Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2020; 8(4): 1469-1472

Received: 20-05-2020
Accepted: 22-06-2020

Venkataravana P
Dean (Seri) and Professor of Genetics & Plant Breeding College of Sericulture, Chintamani, UAS, Bengaluru, Karnataka, India

Mahesh M
Assistant Professor of Plant Pathology, College of Sericulture, Chintamani, UAS, Bengaluru, Karnataka, India

Priyadarshini SK
Assistant Professor of Genetics and Plant Breeding, College of Sericulture, Chintamani, UAS, Bengaluru, Karnataka, India

Corresponding Author:
Venkataravana P
Dean (Seri) and Professor of Genetics & Plant Breeding College of Sericulture, Chintamani, UAS, Bengaluru, Karnataka, India

Impact assessment of frontline demonstrations on improved variety of groundnut: Chintamani-2 (KCG-2) in southern Karnataka

Venkataravana P, Mahesh M and Priyadarshini SK

Abstract
The Front Line Demonstrations (FLD) of groundnut were conducted during *Rabi* (2012-13 to 2014-15) and *Kharif* (2014-15) seasons to demonstrate production potential and economic benefit of improved technologies consisting suitable variety KCG 2 in Ramanagara, Kolar, Chikkaballapur and Tumkur districts of Southern Karnataka over the three years. Recommended dose of fertilizer, rhizobium, zinc and boron were applied along with use of improved variety. TMV2 variety which is age old variety was used in farmers practice as against new variety KCG 2 in improved technologies. The results of the demonstration indicated that the demonstration of improved technology with new variety Chintamani-2 (KCG-2) recorded higher mean pod yield of 2278.56 kg/ha with 20.43 per cent increase in pod yield over farmers practice which recorded mean pod yield of 1896.87kg/ha. The improved technologies recorded haulm yield of 5.29 t/ha with increase of 14.96 per cent compared to farmers practice (4.60t/ha). Higher mean net income of Rs. 58005.93/ha with an incremental Benefit: Cost ratio of 3.43was obtained with improved technologies in comparison to farmer's practices (Rs. 46217.14/ha). The frontline demonstrations conducted on field bean at the farmers' field revealed that the adoption of improved technologies significantly increased the yield as well as yield attributing traits of crop and also the net returns higher than the farmers' practices. Hence, there is a need to disseminate the improved technologies among the farmers with effective extension methods like training and demonstrations. Farmers' should be encouraged to adopt the recommended package of practices for realizing higher returns.

Keywords: Front Line Demonstration, Groundnut, Yield, Net return and B:C ratio

Introduction
Indian Council of Agricultural Research (ICAR) had established Krishi Vigyan Kendras (KVKs) - 'Agriculture Science Centers' all over the India, is an institutional innovation for application of agricultural technologies at the farmer's field with the help of a multi-disciplinary team. The first KVK of the country was established in 1974 at erstwhile Pondicherry and initial mandate of KVKs was confined only to impart training. Krishi Vigyan Kendras (1974) actually originated as one of the four first line extension systems of ICAR that included National Demonstration (1964), Operational Research Projects (1974-75), and Lab to Land Programme (1979). As long as the need for close interaction between farmers, extensionists and researchers in the participatory diagnosis of problems and location specific recommendations, emphasizing joint action and education rather than prescription has been increasingly felt, the Krishi Vigyan Kendra (KVK) network started spread enormously in the country. The immense policy reforms in the KVK mandates and its activities were brought about only after a thorough realization of the importance of micro-eco situation perspectives of technology suitability and its adoption. All the first line extension services were merged with the KVKs during the 1990s with new structural and organizational arrangements. With a decision of establishing KVKs in all the rural districts of the country in Xth five-year plan, the KVKs revised mandate. At present, there is a network of nearly 700 KVKs in the country. Therefore, the main mandate of the KVKs are to plan and carry out on-farm trials (OFTs) to verify, test, validate and refine location-specific technologies developed by the National Agricultural Research System (NARS). The purpose is to have an appropriate technology, which may be economically profitable, ecologically sustainable, technically feasible and culturally compatible. Another important activity of KVKs is to conduct frontline demonstrations (FLDs) on flagship technologies developed by NARS on farmer's field.

Therefore, KVKs system emphasizes the frontline demonstration as a long-term educational activity in a systematic manner on farmers' field under the close supervision of agricultural scientists to show the worth of new practice/technology (Sandeep Suresh Patil, *et al.,* 2018) [4].

Groundnut (*Arachis hypogea* L.), is a leguminous crop plant which is widely cultivated in the tropics and subtropics between 40°N and 40°S latitudes. It is an important oilseed crop in India which occupies first position in terms of area and second position in terms of production. China is the largest producer as well as consumer of groundnut in the world with 171.50 lakh tonnes in 2017-18 followed by India (91.79 lakh tonnes), United States (32.81lakh tonnes), Nigeria (24.20 lakh tonnes) and Sudan (16.41 lakh tonnes). In India, during *kharif* 2019 lower sowing area was reported in few states compared to the previous year due to less rainfall at initial stage of crop, which may support the groundnut prices. It was sown in around 39.31 lakh hectares with the production of 68,62,565 MT and an average yield of about 1745 kg/ha as on 26th September 2019. Among the states, Gujarat stood first in area coverage with 15.52 lakh ha followed by Rajasthan (5.73 lakh ha), Andhra Pradesh (5.37 lakh ha), Karnataka (3.88 lakh ha) and Madhya Pradesh (2.21 lakh ha).In Karnataka ground nut was sown in an area of 3.70 lakh hectares with the production of 469875 MT and an average yield of 1268 kg/ha (Anonymous, 2019) [1]. India has been self-sufficient in food grains, but production of oil seed crops remain static during last 30 to 40 years. There is an urgent need to increase the production of oil seeds. To accelerate the production of oil seeds, ICAR has started front line demonstration (FLD) programme. Latest recommended package of practices of groundnut crop was demonstrated on the farmers' fields. Keeping this in view, research study was under taken to evaluate the FLD on groundnut with the following objectives:

1. To evaluate the FLD in terms of adoption of recommended groundnut production technology.
2. To study the productivity and economics of groundnut on farmers field before and after FLD.

Materials and method

Frontline demonstration(FLD) was conducted by Agricultural Research Station, Chintamani to reveal the potential of groundnut with suitable variety Chintamani-2 (KCG-2) in 40 farmers fields of Ramanagara, Kolar, Chikkaballapur and Tumkur districts of Southern Karnataka for three years during rabi summer seasons (2012-13 & 2013-14) and *kharif* (2014-15). The crop was grown with improved management practices and compared with the farmer's practice. The improved technology included introduction of new variety *i.e.,* Chintamani-2 (KCG-2), recommended dose of fertilizer (25:50:25 kg NPK/ha), *Rhizobium* & Phosphorous solubilising bacteria (PSB) were used as biofertilizers and *Trichoderma*/ Captan @ 3.0 g/ kg seed was used for seed treatment. Further zinc sulphate @ 10 kg/ha, borax @ 4.0 kg/haand Gypsum of 500 kg/ha etc., were used. Front line demonstration was taken in one acre i.e., 0.40 ha by 40 farmers. TMV2 variety which is age old variety was used in farmers practice as against new variety Chintamani -2 (KCG 2) in improved practices. The potential yield data of a new variety was recorded and analysed economics of the technology demonstrated.

Results and discussion

The results of front line demonstrations conducted at Kolar and Chikkaballapur districts during *Rabi/Summer* season of 2012-13 indicated that the improved crop management practices recorded higher mean pod yield of 2470.21 kg/ha and haulm yield of about 5.17t/hawith19.73 and 15.03per cent increased in pod and haulm yield respectively Farmers practice recorded comparatively lower pod yield (2062.50 kg/ha) and haulm yield of about 4.50t/ha (Table 1). Though the cost of cultivation was marginally higher in improved practices, highest gross returns of Rs.104375.00/ha and mean net returns of Rs.80333.33/ha with Benefit: Cost ratio of 4.45was obtained with improved technologies in comparison to farmer's practices (Table 2).

Similarly front line demonstrations conducted at Tumkur and Chikkaballapur districts during *Rabi/Summer* seasons of 2013-14, improved technology recorded higher mean pod yield of 2621.02 kg/ha with 19.23 per cent increase in pod yield over farmers practice which recorded mean pod yield of 2200.88 kg/ha (Table-1). The improved technologies recorded haulm yield of 5.73 t/ha with increase of 15.98 per cent compared to farmers practice (4.94 t/ha). Higher mean gross returns of Rs. 111107.23/ha and net income of Rs.56765.58/ha with an incremental Benefit: Cost ratio of 3.05was obtained with improved technologies in comparison to farmer's practices which recorded mean gross returns of Rs. 70940.88/ha and net returns of Rs.45193.08/ha (Table-2).

The results of front line demonstrations conducted at Ramanagara, Tumkur and Chikkaballapur districts during *Kharif* 2014-15 revealed that improved technology recorded higher mean pod yield of 1744.44 kg/ha with 22.33 per cent increase in pod yield over farmers practice which recorded mean pod yield of 1427.22kg/ha (Table-1). The improved technologies recorded haulm yield of 4.96 t/ha with increase of 13.88 per cent compared to farmers practice (4.36 t/ha). Higher mean gross returns of Rs. 57407.78 /ha and net income of Rs.36918.89 /ha with an incremental Benefit: Cost ratio of 2.78 was obtained with improved technologies in comparison to farmer's practices which recorded mean gross returns of Rs.47177.78 /ha and net returns of Rs.28416.67/ha (Table-2).

The results of front line demonstrations over three years indicated that improver technology with new variety Chintamni-2 (KCG-2)recorded higher mean pod yield of 2278.56 kg/ha with 20.43 per cent increase in pod yield over farmers practice which recorded mean pod yield of 1896.87kg/ha. The improved technologies recorded haulm yield of 5.29 t/ha with increase of 14.96 per cent compared to farmers practice (4.60t/ha). Higher mean net income of Rs. 58005.93/ha with an incremental.

Table 1: Productivity potential of improved technology (Variety: Chintamani-2(KCG-2) over three years

Sl. No.	Year	Technology Demonstrated	Name of the District	No. of Taluks	No. of Demonstrations	Area /demonstration(ha)	Pod yield (kg/ha)			Haulm yield (t/ha)		
							IT	FP	% increase over FP	IT	FP	% increase over FP
1	2012-13	Improved Variety: Chintamani-2 (KCG-2)	Kolar	02	06	0.4	2423.75	2000.00	21.03	5.00	4.50	11.30
			Chikkaballapura	02	09	0.4	2516.67	2125.00	18.43	5.33	4.50	18.75
			Total/ Average	04	15	0.4	2470.21	2062.50	19.73	5.17	4.50	15.03
2	2013-14	Improved Variety: Chintamani-2 (KCG-2)	Tumkur	02	02	0.4	2562.50	2200.00	16.54	5.75	4.85	18.19
			Chikkaballapura	03	13	0.4	2679.54	2201.77	21.93	5.71	5.04	13.77
			Total/ Average	05	15	0.4	2621.02	2200.88	19.23	5.73	4.94	15.98
3	2014-15	Improved Variety: Chintamani-2 (KCG-2)	Ramanagara	01	01	0.4	1850.00	1500.00	23.33	5.00	4.50	11.11
			Tumkur	01	03	0.4	1633.33	1333.33	22.43	4.57	4.00	14.17
			Chikkaballapura	04	06	0.4	1750.00	1448.333	21.23	5.33	4.58	16.36
			Total/ Average	06	10	0.4	1744.44	1427.22	22.33	4.96	4.36	13.88
	Grand Total/mean over the three years			15	40	0.4	2278.56	1896.87	20.43	5.29	4.60	14.96

Note: IT=Improved Technology
FP= Farmers practice

Table 2: Profitability of improved technology (Variety: Chintamani-2 (KCG-2) over three years

Sl. No.	Year	Technology Demonstrated	Name of the District	Cost of cultivation		Gross returns (Rs./ha)			Net returns (Rs./ha)			B:C ratio		
				IT	FP	IT	FP	% increase	IT	FP	% increase	IT	FP	% increase
1	2012-13	Improved Variety: Chintamani-2 (KCG-2)	Kolar	23125.00	21250.00	102000.00	84625.00	20.53	78750.00	62875.00	25.25	4.47	3.89	14.77
			Chikkaballapura	24000.00	21958.33	106750.00	90166.67	18.39	81916.67	67208.33	21.88	4.43	4.01	10.38
			Total/ Average	23562.50	21604.17	104375.00	87395.83	19.46	80333.33	65041.67	23.57	4.45	3.95	12.58
2	2013-14	Improved Variety: Chintamani-2 (KCG-2)	Tumkur	26250	24250	82125	70850	15.96	55875	46600	19.90	3.115	2.92	6.68
			Chikkaballapura	28920.31	27248.69	140089.46	71031.77	109.95	57656.15	43786.15	31.97	2.99	2.60	14.95
			Total/ Average	27585.15	25749.35	111107.23	70940.88	62.96	56765.58	45193.08	25.94	3.05	2.76	10.58
3	2014-15	Improved Variety: Chintamani-2 (KCG-2)	Ramanagara	21500.00	19500.00	60500.00	49500.00	22.22	39000.00	30000.00	30.00	2.81	2.53	11.07
			Tumkur	19916.67	18166.67	53566.67	44000.00	21.74	33983.33	25833.33	31.55	2.69	2.42	11.17
			Chikkaballapura	20216.67	18616.67	58156.67	48033.33	21.37	37773.33	29416.67	29.26	2.83	2.57	10.55
			Total/ Average	20544.45	18761.11	57407.78	47177.78	21.78	36918.89	28416.67	30.27	2.78	2.51	10.93
	Grand Total/mean over the three years			23897.37	22038.21	90963.34	68504.83	34.73	58005.93	46217.14	26.59	3.43	3.07	11.36

Note: IT=Improved Technology
FP= Farmers practice

Benefit: Cost ratio of 3.43was obtained with improved technologies in comparison to farmer's practices (Rs. 46217.14/ha).Similar types of results were reported by Naveen *et al*., 2017 [3] when demonstrated with new variety KCG 2. The increase in pod yield due to the suitable variety i.e., KCG 2 as compared to age old variety planted by farmers, beneficial influence of micronutrients viz., Zn and B through activation of various enzymes and basic metabolic rate in plants, facilitated the synthesis of nucleic acids and hormones, which in turn enhanced the pod yield due to greater availability of nutrients and photosynthates. These results are in agreement with the findings of Helpyati (2001) [2] and Sumangala (2003) [5] as they reported application of zinc enhances the plant growth enhancement through auxin and better dry matter production. Zinc improved dry matter production through the nodulation and N fixation by enhanced root growth and by activation of several enzyme systems and auxins. Whereas, boron influenced the nitrogen and carbohydrate metabolism of plants which might have contributed for the better plant growth. The frontline demonstrations conducted on field bean at the farmers' field revealed that the adoption of improved technologies significantly increased the yield as well as yield attributing traits of crop and also the net returns higher than the farmers' practices. This kind of opinion was also reported by Sandeep Suresh Patil *et al*., 2018 [4] as they say that the main reasons of the low yield of groundnut control plots in adopted villages were the use of poor quality seeds and traditional cultivation methods with poor nutrient and weed management practices. However, KVK scientists had used improved varieties of groundnut, seed treatment with Rhizobium, use of PSB and *Trichoderma*, adopted scientific cultivation practices like mulching and timely sowing, recommended spacing, balanced use of manure and fertilizers with time to time weed management for demonstration plots recorded 56.20% higher mean yield over a control plot mean yield. Hence, there is a need to disseminate the improved technologies among the farmers with effective extension methods like training and demonstrations. Farmers' should be encouraged to adopt the recommended package of practices for realizing higher returns.

Conclusion

The frontline demonstrations (FLDs) organized by the Agricultural Research Station, Chintamani had enhanced the groundnut pod yield and haulm yield with increased gross and net returns. This demonstration ensured rapid spread of recommended technologies with improved new variety Chintamani -2 (KCG-2) of groundnut crop horizontally. The FLDs on improved technology with KCG-2 made a positive and significant impact on pod yield of groundnut by increasing 20.43 per cent over the three years and ensured good profitability of improved technology by obtaining increased B:C ratio of 11.36 per cent. The FLDs showed a great impact on the use of improved varieties, with package of practices *viz*., application of recommended dosage of fertilizers, N,P,K, Gypsum, Micronutrient mixture (Zinc & Borax), *Rhizobium*, PGPR, Bio-control agent and timely weed management practices with assured irrigation and proper plant protection measures. In a nutshell, the overall trend in adoption of groundnut production technologies with improved variety Chintamani-2 (KCG-2) was increased in adopted villages.

References

1. Anonymous. All India *kharif* crop coverage report, Directorate of Economics and Statistics, Govt. of India, 2019.
2. Helpyati AS. Effect of moisture regimes and zinc levels on the growth and yields of summer groundnut. Karnataka J Agric. Sci. 2001; 14(2):451-453.
3. Naveen NE, Chaitanya HS, Patil SU, Dhananjaya B. Impact of Front Line Demonstration on Productivity of Groundnut in Farmers Fields of Coastal Karnataka Udupi District. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107. 2017; 9(37):4561-4562.
4. Sandeep Suresh Patil, Mahesh Mavanjee Mahale, Sudeshkumar Shivajorao Chavan. Impact of Frontline Demonstrations (FLDs) on Oilseed Crops in South Konkan Coastal Zone of Maharashtra, Curr. Agri. Res. 2018; 6(3):355-364.
5. Sumangala BJ, Response of groundnut (*Arachis hypogaea* L.) to conjunctive use of micronutrients and bio-inoculants at graded levels of fertilizers under dry land conditions. Ph.D. Thesis, Univ. Agric. Sci. Bangalore, 2003.