CJS 515	19	10	14.12	12.27	15.1
Total		365	160	16.74	13.07	28.5
Lentil						
Yamunanagar	LL 931	42	20	12.86	10	28.6
Total		42	20	12.86	10	28.6



controlled by treating the 100 kg seed with 850 ml Monocrotophos 36SL or 1500 ml Clorpyrifos 20 EC. Moreover; for cut worms' control, spray Fenvalrate 20 EC @ 200 ml or Cypermethrin 25 EC @125 ml or Decametharin 2.8 EC @ 225 ml. Similarly; Quinalphos 25 EC @1 liter or Carbaryl 50 WP @1 kg or Monocrotophos 36 SL @ 500 ml or Fenvalerate 20 EC @ 200 ml or Cypermetharin 10EC @ 300 ml is recommended against pod borers.

FLDs on GNG 1581 variety of chickpea were conducted in Naraingarh, Shahzadpur, Barara and Saha blocks of Ambala. Over the local check, 40.5 per cent higher yield was recorded from demonstration and this improvement in yield is undoubtedly due to seed inoculation with *Rhizobium* + PSB and application of 12 kg urea and 100 kg SSP per ha. Similarly; as compared to the local check, 21.5 per cent higher yield was obtained from FLDs of HC 1 variety of chickpea that was demonstrated in Nilokheri, Nissing, Karnal, Indri and Gharaunda blocks of Karnal district. Seed treatment with biofertilizer (*Rhizobium*+ PSB) and basal dose of DAP@85 kg and Zinc sulphate @ 25 kg/ha have resulted into improvement in the yield.

Behal and Badhra blocks of Bhiwani were selected to conduct the FLDs on chickpea variety CJS 515, where 58.3 per cent higher yield was recorded over the local check. This improvement in the yield can be attributed to the use of high yielding variety, seed treatment with biofertilizers, recommended fertilizers application, weed management and plant protection measures. Similarly; in Hisar, over the local check, 15.2 per cent higher yield was recorded from demonstrated plot from Agroha, Adampur, Hisar-I, Hisar-II and Uklana blocks where CJS-515 variety was used for demonstrations. Improved agronomic and plant protection measures and favorable weather conditions during crop growth period have resulted in higher yield.

Improved varieties, GNG 1581 and GNG 1928, were demonstrated in Satnali and Nangal Chaudhary blocks of Mahendragarh district. Seed treatment with Bavistin (2g/kg seed), Rhizotika and PSB; and, management of pod borer with application of Novaluron 10% EC @ 150 ml/acre have resulted in increase the yield by 20.5 per cent over the local check. In Rewari district, Jatusana and Khol blocks were selected to conduct the FLDs on KC 1 and CJS 515 varieties of chickpea. The demonstrations have resulted in increase the yield by 15.1 per cent over the local check and the farmers were found to be satisfied with the performance of variety KC 1.

Lentil variety LL 931 was demonstrated in Radaur, Muatafabad, Jagadhri and Sadaura blocks of the Yamunanagar district. As compared to local check, 28.6 per cent higher yield was recorded from the demonstrated plots. This increment in yield can be attributed to improved variety, seed treatment with biofertilizer (Phosphotika) and weed management (Pre-emergence herbicide application of Stomp @ 1litre/acre).

Glimpses of CFLD on Pulses



Fig 14: Input distribution in Ambala (left) and Weeding operation in chickpea in Bhiwani (right) Haryana



Fig 15: Training on chickpea production in Hisar (left) and Farmer-scientist interaction in Karnal (right) Haryana



Fig 16: Field visit by scientists in Mahendargarh (left) and Field day on gram in Rewari (right)



Himachal Pradesh

In Himachal Pradesh, major recommended technologies like improved variety, seed treatment with fungicide, phosphorus solubilizing bacteria (PSB) and *Rhizobium* were followed to demonstrated pulses production technologies. A total of 359 CFLDs were conducted on an area of 58.3 ha at farmer's field in Bilaspur, Hamirpur, Mandi, Shimla and Una districts. Chickpea varieties viz. HC 1, HC 2, GPF 2, GNG 1581 and HC 5 were used for demonstrations, which resulted in increase in the yield by 29.8 per cent over that of the local check.

Table 11: Results of CFLDs on chickpea in Himachal Pradesh

Name of KVK	Variety	Demonstrations		Yield (q/ha)		Increase in yield (%)
		FLDs (no.)	Area (ha)	Demo	Local check	
Bilaspur	HC 1, HC 2, GPF 2	50	20	8.6	6.1	41.0
Mandi	GNG 1581, HC 2	61	20	5.8	4.5	28.9
Hamirpur	GNG 1581	29	3.3	6.57	5.8	13.3
Una	HC 5	150	10	7.84	5.45	43.9
Shimla	HC 1	69	5	6.05	4.95	22.2
Total		359	58.3	7.2	5.5	29.8

Sader, Jhandutta and Ghumarwin blocks of Bilaspur district were selected to conduct the CFLDs on chickpea varieties HC 1, HC 2 and GPF 2 by following weed management and integrated pest management technologies. This resulted in 41.0 per cent higher yield in the demonstration plots as compared to the local check. Similarly; in Mandi district, CFLDs on chickpea varieties GNG 1581 and HC 2 were laid in Karsog, Sundernagar, Gopalpur, Drang, Gohar and Balh blocks. Over the local check, 28.9 per cent higher yield was recorded from CFLDs. This increment could be attributed to improved variety, seed inoculation with *Rhizobium* and PSB and line sowing of the crop.

In Hamirpur district, integrated nutrient management technologies were followed to conduct the CFLDs on GNG 1581 variety of chickpea in Nadaun, Sujampur, Bhoranj, Tauni Devi and Hamirpur blocks. This resulted in 13.3 per cent higher yield over that of the local check. Similarly; in Una district, as compared to the local check, 43.9 per cent higher yield was recorded from FLDs of chickpea variety HC 5 from Una and Amb blocks. This improvement in yield can be ascribed to use of improved variety HC 5. In Shimla, line sowing method was the demonstrated and as compared to the local check 22.22 per cent higher yield was recorded from demonstrated HC 1 variety of chickpea.



Fig 17: Farmer's visit to CFLDs of chickpea in Bilaspur (left) and Hamirpur (Right) H.P.



Fig 18: Awareness camp in Una (left) and Method demonstration on seed treatment in Mandi (right) H.P.

Jammu and Kashmir

In the state of Jammu & Kashmir, 330 demonstrations were conducted on an area of 27.5 ha in Jammu, Reasi and Rajouri districts on chickpea variety GNG 1581 (Table 12). High yielding variety and complete package of practices recommended by SKUAST, Jammu were followed to conduct the demonstrations. As a result, overall 25.1 per cent higher yield was recorded from the demonstration plots over that of the local check.

GNG 1581 variety of chickpea was demonstrated in Nagorata, Samba, Bishnah, Khour and Dansal blocks of Jammu. As compared to the local check, 11.8 per cent higher yield was recorded from the demonstrations and this increment can be attributed to use of the technologies like improved variety, nutrient management and integrated pest management. Pheromone traps, as a part of integrated pest management, were also used for controlling *Helicoverpa armigera* insect in chickpea.



Similarly; as compared to the local check, 8.8 per cent higher yield was recorded from CFLDs of chickpea variety GNG 1581 that were laid in rainfed areas of Nowshera and Sunderbani blocks of Rajouri district. The demonstrations were carried out by following integrated nutrient management technologies. Chickpea variety GNG 1581 was found acceptable among farmers; but, since there was no rainfall for about three months, the germination of the crop was very poor consequently leading to lower yield in the demonstration fields.

Likewise; Pouni, Reasi, Mahore, Katra and Panchari blocks of Reasi district were selected to demonstrate the GNG 1581 variety of chickpea. Over the local check, 54.7 per cent higher yield was recorded from CFLDs and this can be ascribed to use of technologies like INM, line sowing and IPM practices followed while demonstrating CFLDs.

Table 12: Results of FLDs in Jammu & Kashmir

Name of KVK	Variety	Demonstrations		Yield(q/ha)		Increase in yield (%)
		FLDs (no.)	Area (ha)	Demo	Local check	
Jammu	GNG 1581	204	16.5	5.7	5.1	11.8
Rajouri	GNG 1581	45	5	3.7	3.4	8.8
Reasi	GNG 1581	81	6	8.2	5.3	54.7
Total		330	27.5	6.95	5.2	25.1

Extention activities

With the objective to disseminate the improved production technologies among farmers, extension programmes were organized by the KVKs in which 9333 farmers including men and women participated along with 860 extension personnel (Table 13). Activities like field visits, training camps, diagnostic visits, farmer-scientist interactions, field days, method demonstrations, monitoring visits, *kisan gosthis* etc. were carried out for the better adoption of recommended technologies among farmers. Moreover; various off and on-campus trainings on topics like production technologies of chickpea, pre-rabi training programme on pulse production, INM in rabi pulses, installation of pheromone traps, weed management and plant protection measures in pulses, importance of pulse crops in diversified agriculture, training on seed treatment of gram etc.were also organized (Table 14).

Table 13: Extension activities conducted during Rabi season

Activities	Farmers			Extension personnel		
	Men	Women	Total	Men	Women	Total
Field Visit	843	35	878	51	30	81
Training Camp	484	24	508	20	0	20
Diagnostic visit	142	59	201	16	8	24
Farmer scientist interaction	1012	266	1278	63	41	104
Field Day	1785	281	2066	42	20	62
Method demonstration	265	59	324	8	2	10
Monitoring visit	640	30	670	64	53	117
<i>Kisan gosthi</i>	266	12	278	20	0	20
Miscellaneous	2588	542	3130	154	268	422
Total	8025	1308	9333	438	422	860

Table 14: Trainings organized during Rabi season

Training	Farmers (General)-A			Farmers (SC/ST)-B			Total (A+B)		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Off campus	1963	267	2230	396	99	495	2359	366	2725
On campus	472	58	530	39	14	53	511	72	583
Total	2435	325	2760	435	113	548	2870	438	3308

Glimpses of extension activities conducted during Rabi season 2016-17



Fig 19: Field day on gram in Gurdaspur and Hoshiarpur (Punjab)



Fig 20: Field day in Hisar and Field visit in Rewari

Glimpses of demonstrated technologies under CFLDs



Fig 21: Chickpea on sown ridges in Ambala (left) and Method demonstration on seed treatment in Bhiwani (right)



Fig 22: Sprinkler in demonstration system in Rewari (left) and Chickpea sowing in Bhiwani (right)



Fig 23: Lentil and chickpea in Agro-forestry system in Hoshiarpur



Fig 24: Pheromone traps in Jammu



4. Zonal workshop cum training programme of Cluster FLDs on Pulses 2016-17

A review workshop on project “Cluster Frontline Demonstrations on Pulses 2016-17” was organized by ICAR-ATARI, Zone-I, Ludhiana at the conference hall of Directorate of Extension Education, PAU, Ludhiana on January 24, 2017. Dr. A. K. Mehta, Former Consultant NFSM and former ADG (Extension) was the Chief Guest of the programme. Dr. Rajbir Singh, Director, ICAR-ATARI, Ludhiana; Dr. R.S. Sidhu, Director Extension Education, PAU, Ludhiana; Dr. H.K. Verma, Director Extension Education, GADVASU, Ludhiana; Dr. D.S. Dillon, Director (Seeds), PAU, Ludhiana; Dr. Aulakh and Dr. G.S. Buttar, Additional DEE, PAU, Ludhiana and Dr. Suresh Kumar Yadav, Technical Officer, Directorate of Wheat Development, Gaziabad were the other dignitaries present during the workshop. Moreover, the workshop was attended by around eighty (80) Programme Coordinators and Scientists of *Krishi Vigyan Kendras* (KVKs) of Zone-I conducting demonstrations under the project and the Scientists from ICAR-ATARI, Ludhiana.

The Chief Guest of the programme, Dr. A. K. Mehta, Former Consultant NFSM and former ADG (Extension) ICAR discussed about the production and import scenario of pulse crops in India and highlighted the broad objectives of the project. He shared his experiences with the project and provided practical solutions to some of the problems and constraints faced by the KVK.

Dr. Rajbir Singh, Director, ICAR-ATARI, Ludhiana gave a brief remark about the project and highlighted the problems faced by the KVKs in implementing the project. He demanded more flexibility in allocating the FLDs to the KVKs. He also expressed his own vision of increasing the pulse production in the states of Punjab, Haryana, Himachal Pradesh and Jammu & Kashmir which would not only promote diversification but would also increase the profitability of farmers. He also stressed upon the need for soil testing of each field under FLD.

Dr. Guriqbal Singh, Sr. Agronomist, Pulse section, PAU, Ludhiana has delivered a lecture on improved agronomic practices for *rabi* and summer pulses.

Programme Coordinators of KVKs presented the activities conducted under the project, budget utilization, problems faced and lessons learned. The workshop involved in-depth discussion on various issues in implementing the project and resulted in practical way out of the problems faced by the KVKs.



Following action points emerged during the workshop:

- 1) KVKs should strictly conduct FLDs following cluster approach.
- 2) All the Subject Matter Specialists in KVKs should work as a team and plant protection scientists should actively be involved during field days etc.
- 3) Sanction of the project and release of funds from the ICAR Headquarter should be timely communicated for proper implementation of the project.
- 4) FLDs should be allocated as per the action plan and there should be more flexibility to reallocating FLDs at ATARI Institute.
- 5) Provision of funds for few crops like gram should be increased considering the high cost of the seed.
- 6) Efforts should be made to re-notify the popular variety of summer moong SML-668 so that it can be used in the project.
- 7) KVKs and concerned Universities should ensure the timely submission of the crop-wise Utilization Certificates (UCs) and Audit Utilization Certificates (AUCs) of the project for early release of funds.
- 8) Directorate of Extension Education of State Agricultural Universities should ensure timely availability of quality seed of latest varieties and should give priority to FLDs.
- 9) If there is any delay in release of funds, KVKs may utilize funds from regular contingency and revolving fund of the KVKs.
- 10) Funds sanctioned under one crop should not be utilized for laying FLDs on any other crop.
- 11) Local checks must be defined in concrete terms to properly compare the results of FLDs.
- 12) KVKs should send information strictly in given format and good quality action photographs in jpg format.
- 13) KVKs, which have been allowed to hire Pulse Technology Agents (PTA), should hire PTAs as early as possible.
- 14) Deficit FLDs from rabi season should be re-allotted to summer season to meet targets.
- 15) KVKs of Punjab should procure seed of summer moong variety SML-832 @ 12kg/acre/KVK from Director (Seeds), PAU, Ludhiana and produce seeds at KVK farm itself for the next season.
- 16) Soil testing of all the fields covered under CFLD project should be an integral part of the project.



- 17) Case studies and success stories of individual farmers as well as over a large area such as block or district level should be carved out of the project activities.
- 18) In salt affected areas, salt tolerant varieties of ICAR-CSSRI, Karnal should be promoted.
- 19) KVKs should go beyond pulses production and should popularize processing and value addition of pulses for higher profitability to the farmers.
- 20) KVKs should collaborate with other departments like District Agricultural and Extension Officer for showcasing their technologies in frontline demonstrations.
- 21) Each KVK should publish comprehensive report about the project.
- 22) Whatsapp group of the farmers under the project should be formed to disseminate information regularly and advisory services should be provided to the farmers through SMS.
- 23) KVKs should promote cultivation of pulses for domestic consumption of the farmers and as seed for the next season.

Glimpses of Zonal Review Workshop



CFLD on Pulses project in media



Monitoring of the CFLDs on chickpea

To assess the progress of CFLDs on *Rabi* pulses monitoring team was constituted by the ICAR-ATARI, Ludhiana. The team included Dr. Mahesh Kumar, Assistant Director, DWD, Ghaziabad; Dr. H.S. Bajwa, Extension Specialist, Punjab Agricultural University, Ludhiana; Dr. Surinder Sandhu, Head of Oilseed Section, PAU, Ludhiana; Dr. Preeti Mangai, Senior Scientist, ICAR-ATARI, Zone-I, Ludhiana; Dr. Jugraj Singh, Programme Coordinator, KVK Nawashahar; Ms. Akku Bala, SRF, CFLDs on Oilseed; and Mr. Narinder Singh, SRF, CFLDs on Pulses visited the demonstration plots of chickpea in Noorpur and Garhi Kangoan villages in Banga, Nawashahar and Balachaur blocks. Farmers were satisfied from crop growth and performance, however, they were worried about the marketing and minimum support price of the produce. During interaction, the team suggested about value addition and packaging of chickpea at farm level. The farmers were progressive and were following the guidelines as provided by the KVK team.



Fig 25: Monitoring team visiting the FLDs of chickpea in Nawashahar



Administrative approval of the project CFLD Pulse 2016-17

F.No. CPS 18-3/2016-NFSM
Government of India
Ministry of Agriculture and Farmers Welfare
Department of Agriculture, Cooperation and Farmers Welfare
(NFSM-Cell)

Krishi Bhawan, New Delhi,
Dated: 11.05.2016

To,
Assistant Director General (Agri. Extn.)
ICAR, Division of Agriculture Extension
Krishi Anusandhan Bhavan,
Pusa, New Delhi-110012

Sub: Project on "Cluster Frontline Demonstrations on Pulses during 2016-17" funding under NFSM-Pulses-reg.

Sir,

I am directed to refer to your D.O. No. 10-35/2015-AE-II dated 2nd May, 2016 and to convey that the competent authority of this Department has approved the Project entitled "Cluster Frontline Demonstrations on Pulses during 2016-17" funding under NFSM under Centrally Sponsored Scheme of National Food Security Mission (NFSM) for the financial year 2016-17 with a total outlay of **Rs. 2529.10 Lakhs (Rupees two thousand, five hundred twenty nine lakh and ten thousand only)**

2. The component/ATARI, Zone-wise budget approved is as under:-

Implementing agency/ Zone	No. Of KVK	No. Of FLDs (Area in ha)	Budget (in Rs.)	*Contractual Staff (in Rs.)			Zonal Workshop cum Training	Organiza tion of Group Meetings	Misc. exp.	Total (in Rs.)
				SRF	DEO	Technology Agent at KVKs				
ATARI,Zone I,Ludhiana	49	1480	11100000	360000	180000	480000	100000	100000	40000	12360000
ATARI, Zone - II, Kolkata	81	6650	49875000	390000	180000	3840000	100000	100000	40000	54525000
ATARI,Zone-III, Meghalaya	44	2490	18675000	330000	180000	1440000	100000	100000	40000	20865000
ATARI,Zone-IV,Kanpur	76	4540	34050000	750000	180000	2040000	100000	100000	80000	37300000
ATARI,Zone-V,Hyderabad	74	4030	30225000	390000	180000	900000	100000	100000	40000	31935000
ATARI,Zone-VI,Jodhpur	57	2940	22050000	360000	180000	1200000	100000	100000	40000	24030000
ATARI,Zone-VII,Jabalpur	92	7310	54825000	360000	180000	3660000	100000	100000	40000	59265000
ATARI,Zone-VIII,Bengaluru	61	1560	11700000	390000	180000	120000	100000	100000	40000	12630000
Total	534	31000	232500000	3330000	1440000	13680000	800000	800000	360000	252910000

* Contractual staff including one SRF and one data for each ATARI and one SRF for ICAR headquarter.
One workshop-cum-training and two group meetings for each ATARI.

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11/5/16



-2-

3. The above project has been approved with the following conditions:

- The demonstrations of each pulse crop should be organized in cluster approach (at least 10 ha. for each cluster).
- ICAR should provide seed as one of critical inputs to farmers for organization of demonstration.
- The varieties of pulse crops to be included in the demonstrations should not be older than 10 years.
- More focus should be given to organize demonstration of pulses in rice fallow areas in eastern India.
- 10% of FLD fund earmarked (Rs. 7500/ha) is allowed to utilized for monitoring, distribution of literature and organization of field day.
- Chemical fertilizers are not allowed as input under FLD. However payment of various operations/ services and inputs (seed, bio-fertilizers, soil ameliorants, micro-nutrients etc.) are allowed. Farmers have to apply recommended dose of chemical fertilizers to attain potential yield.
- The scientists from KVK will conduct visit to the demonstrations site to resolve problem on spot.
- Each KVK will furnish cafeteria of interventions for each crop to be undertaken at the demonstration site.
- For individual farmer, FLDs should not exceed than 0.80ha.
- The qualification and salary of Senior Research Fellow and Data Entry Operator is admissible as per the approved norms of the ICAR/University.
- One SRF is allowed at ICAR, headquarter, New Delhi.
- Travelling Allowance and Daily Allowance is admissible as per norms of Govt. of India.
- The organizational of workshop cum training and group meetings should be organized as per norms of ICAR.
- The list of beneficiary-farmers should be maintained at each ATARI level.
- The contribution of individual intervention should also be documented.
- KVKs which shall conduct FLDs in 100 ha or more area during both the cropping season of a year is allowed to hire PTA for 12 months and KVK which shall conduct FLDs in at least 50 ha or more area either in Kharif, Rabi and summer season is allowed PTA for six months.
- Each KVK should try to choose interior areas; farmers have generally been deprived of demonstrations conducted by extension agencies.
- KVK should focus on use of micro-nutrients, soil ameliorants and IPM practices.
- Farmers should be trained for seed production, primary processing etc.
- Each ATARI designated for a particular zone will prepare a detailed report on the demonstrations of pulses and a final report will be submitted by Department of Agricultural Extension-ICAR, New Delhi.

(Dr. O. P. Malik)

Additional Commissioner (Crops)

Copy to:

1. Director General, ICAR, Krishi Bhawan, New Delhi
2. Deputy Director General (CS), Krishi Bhawan, New Delhi
3. Deputy Director General, Division of Agriculture Extension, ICAR, New Delhi.

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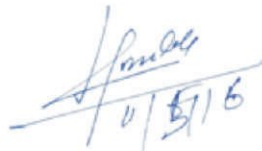


-3-

4. Director, Agricultural Technology Application Research Institute Zone-I, Ludhiana, Punjab.
5. Agricultural Technology Application Research Institute, Zone-II, Kolkata, West Bengal.
6. Director, Agricultural Technology Application Research Zone-III Umiam (Barapani) Meghalaya.
7. Director, Agricultural Technology Application Research Institute Zone-IV, Kanpur, Uttar Pradesh.
8. Agricultural Technology Application Research Institute, Zone-V, Hyderabad, Andhra Pradesh.
9. Director, Agricultural Technology Application Research Institute, Zone-VI, Jodhpur, Rajasthan.
10. Director, Agricultural Technology Application Research Institute Zone-VII, Jabalpur, Madhya Pradesh.
11. Director, Agricultural Technology Application Research Institute Zone-VIII, Bengaluru, Karnataka.
12. Director of Agriculture, Government of Assam, Arunachal Pradesh, Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Himachal Pradesh, Jharkhand, J&K, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Meghalaya, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Telangana, Tripura, Uttar Pradesh, Uttarakhand and West Bengal.
13. Director, Crops Development Directorate, DWD-Ghaziabad, DJD-Kolkata, DSD-Lucknow, DOD- Hyderabad, DMD-Jaipur, DPD-Bhopal, DCD-Nagpur and DRD Patna.

Copy also to:-

1. Under Secretary (Finance), DAC&FW, Krishi Bhavan, New Delhi.
2. Under Secretary (CA-V), DAC&FW, Krishi Bhavan, New Delhi.
3. Sr. PPS to Secretary (AC&FW), Krishi Bhavan, New Delhi.
4. Sr. PS to Agriculture Commissioner, DAC&FW, Krishi Bhavan, New Delhi.
5. PS to JS (Crops), DAC&FW, Krishi Bhavan, New Delhi.
6. PS to Director (Crops), DAC&FW, Krishi Bhavan, New Delhi.
7. PS to Additional Commissioner (Crops), Krishi Bhavan, New Delhi.
8. Deputy Commissioner (Crops)/Consultants, NFSM/AD/STA (Crops), Krishi Bhavan, New Delhi.
9. Programmer NFSM.


01/5/16



S.No.	Crops	State	No. of KVKs	No. of Demonstration	Area (in ha)	Budget (in Rs.)
Kharif Season						
1	Black Gram	Punjab	1	50	20	150000
		Himachal Pradesh	5	200	80	600000
		Jammu & Kashmir	2	100	40	300000
2	Green Gram	Punjab	2	150	60	450000
		Haryana	2	100	40	300000
		Jammu & Kashmir	1	25	10	75000
3	Pigeonpea	Punjab	1	50	20	150000
4	Rajmash	Jammu & Kashmir	5	225	90	675000
Total Kharif Season				900	360	2700000
Rabi Season						
1	Chickpea	Punjab	11	575	230	1725000
		Haryana	5	325	130	975000
		Himachal Pradesh	2	100	40	300000
		Jammu&Kashmir	1	50	20	150000
2	Lentil	Punjab	1	50	20	150000
		Haryana	1	50	20	150000
3	Fieldpea	Jammu&Kashmir	2	75	30	225000
Total Rabi Season				1225	490	3675000
Summer Season						
1	Summer Moong	Punjab	10	550	220	1650000
		Haryana	14	850	340	2550000
2	Black Gram	Punjab	3	150	60	450000
3	Rajmash	Himachal Pradesh	1	25	10	75000
Total Summer				1575	630	4725000
Total(Kharif+Rabi+Summer)				3700	1480	11100000
1	Organization of one Zonal Workshop cum training @ Rs 100000/-					100000
2	Organization of Two Group Meeting @ Rs 50000/-					100000
3	One Senior Research Fellow(SRF) @ Rs 25000 +HRA@20% for twelve months.					360000
4	One Data entry operator (DEO) at ATARI @ Rs 15000(consolidated)per month for twelve month.					180000
5	Miscellaneous expenditure on account of printing of reports etc @40000/for each ATARI.					40000
6	One Technology Agent at 8 KVKs @ Rs 10000(consolidated) for Six month					480000
Grand Total						123,60,000



State-wise details of area proposed for CFLDs on Pulses (Kharif, Rabi and summer) 2016-17
Punjab

S. No.	Name of KVK / District	Kharif Pulses (Area in ha)			Rabi Pulses (Area in ha)		Summer Pulses (Area in ha)		Total Area
		Black Gram	Green Gram	Pigeon pea	Chick pea	Lentil	Summer /Greengram	Moong Black gram	
1	Amritsar				30			20	50
2	Barnala						20		20
3	Bathinda				20		30		50
4	Faridkot				20				20
5	Fatehgarh Sahib				20		20		40
6	Ferozepur		20		20		30		70
7	Gurdaspur				20			20	40
8	Hoshiarpur				20	20			40
9	Ludhiana						20		20
10	Mansa			20			20		40
11	Moga						20		20
12	Muktsar						20		20
13	Nawanshahar	20			20				40
14	Patiala				20		20		40
15	Ropar							20	20
16	Sangrur				20		20		40
17	Tarn Taran		40		20				60
	Total	20	60	20	230	20	220	60	630

Haryana

S. No.	Name of KVK / District	Kharif Pulses (Area in ha)			Rabi Pulses (Area in ha)		Summer Pulses (Area in ha)		Total Area
		Black Gram	Green Gram	Pigeon pea	Chick pea	Lentil	Summer /Greengram	Moong Black gram	
1	Ambala				30		20		50
2	Bhiwani		20		30		20		70
3	Fatehabad						20		20
4	Hisar				30		20		50
5	Jind						20		20
6	Kaithal						20		20
7	Karnal				20		20		40
8	Kurukshetra						30		30



S. No.	Name of KVK / District	Kharif Pulses (Area in ha)			Rabi Pulses (Area in ha)		Summer Pulses (Area in ha)		Total Area
		Black Gram	Green Gram	Pigeon pea	Chick pea	Lentil	Summer Moong /Greengram	Black gram	
9	Mahendergarh		20		20				40
10	Panipat						20		20
11	Rewari						20		20
12	Rohtak						30		30
13	Sirsa						20		20
14	Yamunanagar					20	30		50
15	Sonipat						50		50
	Total	0	40	0	130	20	340	0	530

Himachal Pradesh

S. No.	Name of KVK / District	Kharif Pulses (Area in ha)			Rabi Pulses (Area in ha)		Summer Pulses (Area in ha)		Total Area
		Black Gram	Green Gram	Pigeon pea	Chick pea	Lentil	Rajmash	Summer Blackgram	
1	Bilaspur	20			20				40
2	Hamirpur	10							10
3	Kinnaur	0					10		10
4	Kullu	20							20
5	Mandi	20			20				40
6	Shimla	10							10
	Total	80	0	0	40	0	10	0	130

Jammu & Kashmir

S. No.	Name of KVK / District	Kharif Pulses (Area in ha)			Rabi Pulses (Area in ha)		Summer Pulses (Area in ha)		Total Area
		Rajmash	Green Gram	Black gram	Chick pea	Field pea	Rajmash	Summer Blackgram	
1	Anantnag	20							20
2	Budgam		10						10
3	Jammu				20				20
4	Kathua			20					20
6	Kupwara	20							20
7	Leh (Additional)					10			10
8	Poonch	20							20
9	Pulwama	20				20			40
10	Rajouri			20					20
11	Reasi	10							10
	Total	90	10	40	20	30	0	0	190



Reallocation of FLD

Annexure II

Reallocation of deficit Kharif season 2016-17

State	Crops	Name of the KVKs	FLDs	
			Number	Area (ha)
Punjab	Summer moong	Ferozepur	50	20
		Tarntaran	100	40
		Moga	50	20
		Ludhiana	25	10
Total			225	90
Haryana	Chickpea	Mahendargarh	50	20
		Rewari	25	10
Total			75	30
Himachal Pradesh	Chickpea	Hamirpur	9	3.3
		Shimla	13	5
		Una	25	10
Total			47	18.3
Jammu & Kashmir	Chickpea	Rajouri	35	14
		Reasi	15	6
	Field pea	Anantnag	34	13.5
		Pulwama	38	15
Total (Chickpea)			50	20
Total (Field pea)			72	28.5
Total (Jammu & Kashmir)			122	48.5
Grand Total			439	186.8

Annexure III

Reallocation of deficit Rabi season 2016-17

State	Crops	Name of the KVKs	FLDs	
			No.	Area (ha)
Punjab	Summer moong	Hoshiarpur	15	6
		Tarn Taran	50	20
		Kapurthala	50	20
		Faridkot	50	20
		Jalandhar	25	10
Total			190	76
Himachal Pradesh	Summer moong	Una	25	10
Total			25	10
Jammu & Kashmir	Summer mash	Jammu	9	3.5
Total			9	3.5
Grand Total			224	89.5

B:C ratio of the demonstrations during Kharif season 2016-17 Kharif season 2016-17

Annexure III

KVK	Crop	Economics of Local Check (Rs./ha)			Economics of Demonstration (Rs./ha)				
		Gross Cost	Gross return	Net return	BC ratio	Gross Cost	Gross return	Net Return	BC ratio
Nawanshahr	Blackgram	13500	45000	31500	3.3	14000	55000	34000	3.9
Mansa	Arhar	17000	37500	20500	2.2	17200	22500	5300	1.3
Bhiwani	Greegram	26520	35500	8980	1.3	27189	61500	34311	2.3
Mahendargarh	Greegram	17000	28000	11000	1.6	18310	34000	15690	1.9
Bilaspur	Blackgram	21600	61000	39399	2.8	27272	109000	81724	4.0
Hamirpur	Blackgram	20600	38720	18120	1.9	22800	50480	27680	2.2
Kullu	Blackgram	19670	64300	44630	3.3	20310	71100	50790	3.5
Mandi	Blackgram	24800	45900	22400	1.9	26250	57105	30855	2.2
Shimla	Blackgram	12700	62000	49300	4.9	10500	96000	85500	9.1
Kathua	Blackgram	11500	57750	46250	5.0	11500	99000	87500	8.6
Rajouri	Blackgram	29000	43500	14500	1.5	29000	56985	27985	2.0
Reasi	Blackgram	11800	32200	20,400	2.7	12200	42500	30300	3.5
Anantnag	Rajmash	45335	91125	45790	2.0	51345	116910	65565	2.3

Rabi season lentil 2016-17

State	KVK	Economics of Local Check (Rs./ha)			Economics of Demonstration (Rs./ha)				
		Gross Cost	Gross return	Net return	BC ratio	Gross Cost	Gross return	Net Return	BC ratio
Punjab	Hoshiarpur	22150	20417	-1732	0.9	25050	27357	2307	1.1
Haryana	Yamunanagar	25720	70000	44280	2.7	27740	90020	62280	3.2



Rabi season chickpea 2016-17



KVK	Economics of Local Check (Rs./ha)			Economics of Demonstration (Rs./ha)		
	Gross Cost	Gross return	BC ratio	Gross Cost	Gross return	BC ratio
Amritsar	24230	42560	1.8	27456	49560	1.8
Bathinda	22500	62700	2.8	22500	65360	2.9
Faridkot	25650	49950	1.9	26450	70300	2.7
Fatehgarh sahib	14905	58840	3.9	12905	71400	5.5
Ferozepur	13800	32500	2.4	14200	38300	2.7
Gurdaspur	73150	31892	0.4	81900.5	27546	0.3
Hoshiarpur	28550	24827	0.9	31180	32342	1.0
Nawanshahar	26550	61875	2.3	26550	96250	3.6
Patiala	33500	40250	1.2	33000	55475	1.7
Sangrur	26968	62500	2.3	29514	226400	7.7
Ambala	43820	54400	1.2	49980	99000	2.0
Karnal	20447	74100	3.6	22522	90000	4.0
Bhiwani	43820	54400	1.2	49980	99000	2.0
Hisar	18000	70850	3.9	19680	82895	4.2
Mahendergarh	27820	91550	3.3	29260	107940	3.7
Rewari	24250	61250	2.5	26100	73822	2.8
Bilaspur	20744	52866	2.5	22389	69066.6	3.1
Mandi	33500	45200	1.3	36994	58166	1.6
Hamirpur	24500	46400	1.9	26800	52560	2.0
Una	18700	29975	1.6	18700	43101	2.3
Shimla	9300	16988	1.8	7917	19880	2.5
Jammu	29400	61200	2.1	30000	68400	2.3
Rajouri	16000	36000	2.3	16000	46800	2.9
Reasi	8730	29300	3.4	9320	41700	4.5

BC ratio = (Gross return-Gross Cost)/Gross Cost

Details of cultivar of Pulses used for conducting CFLDs on Pulses

Annexure IV

Crop	Variety	Variety releasing organization	Year of releases	Areas of adaptation Zone/State	Potential yield (q/ha)	Days to maturity	Remarks
Blackgram	Mash 114	PAU, Ludhiana	2008	Whole of Punjab State	9	83	Fairly resistant to YMV and <i>Cercospora</i> leaf spot diseases
	Pant U-19	GBPUAT	1982	NEPZ	8-10	85	Resistant to YMV
	PU-31	GBPUAT	2005	Uttarakhand and H.P.	10	75	Resistant to YMV
	UG 218	Hisar, HAU	1983	Himachal Pradesh	12.0	81	Re-notified for FLD
	Himachal Mash 1	CSK HPKV Palampur	2010	Himachal Pradesh (Low & mid hills)	14.0	75	-
	Palampur 93	CSK HPKV Palampur	1999	Himachal Pradesh	11.0-12.0	85-90	Suitable for areas 1500 Mean above sea level
Pigeon pea	AL 201	PAU, Ludhiana	1993	Whole of Punjab State	15.5	140	Indeterminate growth habit. Plants are erect.
	MH 421	CCSHAU, Hisar	2012	Haryana	12.00	60	Non-shattering, resistant to YMV, suitable for kharif, spring & summer
Chickpea	PBG-7	PAU, Ludhiana	2014	Punjab	20.00	159	Fairly resistant to wilt
	PBG-5	PAU, Ludhiana	2002	Punjab	19.00	165	Tolerant to <i>Ascochyta</i> blight.
	GPF 2	PAU, Ludhiana	1995	NWPZ*	21-23	152	Resistant to wilt and tolerant to <i>Ascochyta</i> blight.
	GNG-1581	ARS, Sriganaganagar	2008	NWPZ	23.68	127-177	Tolerance against <i>Ascochyta</i> blight and root rot
	Haryana channa (HC 1)	CCS HAU, Hisar	1990	NWPZ	22-23	145-150	For late sowing and wilt resistant





Crop	Variety	Variety releasing organization	Year of releases	Areas of adaptation Zone/State	Potential yield (q/ha)	Days to maturity	Remarks
Chickpea	Haryana channa (HC 5)	CCS HAU, Hisar	2004	Haryana	24.00	155	Resistant to wilt and root diseases
	Himachal channa-1	CSK HPKV Palampur	1999	All the chickpea growing areas of H.P.	11.00	190-200	It is resistant to gram blast disease
	Himachal channa-2	CSKHPKV Palampur	2006	Himachal Pradesh	12.00	185-190	Resistant to wilt, moderately resistant to root rot & collar rots, tolerant to Ascochyta blight
Lentil	LL-699	PAU, Ludhiana	2001	Punjab	14-15	145	Tolerant to rust and blight

* North Western Plain Zone (NWPZ)

**Format for Progress Report
Cluster Frontline Demonstrations on Pulses under NFSM 2016-17**

Annexure V

I. General Information

1	Name of the KVK	
2	Year of establishment	
3	Host Institution	
4	Address for communication including phone and fax numbers	
5	District	
6	State	

II. Cluster FLDs on pulses under NFSM

1	Name of the crop	
2	Season and year	
3	No. of FLDs (farmers) sanctioned	
4	No. of FLDs (farmers) conducted	
5	Area (ha) sanctioned	
6	Area (ha) actually conducted	
7	Sanctioned budget (Rs.)	
8	Budget received actually (Rs.)	
9	Actual expenditure (Rs.)	
10	Balance amount (Rs.)	
11	FLDs implemented in how many clusters ?	
12	No. of villages and farmers in each cluster	
13	Land situation (irrigated, rainfed, others specify)	
14	Name of variety/varieties demonstrated	
15	Technologies/package of practices demonstrated in each cluster	





16	Sowing date/dates as per clusters	
17	Number of field operations taken so far like manuring, weeding, irrigation etc. and name them with approximate date/week	
18	Stage of the crop	
19	Expected harvesting date/dates as per clusters	

III. Details on cluster FLD farmers

Sl. No.	Name of cluster FLD farmer	Category (Gen/OBC/SC/ST)	Land Area (ha)	Cluster number	Village	Block	Taluq

III. Details on cluster FLD farmers

Sl. No.	Name of cluster FLD farmer	Category (Gen/OBC/SC/ST)	Land Area (ha)	Cluster number	Village	Block	Taluq

IV. Critical inputs provided for demonstration

Sl. No.	Critical inputs	Name of critical input	Quantity	Value (Rs.)	No. of farmers	No. of villages	No. of clusters
1	Seeds (name variety)						
2	Fertilizers (Organic and inorganic)						
3	Micro-nutrients						
4	Weedicides, Pesticides, Fungicides etc.						
5	Bio-agents						
6	Bio-products						
7	Nutrient complex/nutrient special						

V. Training programmes organized

Sl. No.	Date	Type of training (on/off campus)	Title of training programme	Participant farmers (general)-A			Participant farmers (SC/ST)-B			Total participants (A+B)		
				Men	Women	Total	Men	Women	Total	Men	Women	Total



V. Training programmes organized



Sl.No.	Date	Name of extension activity	Participant farmers			Participant extension personnel		
			Men	Women	Total	Men	Women	Total

VII. Performance (results) of the demonstrations

(A) General information

Name of the crop	Demos (No.)	Variety		National average yield (q/ha)	State average yield (q/ha)	District average yield (q/ha)	Characteristics of the demo variety	Potential yield of the demo variety (q/ha)	Yield gap – I (%)	Yield gap – II (%)
		Check	Demo							

Formula for calculating yield gap percentage:

Yield gap – I (%) = $\frac{\text{Potential yield} - \text{Demo yield}}{\text{Potential yield}} \times 100$
Yield gap – II (%) = $\frac{\text{Demo yield} - \text{Check yield}}{\text{Demo yield}} \times 100$

(B) Yield and net returns

Yield obtained (q/ha)			Expenditure and returns (Rs./ha)				Yield increase (%)		Net returns increase (%)					
Check		Demo	Check		Demo		Check		Demo		Check		Demo	
Max.	Av.	Min.	Gross Cost (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross Cost (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio	Gross return (Rs/ha)	Net Return (Rs/ha)	B:C ratio

(C) Results on specific technologies other than variety

Crop	Specific technology demonstrated	Recommendation/ha	Observations taken	Results	Remarks/feed-back

(D) Socio-economic impact parameters



Sl. No.	Parameters	Crop-1	Crop-2	Crop3
1	Name of the crop			
2	Variety			
	No. of clusters			
3	No. of farmers			
4	Total area (ha)			
5	Yield obtained (q/ha)			
6	Total Produce Obtained (q)			
7	Produce sold (q/cluster)			
8	Selling price (Rs./q)			
9	Produce retained as seed purpose (q/cluster)			
10	Produce distributed/sold to other farmers as seed (q/cluster)			
11	Employment Generated (Man days/cluster)			
12	Purpose for which income gained was utilized by the faremrs			

(E) Farmer's perception of the intervention demonstrated

Technology attributes	FARMERS PERCEPTION															
	Variety			Technology -1			Technology -2			Technology -3			Technology -4			
	High	Mode rate	Low	High	Mode rate	Low	High	Mode rate	Low	High	Mode rate	Low	High	Mode rate	Low	
Problem solving																
Understandability																
Practicability																
Cost effectiveness																
Profitability																
Sustainability																
Compatibility																
Accessibility																
Acceptability																
Preference																



VIII. Observations and feed-back

- (a) Observations by Scientist(s) from KVK
- (b) Farmers opinion/feed-back

IX. Visitors to cluster FLDs/study tours etc.

X. Quality photographs for all activities to be submitted along with this format

Release of funds for conducting CFLDs during 2016-17

Annexure VI

Name of KVK	Crop	Fld Sanctioned in acre	Total Amount sanctioned @3000/- per acre	Less Monitoring @5% for ATARL, Ludhiana	Amount sanctioned for KVKs after deduction of 5% monitoring	Opening Balance available with KVK	Already released may be adjusted against amount of summermoong	Now Release	Total Release including opening balance	Release including monitoring and opening balance
Amritsar	Chickpea	75	225000	11250	213750	34	0	213716	213750	225000
Amritsar	Summer mash	50	150000	7500	142500	0	0	142500	142500	150000
Bathinda	Chickpea	50	150000	7500	142500	13640	0	128860	142500	150000
Bathinda	Summer moong	75	225000	11250	213750	0	0	213750	213750	225000
Faridkot	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Faridkot	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Fatehgarh sahib	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Fatehgarh Sahib	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Ferozepur	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Ferozepur	Summer moong	125	375000	18750	356250	0	0	356250	356250	375000
Gurdaspur	Chickpea	50	150000	7500	142500	66398	0	76102	142500	150000
Gurdaspur	Summer mash	50	150000	7500	142500	0	0	142500	142500	150000
Hoshiarpur	Chickpea	50	150000	7500	142500	58	0	142442	142500	150000
Hoshiarpur	Lentil	50	150000	7500	142500	0	0	142500	142500	150000
Hoshiarpur	Summer moong	15	45000	2250	42750	0	0	42750	42750	45000
Jalandhar	Summer moong	25	75000	3750	71250	787	0	70463	71250	75000
Kapurthala	Summer moong	50	150000	7500	142500	92	0	142408	142500	150000
Ludhiana	Summer moong	75	225000	11250	213750	779	0	212971	213750	225000
Mansa	Pigeon pea	50	150000	7500	142500	0	0	142500	142500	150000
Mansa	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Moga	Summer moong	100	300000	15000	285000	0	0	285000	285000	300000
Muktsar	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Nawanshahar	Black gram	50	150000	7500	142500	7	0	142493	142500	150000
Nawanshahar	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Patiala	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000





Name of KVK	Crop	Fld Sanctioned in acre	Total Amount sanctioned @3000/- per acre	Less Monitoring @5% for ATARI, Ludhiana	Amount sanctioned for KVKs after deduction of 5% monitoring	Opening Balance available with KVK	Already released may be adjusted against amount of summermoong	Now Release	Total Release including opening balance	Release including monitoring and opening balance
Patiala	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Ropar	Summer mash	50	150000	7500	142500	95	0	142405	142500	150000
Sangrur	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Sangrur	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
PAU Total		1590	4770000	238500	4531500	81890	0	4449610	4531500	4770000
Barnala	Summer moong	50	150000	7500	142500	103496	0	39004	142500	150000
Tarn Taran	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Tarantaran	Summer moong	150	450000	22500	427500	0	142500	285000	427500	450000
GADVASU, Total		250	7500000	375000	7125000	103496	142500	466504	712500	7500000
Ambala	Chickpea	75	225000	11250	213750	122111	0	91639	213750	225000
Ambala	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Ambala (Total)		125	3750000	187500	3562500	122111	0	234139	3562500	3750000
Rewari	Chickpea	25	75000	3750	71250	106379	0	0	106379	110129
Rewari	Summer moong	25	75000	3750	71250	35129	0	36121	71250	75000
Rewari (Total)		50	1500000	75000	1425000	141508	0	36121	177629	185129
Karnal	Chickpea	50	150000	7500	142500	163100	0	0	0	0
Karnal	Summer moong	50	150000	7500	142500	177000	0	0	0	0
Karnal (Total)		100	3000000	150000	2850000	340100	0	0	0	0
Bhiwani	Greengram	50	150000	7500	142500	0	0	142500	142500	150000
Bhiwani	Chickpea	75	225000	11250	213750	188800	0	24950	24950	24950
Bhiwani	Summer moong	50	150000	7500	142500	0	0	142500	142500	150000
Hisar	Chickpea	75	225000	11250	213750	95400	0	118350	118350	118350
Hisar	Summer moong	50	150000	7500	142500	69000	0	73500	73500	73500
Kaithal	Summer moong	50	150000	7500	142500	71000	0	71500	71500	71500
Mahendergarh	Chickpea	50	150000	7500	142500	93925	0	48575	142500	150000
Mahendergarh	Greengram	50	150000	7500	142500	0	0	142500	142500	150000
Mahendergarh	Chickpea	100	300000	15000	285000	93925	0	191075	191075	191075



Name of KVK	Crop	Field Sanctioned in acre	Total Amount sanctioned @3000/- per acre	Less Monitoring @5% for ATARI, Ludhiana	Amount sanctioned for KVKs after deduction of 5% monitoring	Opening Balance available with KVK	Already released may be adjusted against amount of summermoong	Now Release	Total Release including opening balance	Release including monitoring and opening balance
Panipat	Summer moong	50	150000	7500	142500	0		142500		
Rohtak	Summer moong	75	225000	11250	213750	88500		125250		
Sirsa	Summer moong	50	150000	7500	142500	107900		34600		
Sonipat	Summer moong	125	375000	18750	356250	0		356250		
Yamunanagar	Summer moong	75	225000	11250	213750	50000		163750		
Yamunanagar	Lentil	50	150000	7500	142500	110600		31900		
CCHAU, Haryana (Total)		975	2925000	146250	2778750	969050	0	1809700	142500	150000
Jammu	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Jammu	Summermoong	8.75	26250	1313	24937	0	0	24937	24937	26250
Kathua	Blackgram	50	150000	7500	142500	39060	0	103440	142500	150000
Rajouri	Chickpea	35	105000	5250	99750	0	0	99750	99750	105000
Rajouri	Blackgram	15	45000	2250	42750	30260	0	12490	42750	45000
Reasi	Blackgram	10	30000	1500	28500	0	0	28500	28500	30000
Reasi	Chickpea	15	45000	2250	42750	0	0	42750	42750	45000
SKUAST, Jammu (Total)		183.75	551250	27563	523687	69320	0	454367	523687	551250
Anantnag	Rajmash	16.63	49890	2495	47395	0	0	47395	47395	49890
Anantnag	Fieldpea	33.75	101250	5063	96187	0	0	96187	96187	101250
Budgam	Greengram	25	75000	3750	71250	0	0	71250	71250	75000
Leh(Additional)	Fieldpea	25	75000	3750	71250	0	0	71250	71250	75000
Pulwama	Rajmash	12.5	37500	1875	35625	8270	0	27355	35625	37500
SKUAST, Srinagar (Total)		112.88	338640	16933	321707	8270	0	313437	321707	338640
Bilaspur	Blackgram	50	150000	7500	142500	143551	0	0	143551	151051
Bilaspur	Chickpea	50	150000	7500	142500	1051	0	141449	142500	150000
Hamirpur	Blackgram	15	45000	2250	42750	50080	0	0	50080	52330
Hamirpur	Chickpea	8.25	24750	1238	23512	7330	0	16182	23512	24750



Name of KVK	Crop	Fld Sanctioned in acre	Total Amount sanctioned @3000/- per acre	Less Monitoring @5% for ATARI, Ludhiana	Amount sanctioned for KVKs after deduction of 5% monitoring	Opening Balance available with KVK	Already released may be adjusted against amount of summermoong	Now Release	Total Release including opening balance	Release including monitoring and opening balance
Kullu	Blackgram	12.5	37500	1875	35625	0	0	35625	35625	37500
Mandi	Blackgram	50	150000	7500	142500	594	0	141906	142500	150000
Mandi	Chickpea	50	150000	7500	142500	0	0	142500	142500	150000
Una	Chickpea	25	75000	3750	71250	108233	0	0	108233	111983
Una	Summermoong	25	75000	3750	71250	36983	0	34267	71250	75000
CSKHPKV, Palampur		285.75	857250	42863	814387	347822	0	511929	859751	902614
Kimnaur	Rajmash	25	75000	3750	71250	0	0	71250	71250	75000
Shimla	Blackgram	12.5	37500	1875	35625	81772	0	0	81772	83647
Shimla	Chickpea	12.5	37500	1875	35625	46147	0	0	46147	48022
Dr. YSPUH&F, Solan		50	150000	7500	142500	127919	0	71250	199169	206669
G. Total		3722.38	11167140	558359	10608781	2311486	142500	8347057	7824693	8229302

Release for PTA during 2016-17

Sl. No.	Name of KVK	No Of Pulse Technology Agent	Duration For Hiring	Amount sanctioned per month	Amount in Rupees	
					Total Amount Released	Amount Released
1	Ambala	1	5 months	10000	50000	50000
2	Bathinda	1	4 months	10000	40000	40000
3	Ferozepur	1	4 months	10000	40000	40000
4	Bhiwani	1	4 months	10000	40000	40000
	Total				1,70,000	1,70,000



ATARI-Wise & Crop-wise Summary for conducting cluster demonstration of pulses by KVKs along with area and proposed budget for 2017-18

ATARI-I, Ludhiana

S.N o.	Crops	State	No. of KVKs involved in Cluster Demonstration		No. of Demonstration	Area (in ha)	Budget (in Rs.)
			Unique KVKs	KVKs repeated			
1	2	3	4	5	6	7	8
1. Kharif Season							
1	Black Gram	Punjab	1	0	25	10	75000
		Himachal Pradesh	8	0	250	100	750000
		Jammu & Kashmir	4	0	100	40	300000
		Uttarakhand	8	0	200	80	600000
2	Green Gram	Punjab	3	0	100	40	300000
		Himachal Pradesh	0	1	50	20	150000
		Jammu & Kashmir	2	0	50	20	150000
		Uttarakhand	0	2	50	20	150000
3	Fieldpea	Jammu & Kashmir	1	0	25	10	75000
4	Rajmash	Jammu & Kashmir	4	3	225	90	675000
5	Horsegram	Uttarakhand	2	1	55	22	165000
Total Kharif Season			33		1130	452	3390000
2. Rabi Season							
1	Chickpea	Punjab	9	4	600	240	1800000
		Himachal Pradesh	0	5	175	70	525000
		Jammu & Kashmir	0	2	50	20	150000
2	Fieldpea	Punjab	0	1	25	10	75000
		Jammu & Kashmir	0	5	125	50	375000
3	Lentil	Punjab	1	2	125	50	375000
		Himachal Pradesh	0	1	25	10	75000
		Uttarakhand	2	10	350	140	1050000
Total Rabi Season			12		1475	590	4425000
3. Summer Season							
1	Green Gram	Punjab	7	12	1100	440	3300000
2	Black Gram	Punjab	0	3	100	40	300000
Total Summer			7		1200	480	3600000
Total(Kharif+Rabi+Summer)			52		3805	1522	11415000
4	Organization of one Zonal Workshop cum training @ Rs 90000/-						90000
5	Organization of One Group Meeting @ Rs 50000/-						50000
6	One Senior Research Fellow(SRF) @ Rs 25000 +HRA@20% for twelve months.						360000
7	One Data entry operator (DEO) at ATARI @ Rs 15000(consolidated)per month for twelve month.						180000
8	Miscellaneous expenditure on account of printing of reports etc @40000/for each ATARI.						31000
9	One Pulses Technology Agent each at 7 KVKs@ Rs 10000/- consolidated per month for six month						420000
10	Incentive for one Zonal Pulses Felloe Award at ATARI level @ Rs.50,000 to incentivises to scientists for promotion of Pulses in their district						50000
Total (4 to 10)							1181000
Grand Total							125,96,000



State-wise details of area proposed for CFLDs on Pulses (Kharif/Rabi/Summer) during 2017-18 ATARI-I, Ludhiana

State:- Punjab

S.No.	Name of KVKs	Kharif Pulses		Rabi Pulses			Summer Pulses		Total Area in ha	Total Demo
		Black gram	Green gram	Chick pea	Field Pea	Lentil	Green gram	Black gram		
1	KVK Faridkot	0	0	20	0	0	20	0	40	100
2	KVK Gurudaspur	0	0	10	0	10	10	0	30	75
3	KVK Ferozpur	0	20	20	0	0	30	0	70	175
4	KVK Bathinda	0	0	30	0	0	30	0	60	150
5	KVK Hoshiarpur	10	0	10	0	0	10	10	40	100
6	KVK Patiala	0	0	20	0	0	30	0	50	125
7	KVK Kapurthala	0	0	0	0	0	20	0	20	50
8	KVK Sangrur	0	0	10	0	0	10	0	20	50
9	KVK Nawashahar	0	0	20	0	0	10	20	50	125
10	KVK Ropar	0	0	0	0	20	0	10	30	75
11	KVK Ludhiana	0	0	0	0	0	30	0	30	75
12	KVK Amritsar	0	0	20	0	0	20	0	40	100
13	KVK Muktsar	0	0	0	0	0	30	0	30	75
14	KVK Fatehgarh Shahib	0	0	20	0	20	20	0	60	150
15	KVK Moga	0	0	0	0	0	20	0	20	50
16	KVK Jalandhar	0	0	0	0	0	20	0	20	50
17	KVK Mansa	0	0	0	0	0	20	0	20	50
18	KVK Mohali	0	20	20	0	0	30	0	70	175
19	KVK Taran Taran	0	0	0	0	0	40	0	40	100
20	KVK Barnala	0	0	20	10	0	20	0	50	125
21	KVK Fazilka	0	0	20	0	0	20	0	40	100
Total		10	40	240	10	50	440	40	830	2075

State:-Himachal Pradesh

S.No.	Name of KVKs	Kharif Pulses		Rabi Pulses		Total Area in ha	Total Demo
		Blackgram	Greengram	Chickpea	Lentil		
1	KVK Kullu	10	0	0	0	10	25
2	KVK Una	10	20	10	0	40	100
3	KVK Mandi	20	0	20	0	40	100
4	KVK Sirmaur	10	0	10	10	30	75
5	KVK Hamirpur	10	0	0	0	10	25
6	KVK Bilaspur	20	0	20	0	40	100
7	KVK Chamba	10	0	0	0	10	25
8	KVK Shimla	10	0	10	0	20	50
Total		100	20	70	10	200	500



State: Jammu & Kashmir

S.No.	Name of KVKs	Kharif Pulses				Rabi Pulses		Total Area in ha	Total Demo
		Black gram	Green gram	Field Pea	Rajmash	Chick pea	Field pea		
1	KVK Jammu	10	0	0	0	10	0	20	50
2	KVK Rajouri	10	0	0	0	0	0	10	25
3	KVK Doda	10	0	0	0	0	0	10	25
4	KVK Poonch	0	0	0	10	0	0	10	25
5	KVK Pulwama	0	10	0	10	0	10	30	75
6	KVK Baramula	0	0	0	30	0	0	30	75
7	KVK Kupwara	0	0	10	10	0	10	30	75
8	KVK Shopian	0	0	0	10	0	10	20	50
9	KVK Anantnag	0	10	0	10	0	10	30	75
10	KVK Reasi	10	0	0	0	10	0	20	50
11	KVK Bondipora	0	0	0	10	0	10	20	50
Total		40	20	10	90	20	50	230	575

State:- Uttarakhand

S.No.	Name of KVKs	Kharif Pulses			Rabi Pulses	Total Area in ha	Total Demo
		Blackgram	Greengram	Horsegram	Lentil		
1	KVK Champawat	10	0	10	10	30	75
2	KVK Tehri Garhwal	10	0	0	10	20	50
3	KVK Nainital	10	10	0	20	40	100
4	KVK Chamoli	10	0	0	10	20	50
5	KVK Haridwar	10	0	0	10	20	50
6	KVK Almora	0	0	10	10	20	50
7	KVK Pauri Garhwal	0	0	0	10	10	25
8	KVK Udhamnagar	10	0	0	20	30	75
9	KVK Pithoragarh	10	0	0	10	20	50
10	KVK Dehradun	10	10	0	10	30	75
11	KVK Uttarakshi	0	0	0	10	10	25
12	KVK Bageshwar	0	0	2	10	12	30
Total		80	20	22	140	262	655



Annexure VII

Contributors of the KVKs under CFLDs on Pulses 2016-17

State	Programme Coordinator	CFLDs incharge
Punjab		
Amritsar	Dr. Bhupinder Singh Dhillon	Dr. Jagmohan singh
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Fatehgarh Sahib	Dr. Vipam Kumar Rampal	Mrs. Reet Verma and Dr. Arvind Preet Kaur
Ferozepur	Dr. Gurjant Singh Aulakh	Dr. Pardeep Kumar
Gurdaspur	Dr. (Mrs.) Parminder Kaur	Dr. Satwinderjit Kaur
Hoshiarpur	Dr. Maninder Singh Bons	Er. Ajaib Singh, Dr. Ajay Singh, Dr. Dhram Parkash
Mansa	Dr. Gurjinder Pal Singh	Dr. Gurdeep Singh
Nawanshehr	Dr. Jugraj Singh	Dr. Navjot Singh, Dr. Manpreet Singh
Patiala	Dr. Jasvinder Singh	Dr. Rachna Singla
Sangrur	Dr. Mandeep Singh	Mr. Ashok Kumar
Haryana		
Ambala	Dr. Upasana Singh	Dr. Rakesh Choudhary
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Karnal	Dr. Dalip K Gosain	Dr. Mohar Singh
Mahendargarh	Dr. SS Yadav	Dr. Ramesh Kumar and Dr. Jai Lal Yadav
Rewari	Dr. Kapur Singh	Mr. Rajkumar
Yamunanagar	Dr. BR Kamboj	Dr. BR Kamboj
Hisar	Dr. Sunil Kumar Dhanda	
Himachal Pradesh		
Bilaspur	Dr. Jai Dev	Dr. Sanjay Kumar
Hamirpur	Dr. S. K. Upadhyay	Dr. Dhanbir Singh
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Una	Dr. AR Khan	Dr. Sanjay Kumar Sharma
Kullu	Dr. KC Sharma	Dr. RK Rana
Mandi	Dr. Pankaj Sood	Dr. DS Yadav, Dr. LK Sharma and Dr. Subash Kumar
Jammu & Kashmir		
Kathua	Dr. Amrish Vaid	Dr. Berjesh Ajrawat and Dr. Anamika Jamwal
Rajouri	Dr. Arvind Kumar Ishar	Dr. Vishal Sharma
Reasi	Dr. Banarasi Lal	Dr. Sanjay Koushal
Bandipura	Dr. M H Samoon	Dr. Tariq Sultan
Pulwama	Dr. Fayaz Ahmad Misgar	Mr. Aejaz Ahmad Sheikh
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