

Success Story on Large Scale Adoption of Improved Rabi Mungbean Variety Under CFLD programme in Northern Karnataka

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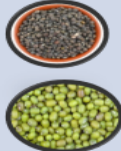
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Pulses are the integral part of many diets across the globe and they have great potential to improve the human health, conserve soil fertility, protect the environment and contribute to global food security. India is the largest producer, consumer and importer of the pulses in the world. Despite India being the largest producer (18.5 million tons) and processor of pulses in the world, also imports around 3.5 million tons annually on an average to meet its ever-increasing consumption needs of around 22.0 million tons. Every year we are importing pulses worth 4000 to 4500 crore rupees to meet the increasing demand of pulses. Green gram is one of the important kharif season pulse grown in Karnataka state in general and Dharwad district in particular. The Dharwad district comprises of five taluks viz., Dharwad, Hubballi, Kundagol, Navalgund, Annigeri, Alnavar and Kalaghatagi. The cultivation of green gram in rabi/ summer season is the special feature of Kalaghatagi taluk, in which paddy is the major kharif crop covering an area of 28365 ha and green gram is grown mainly in paddy fallows during rabi season immediately after the harvest of the paddy crop. These soils are usually highly fertile. Instead of leaving the fields fallow during the rabi season, farmers utilize the residual moisture in the soil to grow green gram. Among the rabi crops green gram, reigning poor man’s crop over the centuries and has potential to sustain food and nutritional security of the small and marginal farmers because of its short duration, faster growth and high nutritive values. But the yield levels are much lower than the normal season. The participatory rural appraisal study in the taluk reveals that the non-availability of released variety suited to rabi season, farmers were cultivating the local variety of green gram i.e Kari hesaru (in which seeds are black in colour) which is low yielding, susceptible to mungbean Yellow Mosaic Virus (YMV), leaf crinkling and powdery mildew diseases and grown purely on rainfed situation. For control of these pests and diseases farmers were using pesticides indiscriminately which has led to increased cost of cultivation. The local variety has lesser plant height,

canopy spread and lower biomass production leads to lower yield. The local variety being long duration of 85-90 days made impossible to cultivate the third crop during summer season. These factors cause the poor yield thus reducing income of farmers Keeping in view, to identify the suitable variety for rabi season, AICRP on MULLaRP, University of Agricultural Sciences, Dharwad conducted series of experiments and found new variety IPM-02-14 (Shreya) having high yield potential (8-10 q/ha) with resistant to mungbean Yellow Mosaic Virus (YMV), leaf crinkling and powdery mildew diseases. By looking into its performance, University of Agricultural Sciences, Dharwad adopted this variety for commercial cultivation during 2015 for zone 8 of Northern Karnataka. This variety was earlier released by IIPR, Kanpur in the year 2009-10 for southern India (Karnataka, Andhra Pradesh, Tamil Nadu and Orissa). Hence to popularize this variety there is a need for varietal and seed replacement and application of best practices in farmer’s field for getting higher production.

INTERVENTION TECHNOLOGY

Demonstration (T-1)	Farmers practice (T-2)
<ul style="list-style-type: none"> Mungbean Variety: IPM-02-14 (Shreya) RDF (5:10:0 N:P:K kg/ac) Rhizobium @ 200 g/ac PSB @ 500 g/ac Trichoderma @ 4 g/kg of seeds Yellow sticky traps (8/ac) Pulse Magic @ 5 g/l Hexaconazole @ 1 ml/l 	<p>Local variety (Kari hesaru)</p> 

No. of Demos/ farmers .	Area (ha)	Villages	Farming situation	Dos
50	20.	Halligeri & Surashetikoppa	Rainfed	15.12.20 to 25.12.20

Loamy soil

Intervention Process

The ICAR-Krishi Vigyan Kendra, Dharwad, conducted cluster front line demonstration (CFLD) under National Food Security Mission in paddy fallow areas of Kalaghatagi taluk to popularize improved green gram variety IPM 02-14 (Shreya) developed at University of Agricultural Sciences, Dharwad during rabi season of 2020-21.



Intervention Technology

To popularize improved green gram variety IPM 02-14 (Shreya) developed at University of Agricultural Sciences, Dharwad during Rabi/summer season of 2020-21. The CFLD were conducted in the area of 20 hectares on 50 selected farmer's fields. The Kalaghatagi taluk of Dharwad district was selected for the demonstrations because of availability of larger drill sown paddy area in rainfed situation. The Kalaghatagi taluk comes under hilly tract (zone - 9) and it is characterized under high rainfall area with average up to 1023 mm. The maximum temperature recorded during summer is 35°C (April - May) and the minimum temperature during winter is 9.5°C (January). The demonstrations aimed to attain the food and nutritional security through three-fold technological interventions such as introduction of high yielding variety, transfer of improved production package (seed treatment with bio agents viz., rhizobium, trichoderma, PSB, 2 % DAP spray at flowering and pod initiation stage) and use of integrated pest management practices. These demonstrations were carried out in adopted villages Surshettikoppa and Halligeri. The first step after selection was the collection of soil samples from each demo plot and they were analyzed for the nutrient status. Based on the soil test report, fertilizers were applied. The critical inputs like seeds, bio agents for seed treatment and need based pesticides were provided to the farmers. The improved variety, IPM 02-14 (Shreya) along with local check variety (Kari hesaru), was demonstrated in an area of 0.4 ha for comparison on 50 farmers fields. The seeds of each variety were sown with seed-cum fertilizer drill to maintain uniform plant spacing. The KVK conducted on and off campus training programmes on improved green gram production technology such as seed treatment with bioagents like rhizobium, trichoderma

PSB and 2 % DAP spray at flowering and pod initiation stage. Farm science centre scientists facilitated in performing the field operations like seed treatment, sowing, manuring, weeding, spraying, harvesting and post-harvest handling activities. During the crop production pre-season meetings, regular field visits, training programmes, group discussions, farmer-scientist interaction and field days were conducted to enlighten the farmers about the benefits of the demonstrated technology. The yield was recorded and economics was worked out based on the current market price of inputs and produce.

Impact-Horizontal Spread

The improved variety IPM-02-14 (Shreya) being a short duration (75 days) variety, helped the farmers to plan third crop even in summer season and which in turn helped in improving the economy of the farming community. Also being resistant to Mungbean Yellow Mosaic Virus and crinkling disease led to less cost of cultivation compared to local variety. The positive attribute of IPM 02-14 (Shreya) variety helped in the dissemination of technology in and around the villages in paddy fallow areas of Kalaghatagi Taluk. Out of 50 farmers involved in cluster FLD programme during 2020-21, 35 of them have sown this variety during 2021-22 rabi/ summer season in an area of 75 hectares. Further, Karnataka State Department of Agriculture, Kalghatagi taluk undertaken the up-scaling of this technology in 20 hectares of area has been covered. Similarly, under NFSM, KVK, Dharwad also undertaken on 20 hectares area with 50 farmers during Rabi season of 2021-22.



Impact-Economic Gains

The IPM 02-14 (Shreya) variety, being resistant to mungbean yellow mosaic virus, powdery mildew and leaf crinkling incidence led to lower cost of cultivation (Rs 21500/ha) resulting to higher net returns (Rs. 37351/ha) as compared to local variety. In demonstration plot the varieties Shreya recorded the

highest yield of 785 kg ha⁻¹ as compared to the local variety (650 kg ha⁻¹) with increase in yield to the tune of 20.76 per cent. Similar trend was observed for growth and yield parameters. The highest net returns and BC ratio of Rs. 37375 ha⁻¹ and 2.74, respectively were realized with Shreya variety as compared with local variety Kari Hesaru (Rs. 27500 ha⁻¹ and 2.29, respectively). On the contrary the local variety of green gram i.e Kari Hesaru which was susceptible to mungbean Yellow Mosaic Virus (YMV), leaf crinkling and powdery mildew diseases and for control of these pests and diseases farmers used more pesticides which has led to increased cost of cultivation. It was also observed that the local Kari Hesaru was highly susceptible to storage pests, specially bruchid infestation (28 %) compared to IPM-2-14 (20%). This was possible because of the intensive capacity building programmes and various extension activities by KVK scientists. The adoption of new variety through intervention of Krishi Vigyan Kendra, Saidapur Farm, Dharwad in cluster approach enhanced the productivity leading to sustainable income annually. This has not only resulted in socio-economic security but also helped in attaining food and nutrition security of the community along with the fodder requirement of farm animals. Being a short duration variety, farmers could go for third crop in summer season which added additional income for the farming community besides enhancing soil fertility. Introducing improved variety of green gram in rice fallows is a low-cost technology and can raise both yields per hectare and income of the farmer. Rice-pulse rotations conserve both land and water while producing more food, providing more employment

opportunities to agricultural labourers. The awareness about improved technological practices, such as use of improved variety with resistant to pest and diseases, timely sowing, regular mechanical weeding, timely harvesting, post-harvest handling could go a long way in bridging yield gap and also enhancing income of farmers. By popularizing these technologies additional area can be brought under cultivation of pulses under paddy fallow. Looking into success of this technology for seed replacement, seed production activities were undertaken in farmer's participatory mode with BSP/NSP unit of University of Agricultural Sciences, Dharwad. Further, to strengthen the rabi green gram production in the district, KVK, Dharwad also undertook seed production activities under 'Pulse Seed Hub' programme of Ministry of Agriculture and Farmers Welfare, Government of India and to strengthen seed production activities under this programme establishment of new threshing yard cum drying shed and drilling of borewells is being undertaken.

Impact on Employment Generation

Besides the fodder economic gain by marketing of the produce, farmers have taken seed production activities by employing 20-22 men/women labourers with additional income of Rs 1875 /ha. In these cluster villages by adopting the improved technologies socio-economic changes were noticed in many ways like improvement in standard of living, children's education, health, status in the society, house renovation and land development activities were observed.
