AATCC Review

17 September 2023: Received
10 November 2023: Revised
24 January 2024: Accepted
13 February 2024: Available Online

www.aatcc.peerjournals.net

Research Article Open Access

Sequential Extension Methodology for Augmentation of Higher Yields in Soybean through Cluster Front Line Demonstrations at KVK Nizamabad, Telangana State

C. Padma Veni[1], M. Swetha[2], P. Vijay Kumar[3], B. V. Raj Kumar[4]

[1]Department of Agricultural Extension Education, College of Agriculture, Rajendra Nagar, PJTSAU, Hyderabad, India.
[2]Subject Matter Specialist, Agril. Extension, KVK, Nizamabad, India.
[3]Subject Matter Specialist, Plant Protection, KVK, Nizamabad, India.
[4]Subject Matter Specialist, Horticulture, KVK, Nizamabad, India.

ABSTRACT

Oilseed production assumes great importance in India. Among oilseed crops, rapeseed & mustard is the third most important group of oilseed crops in the world after Soybean and palm oil. The Nizamabad district is the second major district in the area and production of soybean crops in Telangana state. Most of the soils in Nizamabad district are red and black soils with sandy loam texture. Major Kharif crops grown in the study area are rice, soybean, maize, sugarcane, etc the present study was conducted by following sequential extension methods in conducting CFLD oilseeds under NMOOP with Basara variety which has been developed and released by PJTSAU, Hyderabad. The study was focused on a combination and sequence of extension methods to reach the farmers and persuade them to adopt the scientific technology package in soybean through cluster mode. The technologies were demonstrated right from land preparation to the marketing of the produce against the check i.e. farmer's practice. Under CFLD Demonstration farmers have received a 16.35 percent yield increase over check and a 2.36:1 B: C ratio. To achieve these results KVK, Rudrur has adopted the sequence of extension methodology like Participatory Rural Appraisal (PRA), Brainstorming sessions, Surveys, Interaction with Principal Scientist (Oil seeds) & Literature development and distribution to the farmers Orientation meeting, Critical input (Seed) distribution, Demonstration on sowing with a seed drill, Field visits & Interaction meetings, Timely Agro advisories, Training Programmes on crop production and plant protection aspects, Field Day and documentation of feedback, Demonstration on mechanized harvesting, a Training program on post-harvest management and marketing, Facilitating in the marketing of the produce and linking with buyers to get good price Linking the farmers to a source of good quality seed. Well-designed Sequential Extension Methodology and Technology to reach Research output to the farmers through Extension is the need of the hour. Successful implementation of extension activities like Cluster Front Line Demonstrations through KVKs contributes to the income security of the farmers.

Keywords: *Sequential Extension methods, CFLD Oil seeds, Soybean, Basara variety, etc.*

Introduction

India is endowed with a wide variety of agro climates and soils that enable the cultivation of a variety of oilseed crops. In the agricultural economy of India, oilseeds are next only to food grains in terms of acreage, production, and value. Oilseed production assumes great importance in India because of the huge gap in demand and supply which resulted in the import of vegetable oil worth millions of rupees every year. Among oilseed crops, rapeseed and mustard are the third important group of oilseed crops in the world after soybean and palm oil.

As soybean is mostly grown as the kharif crop with the onset of monsoon in a rainfed agro- ecosystem where uncertainty in the rainfall pattern (onset, amount, frequency, dry spells) is high, the soybean acreage varies significantly from year to year. Crop acreage estimation using traditional practices are very time consuming, labour intensive and expensive. Moreover, these method Soybean is an exceptional crop among oilseeds attaining an unparalleled glory of horizontal expansion in a very short span of nearly four decades [1]. Soybean is mostly grown as the *kharif* crop with the onset of monsoon in a rainfed agro-ecosystem where uncertainty in the rainfall pattern (onset, amount, frequency, dry spells) is high. The soybean acreage varies significantly from year to year. Crop acreage estimation using traditional practices are very time-consuming, labor intensive, and expensive.

The Nizamabad district is second major district in area and production of soybean crop in Telangana state. The study area is situated in the northern Telangana zone with 18°40' N latitude and 78°06' E longitude. Total geographical area percent agriculture area in total geographical area of the district. The Godavari river separates the Nizamabad district from Maharashtra state in the west direction. The Nizamabad lies on 393m above sea level Nizamabad has a tropical climate, and most of the rainfall received from June to the Nizamabad district is second major district in area and production of soybean crops in Telangana state. The study area is situated in the northern Telangana zone with 18°40' N latitude and 78°06' E longitude. A total geographical area is about 4,288 sq.kmwith 22 percent

Corresponding Author: **AAAAAAAA*

DOI: https://doi.org/10.58321/AATCCReview.2024.12.01.220

agriculture area in total geographical area of the district. The average annual rainfall is about 1108 mm. The average maximum temperature is about 46.1°C (115°F) and the average minimum temperature is about 18°C (64°F). Most of the soils in the Nizamabad district are red and black soils with sandy loam texture. Major *kharif* crops grown in study area are rice, soybean, maize, sugarcane etc. In the study area, soybean is grown in rainfed condition. In year 2019, most of the soybean crop areas were planted late (mid-July) due to delayed onset of the monsoon. This led to the late senescence and therefore, the harvesting of soybean crop in study area.

The productivity of Soybean in Telangana State is very low, nearly 1-1.5 tons per ha.Therefore concerted efforts were required to enhance its productivity. Improved agricultural technologies are the products of modern science which lead to ultimate sustainable production. In spite of the availability of improved crop production technologies, the adoption of recommended production technologies among farmers was not very encouraging. The average productivity of soybean in the state was very low as compared to the potential yield. The reason might have been that most of the technologies have not yet reached to the farmer's field. Hence, to percolate the scientific know-how amongst soybean growers and to have direct interaction with farmers, ICAR proposed to undertake a project on frontline demonstration through NMOOP in a mode of cluster approach.

The main objective of Cluster Frontline Demonstration (CFLD) on Oilseeds under NMOOP through extension centers like KVKs and State Agricultural departments is to demonstrate the productivity potentials and profitability of the latest and improved soybean production technology under real farm conditions. Keeping this in view, Cluster Frontline Demonstrations (CFLDs) on oilseeds were conducted under the NMOOP scheme on soybeans to enhance the area, production and productivity of soybeans with improved technology in Nizamabad district.

Process of agricultural technology transfer is done through two basic stages. The first one is the transfer and dissemination of agricultural technology to farmers and thesecond one is to convince farmers to adoptthese technologies on their farms.

No one method is entirely used to get acceptance and adoption of agricultural technology, several extension methods may be employed while other methods could be combined with ease. The combination and sequence of extension methods are important means of accelerating the transfer of agricultural scientific and technological achievements and promoting the development of agricultural modernization among the farming community.

An effective extension communication system is necessary for the effective transfer of technology and to render extension service to achieve its broad-set goal of farmers acquiring knowledge, skill and attitude and in overall, better their economic strength and standard of living. With this background, the present study was conducted by following sequential extension methods in conducting CFLD oilseeds under NMOOP.

Methodology

Krishi Vigyan Kendra, Nizamabad conducted a need analysis of farmers and demonstrated the high-yielding soybean technology through Cluster Frontline demonstrations (CFLDs) under the NMOOP scheme during *Kharif* seasons in the farmer's field during the 2017-18 and 2018- 19 by the active participation of farmers. Improved high-yielding soybean variety Basar (ASb-22) developed by the Agricultural Research Station, Adilabad, PJTSAU was distributed to the farmers. A total of 83 demonstrations (50 and 33 demonstrations during 2017-18 and 2018-19 respectively) in 33.2 have the improved technologies of soybean to establish production potentials and expand the area under the crop with this variety based on its suitability for the district. Farmers practice (JS 335) as check was selected. Pre-sowing pieces of training were organized by involving the selected farmers on soybean crop management practices. Critical inputs along with technology to be demonstrated at every stage of the crop were delivered with appropriate training.

Sequential Extension Methodology and Technology

Technology transfer was done with the help of sequential extension methodology for effective dissemination. For the development of Sequential Extension Methodology and Technology, the following were considered.

- The sources of growth in farmer's income
- Strategies for improving the farmers' income through sequential
- extension methodology, selecting improved technology and improved variety
- Increasing resource use efficiency
- Saving the cost of cultivation
- Increasing cropping intensity
- Different stages of CFLD before and during implementation
- Various crop stages
- Crop technologies with appropriate extension methods
- Audio-visual aids/ ICT and
- Farmers feedback

Before the implementation of CFLD

Selection of Demonstration plots and farmers

Participatory Rural Appraisal Methods like Social and Resource mapping and transact walks were conducted to identify uplands suitable for the promotion of oilseed crops. Brainstorming and Interactive sessions were conducted and suitable demonstration plots on cluster approach along with interested and ideal farmers based on their active participation were selected. Accordingly, 83 farmers(83 Demonstration plots) were selected in 2017-18 and 2018-19 in 33.2 ha under CFLD Soil Samples from the selected demonstration plots were collected in coordination with the Department of Agriculture, Nizamabad and distributed the Soil Health Cards for soil test-based fertilizer management.

During the implementation of CFLD

An orientation meeting was held and literature on improved technologies in soybeans to the demonstration farmers. Critical inputs were supplied along with technology to be demonstrated at every stage of the crop by following appropriate extension methods. Proper Audio Visual Aids and obtaining farmers' feedback at every crop stage were followed. Video films were shown farmers to impart knowledge on timely management of pests and diseases and other crucial crop management aspects. At the maturity stage, a field day were organized by involving demonstrations holding farmers, neighboring farmers, scientists from the University and Agricultural Technology Application Research Institute, officials from the Department of Agriculture, local extension functionaries, and press and media to demonstrate the superiority of the technology to the other

farmers by demonstration holding farmers and documented the feedback. Crop yields were recorded from the demonstration and check plots at the time of harvest to identify the yield gaps between the demo and check plots. The yield data was collected from both the demonstration and check plots by random crop-cutting method for comparison.

Fig : Sequential Extension Methodology and Technology

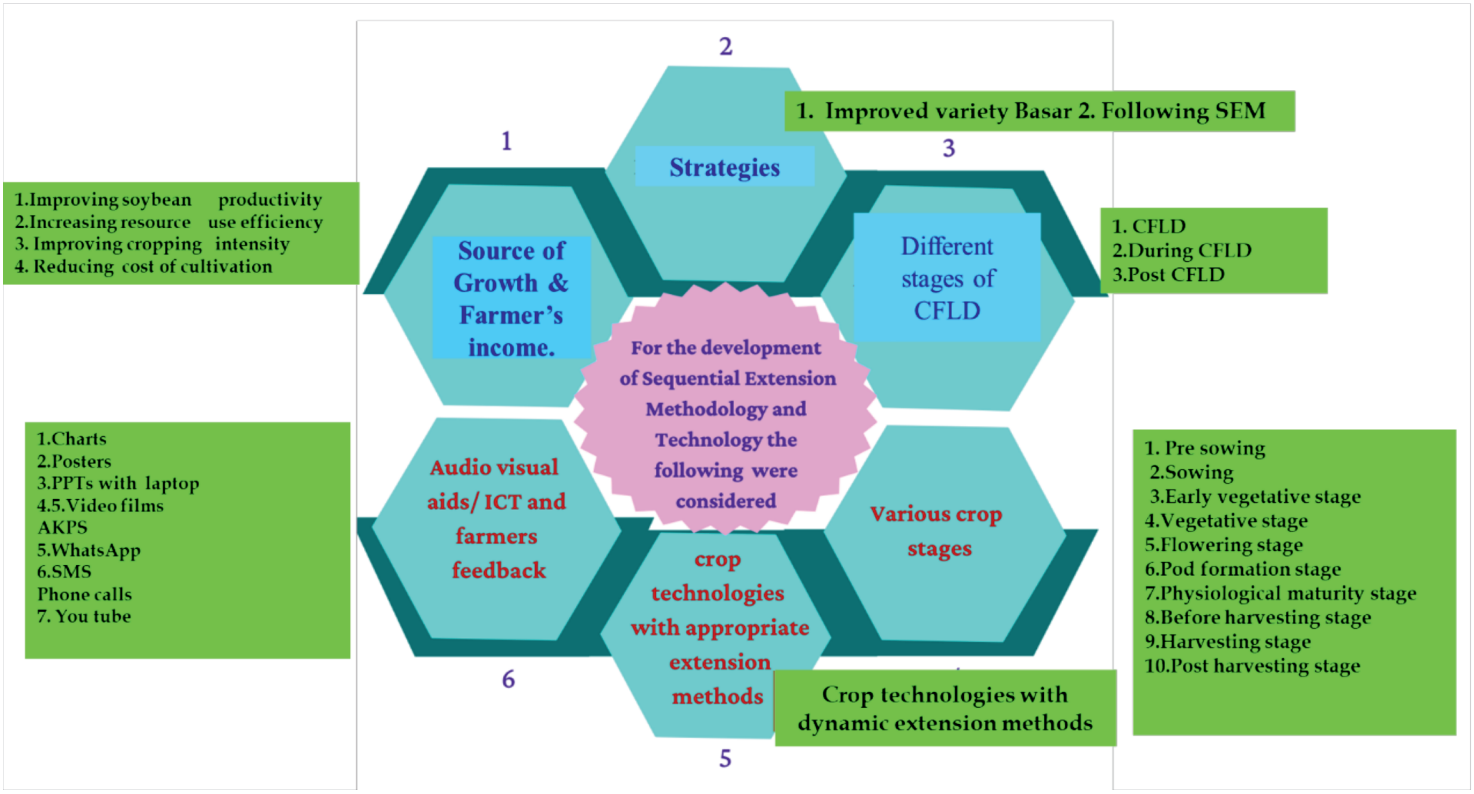


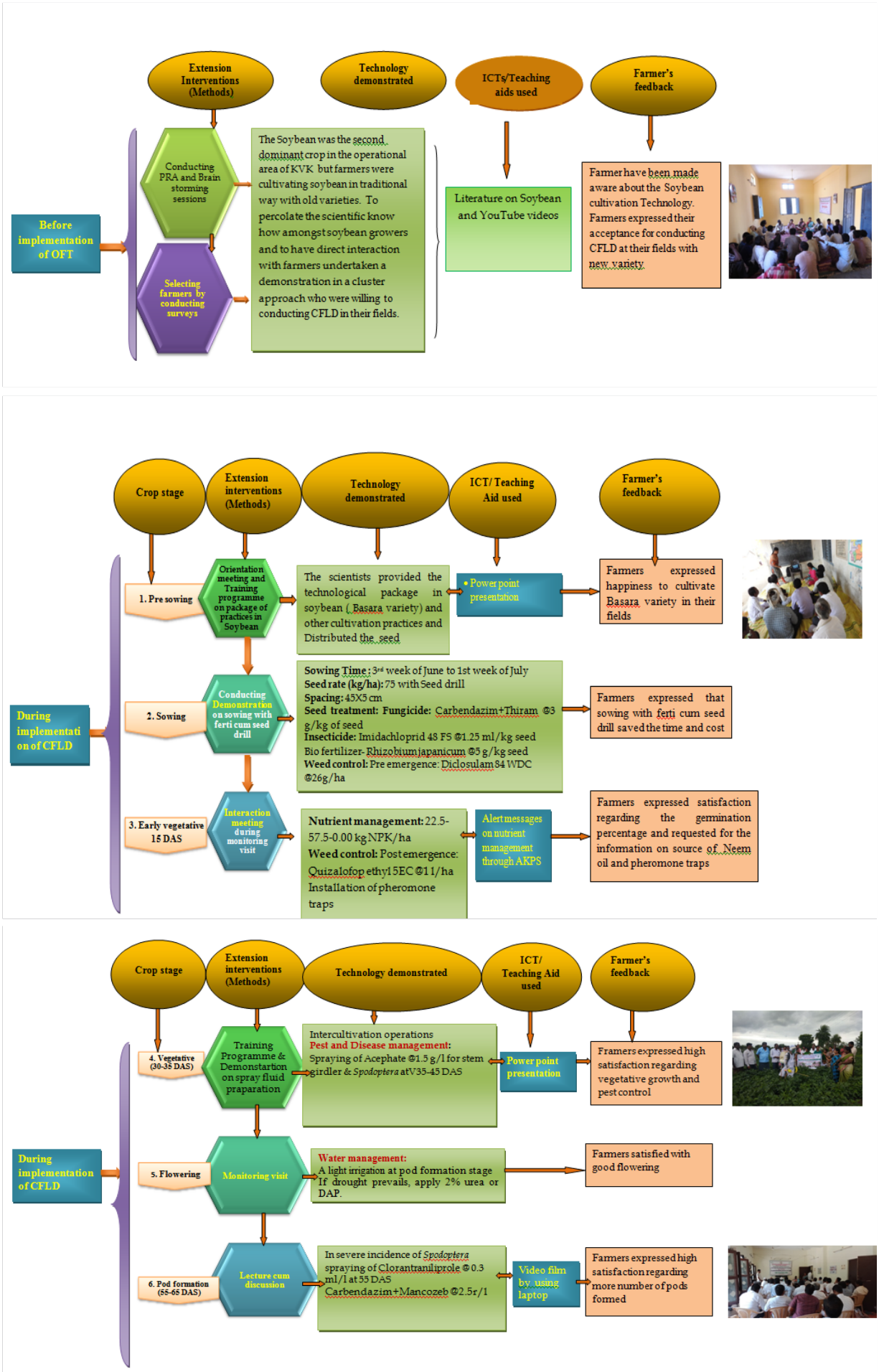
Table 1: Technology followed in conducting CFLD in soybean

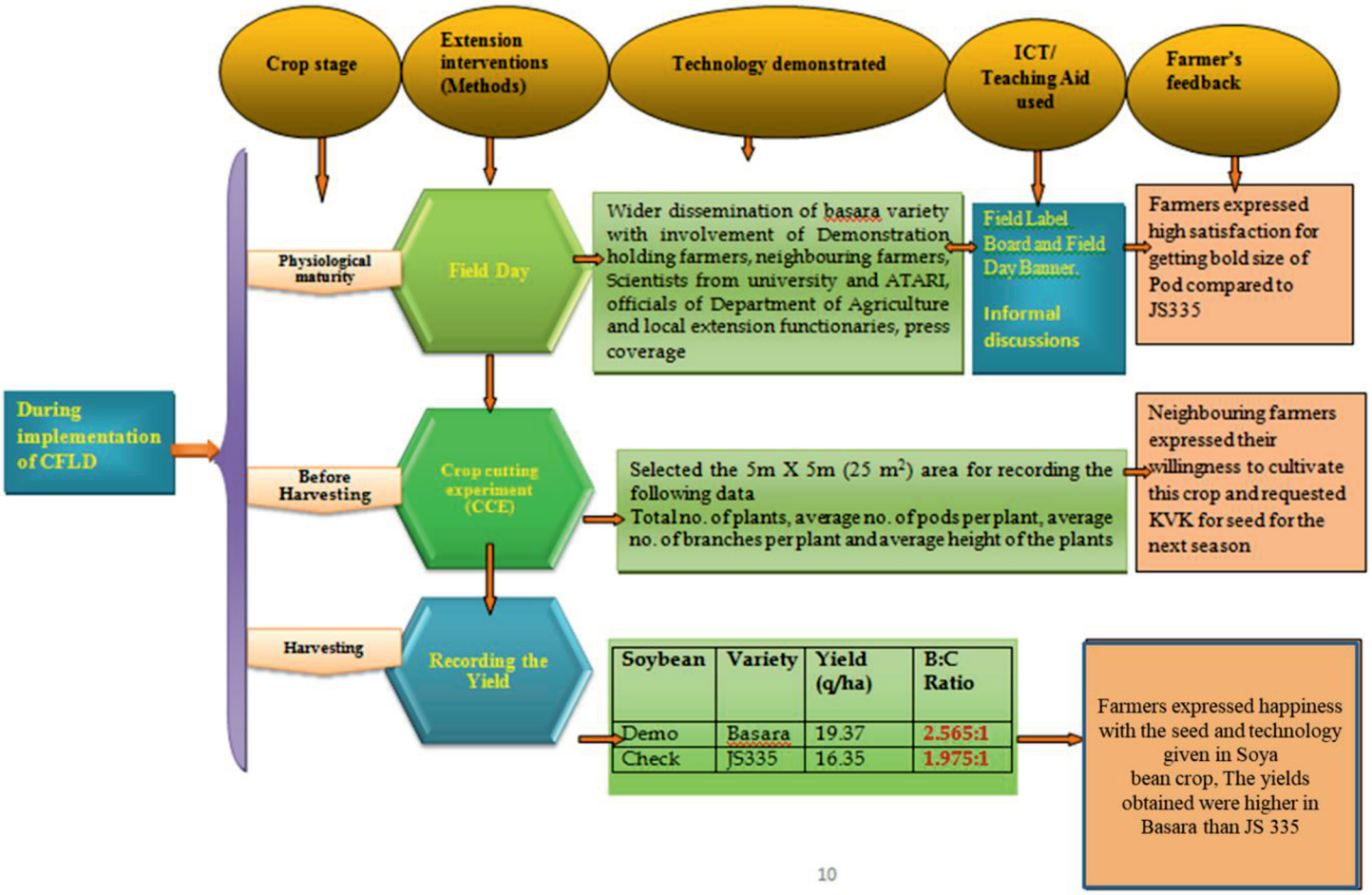
Practice	Technology	Farmers Practice
Variety	Basar (ASb-22)	JS 335
Duration	110-115	95-100
Sowing Time	3rd week of June to 1st week of July	3rd week of June to 1st week of July
Seed rate (kg/ha)	75	100
Sowing method	Seed drill	Seed drill/Dibling
Spacing	45X5 cm	30X10
See treatment	**Fungicide:** Carbendazim+Thiram @3 g/kg of seed **Insecticide:** Imidacloprid 48 FS @1.25 ml/kg seed Biofertilizer- Rhizobium japanicum @5 g/kg seed	Fungicide: Carbendazim+Thiram@ 3g/kg of seed
Fertilizers	22.5-57.5-0.00 kg NPK/ha	22.5-57.5-0.00 kg NPK/ha
Weed control	Pre-emergence: Diclosulam 84 WDC @26g/ha Post-emergence: Quizalofop ethyl 5EC @1 l/ha	Pre-emergence: Pendimethalin 30EC@3.25L/HA
Pest control	Application of Carbofuran 3G granules@8kg/acre against stem fly at 15-20 DAS Spraying of Acephate @1.5 g/l for stem girdler &*Spodoptera* atV35-45 DAS, in severe incidence spraying of Clorantraniliprole @ 0.3 ml/l at 55 DAS	Application of indiscriminate use of insecticides in an untimely manner
Disease control	Carbendazim+Mancozeb @2.5r/l	

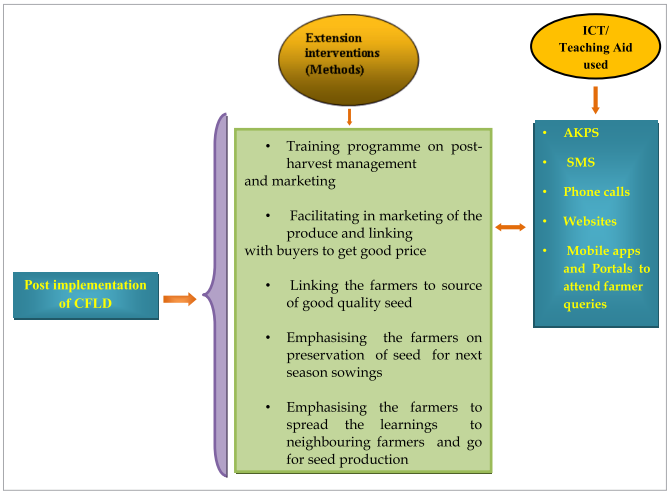
Table 2: Performance of Soybean yield under CFLD demo and Check during Kharifseason 2017-18 and 2018-19

Name of the Variety/ Hybrid		No. of Farmers	Area (ha)	Yield (q/ha)			% Increase in yield	Economics of demonstration (Rs./ha)				Economics of check (Rs./ha)			
				Demo											
Domo	Check			High	Low	Average	Check	Gross Cost	Gross Return	Net Return	BCR (R/C)	Gross Cost	Gross Return	Net Return	BCR (R/C)
Basar (ASb-22)	JS-335	50	20	20.625	15.625	18.025	15.75	14.5	28076.5	54976.5	26900	1.96:1	29188	46463	17275	1.59
		33	13.2	21.75	19.7	20.7	17.5	18.2	23286	73950	50664	3.17:1	25900	61200	35300	2.36:1
Mean		41.5	16.6	21.1875	17.6625	19.3625	16.625	16.35	25681.25	64463.25	38782		27544	53831.5	26287.5	

Fig. 2 a Model of Methodology and Technology Integration







Extension methods selected and adopted:

1. Participatory Rural Appraisal (PRA)
2. Brainstorming sessions
3. Surveys
4. Interaction with Principal Scientist (Oil seeds) & Literature development and distribution to farmers
5. Orientation meeting&
6. Critical input (Seed) distribution
7. Demonstration on sowing with the seed drill
8. Field visits and interaction meetings
9. Timely Agro advisories
10. Training Programmes on crop production and plant protection aspects
11. Field Day and documentation of feedback
12. Demonstration on mechanized harvesting
13. Training programme on post-harvest management and marketing
14. Facilitating in marketing of the produce and linking with buyers to get good price
15. Linking the farmers to sources of good quality seed

Before Implementation of CFLD

ICTs & Aids - Literature

During Implementation of CFLD

ICTs & Aids – AKPS, SMS, Phone calls, technology display boards

After Implementation of CFLD

ICTs & Aids – AKPS, SMS, Phone calls, Websites, Mobile apps and Portals

Conclusion

The effort of KVK, and Rudrur in conducting CFLD on Oilseeds with Soybean crops integrating appropriate technology and Sequential Extension Methodology enabled the farmers to improve productivity, resource use efficiency, and saving cost of cultivation which indirectly contributed to enhancing their income. Well-designed Sequential Extension Methodology and Technology to reach Research output to the farmers through Extension centers is the need of the hour. Successful implementation of extension activities like Cluster Front Line Demonstrations through KVKs contributes to the income security of the farmers.

References

1. Dupare, B. D., Billore, S. D. and Verma, S. K. 2012.An analytical study of seed scenario at farmers' level in major soybean growing states.*Soybean Res.* 10: 93-98.

2. Tai, H.2012.Improve the management of dissemination of agricultural technology programs in Iraq. *The Euphrates Journal of Agricultural Sciences.* 12 (1): 241- 256.