

1. Summary of Cluster Frontline Demonstrations of Rabi Pulses (2015-16)

During the rabi season 2015-16, total of 13527 cluster frontline demonstrations on rabi pulses were conducted covering 15382 ha of area across all the eight zones of country. Only 2.5 % of the total area allotted remained uncovered and 1500 ha of the area was shifted for summer demonstrations (Table 1).

The cropwise details as shown in Table 2 indicate that chickpea occupied highest area under demonstration i. e. 5515.69 ha followed by lentil (3096.09 ha), green gram (2203.22 ha), fieldpea (2018.6 ha) and black gram (670.2 ha). Some small areas were also covered for the crops like Rajma, French bean and red gram as indicated in the same table.

The zone-wise detailed performance of the crops taken under the demonstrations are given overleaf.

Table 1: Zone Wise Summary of Pulses

Zone	Area	Conducted	Summer	Remaining
1	1651	1319	332	0
2	4486	4466	0	20
3	1254	1144	0	110
4	2704	1948	566	190
5	1092	1069.2	0	22.8
6	1130	707	423	0
7	2392	2202.6	179.4	10
8	672	672	0	0
Total	15381	13527.8	1500.4	352.8

Table 2: Crop-wise ATARI- Wise Pulses Report

Zone	Chick Pea	Lentil	FieldPea	Green Gram	Black Gram	Rajma	French Bean	Red Gram	Conducted In Summer	Remaining	Total
1	586.74	172.26	20	540	0	0	0	0	332	0	1651
2	1200	1314	859.6	938.4	154	0	0	0	0	20	4486
3	31	388	459	89	162	5	10	0	0	110	1254
4	509	879	560	0	0	0	0	0	566	190	2704
5	872	0	0	75	112.2	0	0	10	0	22.8	1092
6	656.95	20.23	0	30.82	0	0	0	0	422	0	1130
7	1430	322.6	120	330	0	0	0	0	179.4	10	2392
8	230	0	0	200	242	0	0	0	0	0	672
Total	5515.69	3096.09	2018.6	2203.22	670.2	5	10	10	1499.4	352.8	15381

2. Punjab, Haryana, Himanchal and Jammu & Kashmir ICAR- ATARI, Ludhiana, Zone-I

i. Performance of Chickpea

Among pulse crops, chickpea is an important crop that could be grown to boost the production of pulses in India. There is perceptible need to demonstrate the farmers that chickpea/Bengal gram could be one of the alternative to wheat in *Rabi* season in the pursuit of diversification and sustainability of rice-wheat cropping system

Punjab: In Punjab, chickpea varieties i.e. PBG-7, GPF-2 and GNG-1581 were demonstrated at 9 KVKs. Out of total allotted area 360 ha, 145.04 ha FLDs was conducted by the KVKs while rest of the area 214.96 ha was converted into summer moong. As compared to the local check, 0.8 per cent higher yield was recorded from overall FLDs of chickpea (Table 2). The maximum average yield was recorded at district Nawashahar while lowest was recorded at Mohali. Major technologies demonstrated at the farmers field were Improved Variety, Seed inoculation *Rhizobium* culture, seed treatment with Bavistin, Full package and Weed Control.

Haryana: In Haryana, all the allotted 360 ha area on chickpea varieties i.e. HC-1 were demonstrated in Bhiwani, Hisar, Fatahabad, Gurgaon, Mahendergarh, Jhajjar, Rewari and Karnal districts. The data indicated that the 2.70 per cent higher yield was obtained over the local check (Table 2). The integrated crop management, seed treatment with Chloropyriphos and *Rhizobium* culture in chickpea were the technologies demonstrated at the farmer's field. In Haryana, maximum yield was recorded at Karnal district while lowest was recorded at Hisar district.

Himanchal Pradesh: In Himachal Pradesh chickpea varieties were demonstrated at 5 districts i.e Una, Hamirpur, Bilaspur, Shimla and Mandi districts. Out of total allotted 91 ha area, crop was demonstrated on an area of 61.7 ha due to unavailability of seeds and further 6.8 ha was converted to summer moong of KVK Una. Except Shimla, as compared to local check 62.00 per cent higher yield was recorded from demonstrations of chickpea, as crop is not harvested there.

Jammu & Kashmir: In J&K, chickpea variety GNG-1581 was used for 150 demonstrations on 60 ha area of Kathua, Rajouri and Jammu districts under rainfed conditions. Over the local check, 17.1 per cent higher yield was recorded. Full package of practices were followed to raise the crop under rainfed conditions. In Jammu intercropping of mustard was taken with chickpea for covering the risk of crop failure.

ii. Performance of Lentil

Lentil is second major winter sown legume after chickpea which is grown in winter season. In India, rice-lentil cropping system is dominant, although lentil is sown after maize, pearl millet, sorghum and cotton. More than 90 per cent of lentil is grown on conserved soil moisture in rainfed and dryland areas after monsoon rains. Lentil is also sown as mono cropping, mixed cropping, intercropping or relay cropping in various parts of India.

Punjab, lentil variety LL-699 was demonstrated in 252 FLDs in KVKs of Hoshiarpur, Gurdaspur and Jalandhar. Out of total 120.00 ha area 84 ha in were conducted, however, rest of the area converted into summer moong. Average 68.31 per cent higher yield was recorded from the all FLDs of the Punjab. however, in Jalandhar it was introduced first time. Major technologies used were seed treatment with captan, inoculation with consortium [(*Rhizobium*)+(Rhizobacteria)].

Haryana, lentil varieties like DPL-62 and L-4594 were demonstrated in 213 FLDs on 85.20 ha of area in Yamunanagar, Ambala and Kurukshetra districts, while deficient FLDs were converted into summer moong (Table 2). The technologies demonstrated in the farmer's field were integrated crop management, seed inoculation with *Rhizobium* culture, as a result **34.55** per cent higher yield was recorded.

Himanchal Pradesh, At Bilaspur district of HP, Vipasha variety of lentil was demonstrated (3.00ha). Crop was sown by *Kera* method and full dose of N&P was applied at the time of sowing. Stomp 30 EC@4.5 l/ha was sprayed within 48 hours of sowing to control the weeds. As a result of such practices 51.20 per cent higher yield was recorded over the local check.

iii. Demonstrations of Fieldpea

In Pulwama district of J&K, field pea varieties like Rachna and Shalimar pea-1 were demonstrated in 50 FLDs on 20 ha area and technology demonstrated such as seed with package and practices of SKUAST Srinagar. The results of the crop are awaited.

3. Bihar, Jharkhand and West Bengal ICAR- ATARI, Kolkatta, Zone-II

Out of 4486 ha allotted demonstrations, coverage was made in 4466 ha through 11215 demonstrations. Area under chickpea was 1200 ha, lentil 1314 ha, greengram 938.4 ha, field pea 859.6 ha and blackgram 154 ha. Out of these area coverage of area in Bihar was 2802 ha, Jharkhand 1102 ha and West Bengal 948 ha.

i. Performance of Chickpea

In Bihar, chickpea was demonstrated in 498 ha through 1245 demonstrations. Highest yield was recorded as 16.8 q/ha, lowest was 11.7 q/ha and average yield was 14.2 q/ha. Average increase due to demonstrations of various technologies was 33.4%. The average net return was Rs.47174/ha and BC ratio was 3.1. Several technologies like INM, IPM, micronutrients, line sowing, pheromon trap, seed treatment were introduced in these demonstrations.

In Jharkhand, chickpea was demonstrated in 502 ha through 1305 demonstrations. Average yield in these demonstrations was recorded as 14.6 q/ha compared to local check average of 9.5 q/ha. There by increase was 59.5%. The average net return was Rs.32168 with BC ratio of 3.9.

In West Bengal chickpea is grown in some pockets. However, initiative was taken to cover a large area of 200 ha in order to popularize the crop in West Bengal. The average yield was recorded as 12.3 q/ha in these 500 demonstrations. Increase in yield was 29.6%. The average net return was Rs.27353/ha with BC ratio of 2.2.

ii. Performance of Lentil

Lentil is the most important pulse crop in eastern states. The coverage area in Bihar was 1008 ha involving 2520 demonstrations. Highest yield was recorded as 14.9 q/ha in lentil and average yield was 14.4 q/ha. Increase in yield was 37.5%. The average net return was Rs.28220/ha due to good price of the lentil crop in last few years. The BC ratio was 3.2.

In West Bengal lentil crop was demonstrated in 306 ha and 765 demonstrations were organized. The average yield in these demonstrations was 9.5 q/ha and increase in yield about 33.4%. The average net return was attractive and as high as Rs.36341/ha with BC ratio of 2.9.

iii. Performance of Greengram

Greengram is grown in all the three states specially in rabi and spring-season. The coverage of the crop in the state of Bihar was 448.4 ha and 1121 demonstrations were organized. The crop is yet to harvest.

In the state of Jharkhand, greengram demonstrations were organized in 282 ha and 705 demonstrations were conducted. The average yield was 9.7 q/ha against local check of 8.8 q/ha and increase by 10.2%. Net return was Rs.38681/ha with BC ratio of 2.3.

In West Bengal coverage of area under greengram was 208 ha and 520 demonstrations were organized. The average yield was 8.9 q/ha increase by 26.9%. Net return was Rs.25197/ha with BC ratio of 1.8.

iv. **Performance of Field Pea**

In field pea large area was covered under demonstration in Bihar which was about 693.6 ha. The number of demonstrations was 1734. Average yield recorded was 14.3 q/ha compared to existing yield of 10.4 q/ha. The average increase was 40.2%. Average net return was Rs.18289/ha with BC ratio of 1.9.

In Jharkhand coverage of area was 96 ha and number of demonstrations was 215. The highest yield was 16.6 q/ha compared to local check yield of 8.9 q/ha - an increase by 62.3%. The average net return was Rs.13311/ha with BC ratio of 1.7.

In West Bengal, crop was demonstrated in 80 ha through 200 no. of demonstrations. The highest yield was 9.9 q/ha, average yield was 8.9 q/ha - an increase by 30.3%. Net return was Rs.1212976/ha with BC ratio of 1.7.

4. Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura
ICAR- ATARI, Meghalaya, Zone-III

i. Performance of Lentil

Lentil is an important pulse crop in north eastern states. In Arunachal Pradesh, lentil was demonstrated in 10 ha through 27 demonstrations. Highest yield was recorded as 8.9 q/ha, lowest was 5.8 q/ha and average yield was 7.44 q/ha. The average net return was Rs.21795/ha and BC ratio was 2.44. Several technologies like INM, IPM, micronutrients, line sowing, and seed treatment were introduced in these demonstrations. In Assam, lentil was demonstrated in 256 ha through 663 demonstrations. Average yield in these demonstrations was recorded as 7.65 q/ha compared to local check average of 5.38 q/ha. There by increase was 50.88%. The average net return was Rs. 28703 with BC ratio of 2.46. In Manipur, lentil covered an area of 40 ha. The average yield was recorded as 6.0 q/ha in 64 demonstrations. The average net return was Rs.26546/ha with BC ratio of 2.0. In Meghalaya, lentil is a new crop. It was demonstrated in an area of 16 ha through 177 demonstrations. The average yield was recorded as 7.0 q/ha. The average net return was 23200/ha with BC ratio of 1.90. In Mizoram, lentil was demonstrated in 20 ha through 50 demonstrations. Highest yield was recorded as 8.75 q/ha, lowest was 4.75 q/ha and average yield was 7.0 q/ha. The average net return was Rs.76250/ha and BC ratio was 3.80. In Nagaland, the demonstrations were conducted on lentil in 6 ha through 6 demonstrations. Highest yield was recorded as 6.57 q/ha in lentil and average yield was 5.57 q/ha. The average net return was Rs.44920/ha with BC ratio of 2.31. The coverage area in Tripura was 40 ha through 142 demonstrations. The average yield was 6.80 q/ha against local check of 3.55 q/ha and increase by 91.54%. The average net return was Rs.19452/ha and BC ratio was 1.82.

ii. Performance of Field Pea

In **Arunachal Pradesh**, field pea was demonstrated in 40 ha through 105 demonstrations. Highest yield was recorded as 16.44 q/ha, lowest was 8.25 q/ha and average yield was 11.25 q/ha. Average increase due to demonstrations of various technologies was 54.11%. The average net return was Rs.33778/ha and BC ratio was 2.14. In **Assam**, field pea was demonstrated in 282 ha through 765 demonstrations. Average yield in these demonstrations was recorded as 10.0 q/ha compared to local check average of 6.61 q/ha. There by increase was 80.19%. The average net return was Rs.23739/ha with BC ratio of 2.20. In **Manipur**, field pea covered an area of 30 ha. The average yield was recorded as 12.92 q/ha in 54 demonstrations. Increase in yield was 8.29%. The average net return was Rs.27474/ha with BC ratio of 2.03. In **Meghalaya**, field pea was demonstrated in an area of 23 ha through 206 demonstrations. The average yield was recorded as 15.45 q/ha with increase of 56.85%. The average net return was 35410/ha with BC ratio of 2.06. In **Mizoram**, field pea was demonstrated in 30 ha through 75 demonstrations. Highest yield was

recorded as 15.47 q/ha, lowest was 10.59 q/ha and average yield was 13.32 q/ha. Average increase due to demonstrations of various technologies was 166.4%. The average net return was Rs.44940/ha and BC ratio was 4.40. **In Nagaland**, the demonstrations were conducted on field pea in 30 ha through 60 demonstrations. Highest yield was recorded as 17.62 q/ha in field pea and average yield was 12.29 q/ha. Increase in yield was 62.85%.The average net return was Rs.42300/ha with BC ratio of 3.72. **In Sikkim**, area under field pea was 4 ha through 18 demonstrations. Average yield was 17.3 q/ha with increase of 54.46%. The average net return was 28660/ha with BC ratio of 1.89. The coverage area in **Tripura** under field pea was 20 ha through 74 demonstrations. The average yield was 13.0 q/ha against local check of 9.5 q/ha and increase by 36.84%.The average net return was Rs.13591/ha and BC ratio was 1.41.

iii. Performance of Chickpea

In **Arunachal Pradesh**, area under chickpea was 10 ha through 25 demonstrations. Average yield in these demonstrations was recorded as 11.0 q/ha with percent increase of 22.22%. The average net return was Rs. 55500 with BC ratio of 3.46. In **Manipur**, area under chickpea was 10 ha through 20 demonstrations. Average yield was 10.50 q/ha. The average net return was Rs. 41784/ha with BC ratio of 2.97. In Meghalaya, area under chickpea was 1ha through 112 demonstrations. In **Mizoram**, area under chickpea 10 ha through 25 demonstrations. Average yield was 17 q/ha with average net return of Rs. 67855/ha and BC ratio of 4.06.

iv. Performance of Rajma

In **Nagaland**, area under rajma was 2 ha with an average yield of 13.5 q/ha with increase of 14.50%. The average net return was Rs. 81820/ha with BC ratio of 7.54. In **Sikkim**, area under this crop was 3 ha with an average yield of 10.26 q/ha. This is a new crop introduced for the first time in the KVK. The average net return was Rs. 91120/ha with BC ratio of 3.80.

v. Performance of Frenchbean

In **Arunachal Pradesh**, area under French bean was 10 ha through 31 demonstrations. Average yield was 17.65 q/ha with increase of 78.82%. The average net return was Rs. 72475/ha with BC ratio of 3.94.

vi. Performance of Black gram

In **Assam**, area under black gram was 120 ha through 258 demonstrations. In **Manipur**, area under black gram was 10 ha through 25 demonstrations, while, in **Meghalaya** black gram covered 22 ha through 173 demonstrations. In Tripura, area under black gram was 10 ha through 29 demonstrations.

vii. Performance of Green gram

In **Assam**, area under green gram was 67 ha through 174 demonstrations. In **Manipur**, area under green gram was 10 ha through 25 demonstrations, while, in **Meghalaya** area under green gram was 12 ha through 146 demonstrations.

5. Uttar Pradesh and Uttarakhand

ICAR- ATARI, Kanpur, Zone-IV

i. Performance of Chickpea:

Cluster FLDs on Chickpea were conducted in an area of 1271 acre (509 ha) with 1344 farmers by 22 KVKs in Uttar Pradesh. Results indicate that the average demo yield of 14.75 q/ha with yield increase of 49.89 per cent in Uttar Pradesh was more as compared to Existing farmers Yield (9.84q/ha) followed by 43.62 percent yield increases over district level (10.27q/ha). Among Chickpea varieties demonstrated, Jaki-9218 was demonstrated in more area (570 acre) with 640 farmers by 11 KVKs viz., Allahabad, Auriya, Lalitpur, Varanasi, Banda, Jhansi, Kaushambi, Mirzapur, Jalaun, Etawah, and Unnao followed by RSG-945, 963, 895, 973, Awrothi, Uday, JG 16, KGD 1168, KPG-59, PG-186, and DCP 92-3 in 701 acre with 704 farmers by fourteen KVKs.

ii. Performance of Lentil:

Cluster demonstrations on lentil were conducted in an area of 2228 acre (879) ha with 2516 farmers by 49 KVKs. In Uttar Pradesh 46 KVKs conducted 2148 demonstration (859) with 2333 farmers and 3 KVKs in Uttarakhand conducted 75 demonstration with active participation of 183 farmer. In Uttar Pradesh results shows that the average demo yield of 12.50q/ha with yield increase of 38.89 per cent over local check (8.99 q/ha). Among lentil varieties demonstrated in Uttar Pradesh are IPL-81, NDL-1PL-08, IPL-406, L-4594, DPL-62, HUL-57,K-75, Shekhar-3, KLB-320 etc. In Uttarkhand results shows that the average demo yield of 8.53q/ha with yield increase of 37.13 per cent over local check (6.22 q/ha). Among lentil varieties demonstrated are PL-08.

iii. Performance of Field Pea:

Cluster demonstrations on Field pea were conducted in an area of 1400 acre (560) ha with active participation 1827 farmers by 27 KVKs of Uttar Pradesh. Results shows that the average demo yield of 16.52q/ha with yield increase of 46.32 per cent over local check (11.29 q/ha). Among field Pea varieties demonstrated in Uttar Pradesh are Vikas, Prakash, Aman, KPMR-400, KPMR-522, HUDP-15, JPF-9925, Jai, Indra, Sapna, Sikha etc.

6. Andhra Pradesh, Telangana and Maharashtra

ICAR- ATARI, Hyderabad, Zone-V

i. Performance of chickpea:-

The Cluster Frontline Demonstrations on Bengal gram crop was carried out by KVK's in all the three states i.e. Andhra Pradesh, Telangana and Maharashtra. A total of 2096 demonstrations were organized covering an area of 872 hectares in medium to heavy black soil, sandy soils both under rain fed and irrigated conditions. The sowings were spread over October II week to December 1st week under kharif fallow and other crops viz. Maize, soybean, cotton etc. Improved seed of varieties Digvijay, JAKI-9218, Vijay, BDNG-797 (Akash), NBeG-3, Nandyala senaga-1 etc., and critical inputs bio-fertilizers viz., rhizobium, PSB, bio-pesticides trichoderma viridae, Ha NPV pheromone traps, neem oil, weedicides, KNO₃, sulphur, micronutrients Zn, Fe and boron IPM, INM and plant protection measures against pod borer were introduced in the demonstrations. In-organic fertilizers were applied by the farmers on their own. During the visit to cluster FLD's, it was observed that due to low rainfall during rainy (kharif) season and non-receipt of rainfall during crop period and sudden increase in temperatures from IIIrd week of September affected the crop growth, incidence of insect pests/disease and reduced the yields. Seed treatment with rhizobium and PSB initially, crop growth was better compared to control plot.

ii. Blackgram:-

Blackgram cluster Frontline demonstrations were organized in rabi 2015-16 and sown during November, December 2015 and January 2016 months in Andhra Pradesh and Telangana states in medium black and sandy loams under rain fed (residual moisture) and irrigated conditions. A total of 262 demonstrations were conducted in 11 locations (KVKs) in 9 districts covering an area of 112.2 hectares. The improved varieties LBG-752 and PU-31 along with bio-fertilizers, rhizobium, PSB, bio-pesticides, weedicides, neem and pongamia cakes, micronutrients spray and plant protection measures against yellow mosaic virus and leaf spot were demonstrated.

iii. Greengram:-

Cluster Frontline demonstrations on green gram were conducted in rabi 2015-16 and sown during November, December 2015 and January & February 2016 months in Andhra Pradesh and Telangana states in red and sandy soils under rainfed & irrigated conditions. The improved varieties viz LGG-460, TM 96-2, MGG-295, WGG-42 along with critical inputs bio-fertilizers viz., rhizobium, PSB, azospirillum, bio-pesticides trichoderma viridae, HaNPV, pheromone traps, neem oil, weedicides, KNO₃, sulphur, micronutrients Zn, Fe and boron IPM, INM and plant protection measures against yellow mosaic virus and leaf spot were demonstrated. A total of 200 demonstrations were conducted covering an area of 75 hectares by seven KVKs in six districts.

iv. Pigeon pea:-

To promote rabi pigeon pea cultivation in Telangana, cluster frontline demonstration were organized in red soils under irrigated situation in Nalgonda district. A total of 28 demonstrations were taken up in 10 hectares area. Improved and high yielding seed of LRG-41 variety along with rhizobium, plant protection measures were demonstrated in the villages. Improved and high yielding and helicoverpa tolerant variety LRG-41 was demonstrated along with recommended package i.e. 20:50:0 NPK and plant protection measures. Chloropyriphos, neem oil for control of helicoverpa etc. The crop was sown in October II week in red soils. The results showed that an average yield of 12.75 q/ha was obtained in the demonstration with an highest yield of 17.5 q/ha. The improved technology gave an additional net returns of Rs.10,125/ha. Due to low rainfall in kharif season and less requirement of irrigation, the farmers satisfied with the performance of the rabi red gram demonstrations and expressed their interest to cultivate the crop in next rabi season.

v. Green gram :

In Telangana, on greengram, the demonstrations were conducted in Khammam district in November month in red sandy loams and medium black soils after paddy and sugarcane crops. Variety MGG-295 along with recommended dose of fertilizer, weedicide and need based plant protection measures were demonstrated. In Chittoor (Tirupathi), Srikakulam and Vizianagaram also the green gram demonstrations were organized during November and December months in

rice fallows with variety LGG-460, application of micronutrients, weed management and plant protection against YMV and leaf spot. In case of Karimnagar and Chittoor (Kalikiri) area the demonstrations were sown during February II nd fortnight with variety WGG-42 and TM 96-2, seed treatment with azospirillum, PSB and chemical weed management. In Khammam the early withdrawal of rainfall, in September III rd week and sudden increase in temperatures during crop growth period, insect pest and disease incidence was more. In demonstrations, at different locations, the average seed yield recorded ranged from 8.14 to 12.0 q/ha with an average of 9.04 q/ha against 6.55q/ha in the check plots. The highest yield recorded in the demonstration is 15.0q/ha in Karimnagar district followed by 13.25q/ha in Srikakulam obtained in the demonstration in Khammam district against the existing yield of 5.4 q/ha. In Vishakapatnam, district the demonstrations were failed due to moisture stress.

Over the locations, the improved package of practices gave an additional net returns of Rs.9,113/ha over existing practice.

vi. Blackgram :

Cluster demonstrations on blackgram during rabi 2015-16 were conducted at 11 locations by KVKs in Telangana and Andhra Pradesh states with improved varieties and package of practices. Latest high yielding & YMV tolerant varieties viz., LBG-752 and PU-31 and other package of practices viz., rhizobium, PSB, Tricoderma viridae, weed control through pre & post emergence weedicides, foliar application of micro nutrients Zn, K₂O and application of need based plant protection measures against YMV, sucking pests etc. were demonstrated. The demonstrations were sown under residual moisture conditions in rice fallows and other kharif crops. The soil type varied from medium black, sandy loams & red soils. A perusal of yield data recorded showed that revealed that, the average yields of the demonstration ranged from 8.8 to 12.3 q/ha under rain fed residual moisture situation. Under irrigated condition, the average yield of 17.12q/ha was obtained in Guntur district with variety PU-31 which is tolerant to yellow mosaic virus. In Krishna (Ghantasala) area, an average yield of 12.3 q/ha was recorded with a highest yield of 15.0 q/ha. At other locations the average yields are low, due to demonstrations conducted under rainfed situation and rains were not received during crop season.

The demonstration on black gram organized under rainfed situation in Andhra Pradesh state gave an average additional net returns of Rs.12,993/ha. In case of irrigated blackgram the additional net returns obtained was Rs.33,739/ha.

7. Rajasthan and Gujarat

ICAR- ATARI, Jodhpur, Zone-VI

i. Performance of Chickpea:

A total of 1798 demonstrations of chickpea were organised in 656.95 ha area in zone-VI. Out of total demonstrations, 1243 demonstrations conducted in 444.33 ha area of Rajasthan state while 212.62 ha area covered under 555 demonstrations in Gujarat. The highest average yield was observed in sub-humid southern plain and aravali hill zone (IVa) i.e., 17.46q/ha which involved Rajsamand, Chittorgarh and Udaipur districts. GJG3 variety of chickpea demonstrated highest yield i.e., 25.29q/ha in Sabarkantha (North Gujarat). In Rajasthan, maximum yield of 18.85q/ha was recorded by KVK, Rajsamand under demo of GNG 1581 variety.

ii. Performance of Lentil

Lentil demonstrations were laid out in 20.23 ha area in 50 farmers' fields in Bharatpur district of Rajasthan. The average yield under demonstration was 6.92q/ha with the net return of Rs.27000/ha compared to local variety (5q/ha). Under demo, a yield advantage of 38.48% was observed.

iii. Performance of Green gram (Rabi)

Total 100 demonstrations were conducted in 30.84 ha area in rabi season in Navsari and Tapi districts of Gujarat. The average yield of demonstrations in Tapi district was 10.5q/ha with 50% yield increase compared to local variety. The demo yield was recorded 8.35q/ha in Navsari district.

8. Madhya Pradesh, Chattishgarh and Orrisa

ICAR- ATARI, Jabalpur

Out of 2392 ha allotted demonstrations, coverage was made in 2202.6ha through 5189 demonstrations. Area under chickpea was 1430ha, lentil 322.6ha, greengram 330ha and field pea 120ha. Out of these area coverage in Madhya Pradesh was 972.6ha, Chhattisgarh 720ha and Odisha 510ha.

i. Performance of Chickpea

In Madhya Pradesh, chickpea was demonstrated in 760ha through 1878 demonstrations. Highest yield was recorded as 19.76q/ha, lowest was 10.11q/ha and average yield was 14.85q/ha. Average increase due to demonstrations of various technologies was 38.66%. The average net return was Rs.31624/ha and BC ratio was 2.73. Several technologies like INM, IPM, micronutrients, line sowing, pheromon trap, and seed treatment were introduced in these demonstrations.

In Chhattisgarh, chickpea was demonstrated is 490 ha through 1034 demonstrations. Average yield in these demonstrations was recorded as 11.15q/ha compared to local check average of 7.28q/ha. There by increase was 72.9%. The average net return was Rs.25895.20 with BC ratio of 2.63.

In Odisha chickpea was demonstrated in 180ha through 460 demonstrations. The average yield was recorded as 12.7q/ha in these 460 demonstrations. Increase in yield was 24.4%. The average net return was Rs.29263.30/ha with BC ratio of 2.41.

ii. Performance of Lentil

Lentil is the important pulse crop in central states. The coverage area in Madhya Pradesh was 172.6ha involving 433 demonstrations. Highest yield was recorded as 21.45q/ha in lentil and average yield was 12.58 q/ha. Increase in yield was 88.27%. The average net return was Rs.42273.30/ha. The BC ratio was 3.26.

In Chhattisgarh lentil crop was demonstrated in 150ha and 295 demonstrations were organized. The average yield in these demonstrations was 8.02q/ha and increase in yield about 59.5%. The average net return was Rs.17815/ha with BC ratio of 2.14.

iii. Performance of Green gram

Greengram is grown specially Odisha state. The coverage of the crop in the state of Odisha was 330ha and 839 demonstrations were conducted. The average yield of green gram crop is 7.08q/ha. The highest yield was recorded 7.92q/ha in kvk, Sundergarh II. Increase in yield was 61.96% and the average net return was Rs. 14156.28/ha with BC ratio was 2.03.

iv. Performance of Field Pea

In Madhya Pradesh, Field Pea was demonstrated in 40 ha through 97 demonstrations. Average yield recorded was 14.8 q/ha compared to existing yield of 9.28q/ha. The average increase was 56.27%. Average net return was Rs.34430.50/ha with BC ratio of 3.08. In Chhattisgarh coverage of area was 80 ha and number of demonstrations was 153. The highest yield was 9.95q/ha compared to local check yield of 6.79q/ha - an increase by 46.54%. The average net return was Rs.17444.75/ha with BC ratio of 2.32.

Karnataka And Tamil Nadu

ICAR- ATARI, Bangaluru, Zone VIII

A total of 1680 cluster FLDs were conducted in an area of 672 ha that comprises 545 demos in 218 ha in Karnataka and 30 demos in 12 ha in Tamil Nadu for chickpea, 75 demos in 30 ha in Karnataka and 530 demos in 212 ha in Tamil Nadu for blackgram, and 175 demos in 70 ha in Karnataka and 325 demos in 130 ha in Tamil Nadu for greengram.

i. Chickpea: Data indicate that the average yield obtained with demonstrated varieties along with production technologies of chickpea was 10.35 q/ha as against check (8.06 q/ha) in Karnataka and 11.80 q/ha as against check (8.25 q/ha) in Tamil Nadu with yield increase of 21.12 and 30.03 per cent in Karnataka and Tamil Nadu, respectively. However, the BCR (2.85) was more in chickpea demos in Karnataka as compared to demos in Tamil Nadu (2.05).

ii. Blackgram: Data shows that the average yield obtained with demonstrated varieties along with production technologies of blackgram was 5.27 q/ha as against check (4.22 q/ha) in Karnataka and 8.67 q/ha as against check (6.77 q/ha) in Tamil Nadu with yield increase of 19.93 and 21.26 per cent in Karnataka and Tamil Nadu, respectively. Correspondingly, the BCR (3.11) was more in blackgram demos in Tamil Nadu as compared to demos in Karnataka (3.09).

iii. Greengram: Data shows that the average yield obtained with demonstrated varieties along with production technologies of greengram was 4.69 q/ha as against check (3.76 q/ha) in Karnataka and 8.70 q/ha as against check (6.70 q/ha) in Tamil Nadu with yield increase of 19.06 and 23.32 per cent in Karnataka and Tamil Nadu, respectively. Correspondingly, the BCR (2.84) was more in greengram demos in Tamil Nadu as compared to demos in Karnataka (2.41).