

KRISHI VIGYAN KENDRA, AMBALA

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I. Direct Seeded Rice: The way forward for farm mechanization and resource conservation

INTRODUCTION

Rice (*Oryza sativa* L.) is one of the most important crops in India, covering an area of about 43.97 mha with the total production and productivity of 104.32 mt and 2.37 t/ha, respectively during 2011-2012. While the average productivity of rice in India, at present, is 2.2 tons/ha, which is far below the global average of 3.7 tons/ha. India is expected to surpass its demand by the year 2030, if the rice production grows at 1.34% per annum. But it will remain in deficit of around 2.5 million tons, if the present growth rate of 1.14% continues up to the year 2030.

The water use for rice has been reported as 1560 mm in Haryana. The increased use of groundwater for rice cultivation has led to a decline in the water table by up to 1 m per year. Therefore, the increasing water scarcity threatens the productivity and sustainability of the irrigated rice system in India in general and Haryana in particular. Ambala is the North-Western district of Haryana with 1.55 lakh ha geographical area and 1.35 lakh ha net cultivated area. Moreover, the net irrigated area of Ambala is approximately 1.10 lakh ha, out of which 85 % and 15 % is being irrigated by tubewells and canals respectively. The average annual rainfall of the Ambala district is 1076 mm, which is mainly received in monsoon season (July-September). Rice-wheat is the dominant cropping system, while sugarcane is also the major cash crop of Ambala. In Ambala, rice is grown over 0.83 lakh ha area and average productivity is about 38 qtl/ha, which is largely grown by manual transplanting of seedlings into puddled soils.

The fine grain basmati varieties i.e. CSR-30 and PUSA-1121 have more cropped area than coarse grain varieties in Ambala-1 block of Ambala district. The basmati varieties, because of their long duration, consume a lot of water and more susceptible to the attack of diseases and Bakanae (foot rot) in particular. Direct seeded rice technology can save more water as compared to TPR and similarly labor requirements can also be reduced. Direct seeded rice also helps in improving soil physical properties, which is beneficial for the wheat and other crops grown before or after rice. Therefore, not only the net income but also the higher system productivity can be achieved through DSR.

As DSR provides a major opportunity to change production practices to attain optimum plant density and high water productivity specially in groundwater scarce areas. Keeping in view the above benefits of direct seeded rice, the Krishi Vigyan Kendra (KVK), Tepla-Ambala initiated the adoption of technology since 2009. During the year 2009 to 2015, we have conducted several the FLDs, OFTs, Trainings, Travelling Seminar & Publications, news coverage's, exhibitions were done to popularize the labour & water conservation technology of rice cultivation & details are given below

KVK intervention: During the year 2009, we have sown the Pusa-1121 variety with Zero-till seed-cum-fertilizer drill at KVK farm. Earlier farmers were not aware about DSR but through extension activities, promotion of technologies in Technology Week farmers started taking interest in 2010. Since year 2010 we have conducted the FLDs on 27 ha area in different blocks of Ambala. The farmers who heard from the other farmers, news papers and other sources, about the benefits of the direct seeded rice, they came to KVK & asked about the steps involved in cultivation of direct seeded rice. We conducted training programmes for the farmers in their villages and they were motivated to learn by doing.

Table 1: Extension activity efforts by KVK to promote DSR technique in Ambala

Particulars	PF Trainings	EF trainings	Method demo	Exposure visits
Numbers	10	5	12	5
Participants	114	93	96	100

For the dissemination & horizontal expansion of the technology, we have imparted one extension functionaries training during the season in each year since 2010. The field staff of different agricultural departments such as PACL Company, Department of Agriculture, Assistant agricultural engineering, Cooperative societies, were trained on different aspects of DSR. They were trained and familiarized with different aspects of direct seeded rice right from the laser-leveling of the field, seed drill calibration, treatment of seeds, method and time of sowing and nutrient, irrigation & weed management etc.

As the KVK, Tepla is working collaboratively with CSISA/CIMMYT on the front of Resource Conservation Technology. Therefore, time to time during the DSR season, the interested farmers from Ambala district were sent to see the trial and research sites of the CSISA. By organizing such kind of exposure visit/ travelling seminar, the farmers believe by seeing & learn by interacting with the farmers on different aspects of direct seeded rice cultivation. The KVK published a pamphlet titled “**Sanshadhan Sarankshan Teknikya**” and were distributed to the farmers during Training, Exposure Visit/Travelling Seminar & in-service training programmes. KVK also popularized this technique through popular articles in news papers and quarterly magazine etc.

Output: Realizing the potential of the CA based management systems in water depleting area of Ambala, systematic work on dry direct seeded rice (DSR) was initiated jointly by KVK Ambala and CSISA program, which was run jointly by IRRI and CIMMYT. As the DSR technology is new to the Ambala district and still a lot of trials & research are to be conducted by various stakeholders involved under this programme, no major breakthrough regarding effective weed control as in case of DSR has been achieved, as all the weeds in DSR are different from the weeds in TPR. Yield under DSR and TPR is almost equal but from the point of view of natural resource conservation, DSR technology has shown a new light to address the challenges of water and labour shortages, soil degradation and emerging climate variability and uncertainty. DSR method not only saves water and labour but also reduces cost of cultivation and thereby increases benefit cost ratio over TPR. DSR is a vital part of sustainable Agriculture which is the topic of common debate among the scientists & policy makers. Sustainable Agriculture is the demand of today & tomorrow (i.e. future year). In brief, no sustainable agriculture, no future of ours.

Outcome: As in traditional transplanting rice (TPR), the farmers are dependent on the labour & regular water supply (electricity). The whole work depends on the migrant labour, if the transplanting is delayed then the productivity of both rice & Wheat got affected. Due to KVK intervention on the direct seeded rice, the farmers have understood the ill effects of puddling and know the benefits of DSR as it saves water and labour. DSR technique reduced the cost of cultivation by 3000 to 5000 Rs/ha as compared to TPR (Table 2). Even the less yield of rice under DSR the B:C ratio of the DSR is higher than the TPR. We have also observed that in DSR technique require 20-25 % less water as compared to the traditional puddled rice. The labour use in man-h/ha are also approximately 10 percent less in DSR as compared to TPR (Table 3).

In addition to this, the timely harvesting of paddy particularly fine grain basmati varieties Pusa-1121 & CSR-30, also beneficial for timely sowing of the wheat. The less compactness of the field under DSR was also observed. The survey of farmers under DSR claimed that the wheat yield was 5-10 % higher when

wheat was grown on DSR plot. This practice increases the yield by 5 to 10 % & higher profits. It means the DSR technique is solving the problems of labour, water & productivity of whole system.

Table 2: Comparison of yield and economics in DSR and TPR methods in paddy (Pusa-1121)

Year	cost of cultivation (Rs/ha)		yield (qtl/ha)		Gross return (Rs/ha)		Net return (Rs/ha)		BCR	
	DSR	TPR	DSR	TPR	DSR	TPR	DSR	TPR	DSR	TPR
2010	20670	26110	29.50	32.50	61950	68250	41280	42140	3.0	2.6
2011	22560	25150	40.10	41.00	68170	69700	45610	44550	3.0	2.8
2012	25500	27800	42.75	41.50	94050	91300	68550	63500	3.7	3.3
2013	28000	31000	40.50	41.25	127575	129938	99575	98938	4.6	4.2
2014	28500	32700	39.15	40.50	133110	137700	104610	105000	4.7	4.2
2015	30000	33000	37.85	40.00	98410	104000	68410	71000	3.3	3.2
Average	25872	29293	38.31	39.46	97211	100148	71339	70855	3.7	3.4

Table 3: Average labour use under DSR and TPR methods of paddy (In man-h/ha)

Treatments	Labour use in tillage	Labour use in nursery raising	Labour use in sowing/transplant-ing	Labour use in weeding	Labour use in irrigation	Other operations	Total Labour use
	2013-14	2013-14	2013-14	2013-14	2013-14	2013-14	2013-14
DSR	8	-	5	90	190	780	1082
TPR	10	25	150	10	220	780	1182

Impact: Earlier, the farmers were not convinced, but through the extension activities such as: FLDs (front line demonstrations), trainings, travelling seminars, method demonstrations, printing material and media, this technology was disseminated among the farmers of Ambala gradually they started believing this technology. This technology was started with 0.4 ha in 2009, which increased to about 25 ha in 2011, 1010 ha in 2013, Which is slightly less in year 2014 i.e. 955 ha. Due to joint efforts of other concerned agricultural agencies, the area during year 2015 has been increased to approximate 1100 ha. As the horizontal expansion area table (Table 4.) shows, the area under DSR is expanding year by year and momentum is likely to be caught in the coming years. In 2012, various other government bodies i.e. Department of Agriculture, Ambala; Assistant Agricultural Engineering deptt., Ambala and private seed companies have accelerated the movement and now more than 10 direct seeding drills are available in Ambala.

Table 4: Adoption of DSR technique in Ambala

Year	Area (ha.)			
	At KVK Farm	Under Demon.	At Farmers Field	Total
2009	0.4	-	-	0.4
2010	0.4	3.6	4	8
2011	1.6	3.6	20	25.2
2012	2.0	3.6	220	225
2013	2.0	7.2	1000	1010
2014	2.0	3.6	950	955
2015	2.0	3.6	1100	1105.6

NEEDS

Weeds, if not managed timely, may reduce yield. Therefore, apply suitable herbicides timely to ensure the control over weeds. Sustainable integrated weed management technologies/strategies need to be developed, because weeds are the major threats to the direct seeded rice. Improved varieties suitable for aerobic conditions with early vigor, short duration and disease resistant must be developed for its wide scale adoption.

Photographs



2. Self Employment through Broiler Farming: A Success Story of Sh. Manpreet Singh

INTRODUCTION

India has made tremendous progress in broiler production during last three decades. Broiler production has been more vibrant than layer production within the poultry sector with an annual growth rate of 11.14 percent, production of 3.725 million tons and employment of 4.29 million people in the country. India is the fourth largest producer of poultry meat in the world valued at US \$ 6.6 billion.

KVK Intervention: KVK, Tepla organized the training on Poultry Farming for unemployed rural youth and also conduct OFTs/FLDs and other extension activities to enhance the production potential of the poultry industry ultimately better economic returns.

Sh. Manpreet Singh S/o Sh. Swarn Singh, Village Machhonda, Education +2 slanders searched the KVK through internet for poultry training. He was influenced by his family to start some own business related to livestock. Sh. Manpreet visited KVK and got training in poultry farming in the month of October, 2015. He started with 5000 day old chicks of broiler at his farm. The KVK intervention continues in providing day old chicks, equipments technical know-how, health coverage and assured marketing to support such a progressive farmers. He added coriander seed powder in broiler feed under FLD programmes. With his own capability, enthusiasm and KVK intervention now he has become one of the progressive farmers in broiler farming within a short period of time.



Output: He reared these broiler chicks up to 5 week of age having an average of 2.25 kg body weight per bird and sold mature birds @ Rs. 74 per kg body weight. Sh. Manpreet Singh earned net profit Rs. 1.76 lakh from sale of 5000 birds. This success has been achieved distinctively over the short period of time in a sustainable manner.

Outcome: Sh. Manpreet Singh continuously rearing of good flock of broiler and earning a sizable income which aids significantly to the livelihood of the family. Sh. Singh, who was getting boredom, now his life is very active and his family gives him all support.

Impact: Looking at this success more number of unemployed educated youth have been motivated to take up poultry training. He has been a source of inspiration for local youth in and around. Sh. Manpreet Singh has also provided full time employment to a family at his farm. Now he has planned to construct one more poultry house with capacity of 10,000 birds.

III. Case Study – Sh.Harpreet Singh

Personal Information

Personal information				
Name of the farmer/ entrepreneur	HARPREET SINGH			
Date of Birth	11.09.1985			
Education	10+2			
Farming Experience/ Experience in enterprise	5 years			
Cell no./ e-mail	9416960382			
Full address	Village & Post Office, Kesri, Ambala			
Professional membership (Farmer club/SHG/ATMA/etc.)	Organization	From (Year)	To (year)	Position held, if any
1	NA			
Awards received	Level (State/District/etc.)	Year	Name (details for which awards was given)	
1	NA			

Professional Information

Enterprise(s)	Dairy Farming
Cropping pattern	Rice-Wheat
Problem statement (problems faced by the farmer before and while running the enterprise(s))	1. Repeat breeding problem in the herd 2. Mastitis 3. Sale of Milk 4. Labour
KVK Intervention(s)	1. Training on Dairy farming 2. Frequently farm advisory services 3. Improved variety of green fodder provided 4. Exposure visit of the farmers at NDRI, Karnal
Major Innovation(s), if any	NIL
Details of Practices followed by the farmer	After training Sh. Harpreet Singh having improved crossbreed cows and murrah buffaloes and structured the animal house in scientific manner. Growing improved varieties of green fodder.
Results/ Impact (economical/ social/ etc.)	Increased annual income of the family and milk available for local people
Factors contributing to success	Adopting new technology and innovations of dairy farming
Future plans	Establishment of processing unit for preparation of milk products like Dahi, Paneer, Icecream

Economic Information (about different enterprises over last 5-7 years)

Enterprise	Gross Income (annual)	Net income	Cost-Benefit ratio	Economic Impact of technology/intervention (cost saving/ higher yield/etc.)
Dairy Farming	18,95,000	7,21,000	1.48	• Improved fodder varieties reduced the cost of feed. • Fodder conservation (Silage Making) save the cost of fodder cultivation & labour etc. • Scientific housing management increased the milk yield of the herd. • Regular deworming and washing the teat before and after milking increased the good health of the herd. • Formulated balanced ration resulting increase in milk production



Herd of crossbreed cows

IV. Case Study (Garments Stitching & Body Care)

Introduction

Women's economic empowerment is widely recognized as essential to national development, both to advance gender equality and to reduce poverty levels. To achieve these goals various efforts have been made by KVK, Ambala by organizing training programmes for Rural women so as to start their own enterprises and earn their livelihood.

There is a farm woman "Miss Pooja" who proved that: Women work is not only restricted to household level or as food provider in home but can work as economic provider and a dynamic community leaders. She is earning her livelihood through small entrepreneurial unit i.e. Garment Stitching and Body Care Centre". She is 22 years old , matric pass belongs to SC community of village Sambhalkha, district Ambala (Hry.)

She came in contact with KVK, Ambala in the year 2009 and got trained herself in various skill based training programmes and participated in extension activities. In 2010 she upgraded her knowledge from DRDA Ambala and Mission 21 Foundation Organization in 2013.

After she developed the skill in various trainings she had decided to start small entrepreneurial unit on Garment stitching alongwith Body Care. She had worked as a trainer in different villages in collaboration with organization (Mission 21 Foundation, Yamunanagar). She had opened her own Shop (rented) in the year 2015 where she run Parlor as well as Stitching Center and earn her livelihood (Rs.4500/-p.m.) in Saha.



Personal Information

Name of the farmer/ entrepreneur	Miss Pooja Rani D/o Sh.Dhani Ram			
Date of Birth	29-11-1993			
Education	Matric			
Farming Experience/ Experience in enterprise	6 years (Stitching Centre & Beauty Parlour)			
Cell no./ e-mail	9466009569			
Full address	<u>Residence</u> : Miss Pooja Rani D/o Sh.Dhani Ram VPO: Sambhalkha-133001, District : Ambala (Hry.)			
Professional membership (Farmer club/SHG/ATMA/etc.)	Organization	From (Year)	To (year)	Position held, if any
1 NGO	Mission 21 Foundation, Yamunanagar	2013	2015	Trainer
2	--	-	--	--
3				
Awards received	Level (State/District/etc.)	Year	Name (details for which awards was given)	
1	--	--	--	
2				
3				

Professional Information

Enterprise(s)	Garment Stitching & Body Care		
Cropping pattern	--		
Problem statement (problems faced by the farmer before and while running the enterprise(s))	Loan facilities no available and are unawared		
KVK Intervention(s)	1. Trainings provided:		
	Dated	Title	Venue
	01.05.2009 to 31.07.2009	Stitching	KVK
	30.05.2009 to 01.06.2009	Fruit & Vegetable Preservation	KVK
	26.09.2011 to 04.10.2011	Empowerment of SHG Women through Art & Craft	KVK
	30.08.2014	Training on Food Processing (ni-msme,Hyderabad)	KVK
	2. Guidance for putting stalls in Melas , Technology Week etc. 3. Help in establishment of Entrepreneurial Unit 4. Organise lectures in Sr. Sec. School, Sambhalkha. (Art & Craft) 5. Participation in Exposure visits i.e. “Innovation Market Place at Global Conference on Women in Agriculture” at New Delhi etc. 6. Interaction & experiences sharing among SHG members during “Mahila Diwas Programme organized at KVK 7. Linked with DRDA & NGOs for skill upgradation		
Major Innovation(s), if any	--		
Details of Practices followed by the farmer	--		
Results/ Impact (economical/ social/ etc.)	<u>Social Recognition :</u> 1. Empowering unemployed rural women of nearby villages by giving skill based trainings in Garment stitching and Body Care 2. Imparting guest lectures among school children to make them skilled in creative work like : Rakhi making, , decorated items, candle making, soft toys making and flower making etc. <u>Economical Impact :</u> 1. Horizontally transfers the skill of garment stitching & Body care and earned income of Rs.4500/-p.m.(approx.) 2. Established own entrepreneurial unit : Shiv Beauty Parlour & Garment Stitching Centre”in the year 2015 3. Earn approx. Rs. 1000/p.m. as a trainer for Mission 21 Foundation, Yamunanagar (Upto 2015)		
Factors contributing to success	- Regularly visiting KVK for upgrading the knowledge & skills - Regular in touch with other Beauty Parlours in the area - Bold , confident & Self dependent		
Future plans	- Extend work - Open Boutique for designing of garments		

Economic Information (about different enterprises over last 5-7 years)

Enterprise	Gross Income (annual)	Net income	Cost-Benefit ratio	Economic Impact of technology/intervention (cost saving/ higher yield/etc.)
Garment Stitching & Body Care Centre	96,000.00	48,000.00	--	Horizontally transfers the skill of garment stitching & body care and earned income of Rs. 4500/month (approx.)

KRISHI VIGYAN KENDRA, AMBALA

Photographs



Certificate Courses attended by Miss Pooja



Beauty Parlour (Shop)- A success of Miss Pooja



Art & Craft training



Honored by Govt. Sr.Sec.School,Sambhalkha



Hon'ble Minister Kumari Shelja interaction with small entrepreneurs



Participation in KVK Exhibition (QRT Visit)



Exposure Visit at Global Conference at New Delhi



Active participation in OFT/FLD



Various certificates related trainings & experience in Stitching & Body Care

Case Study – IV (Sh.Ashwinder Singh)



Ashwinder Singh S/o Amrik Singh

Village: Hema Majara
Block: Barara

Post: Mullana
District: Ambala



Personal profile

Age: 34

Education: B.A

Land holding: 25 Acre

Farming Experience: 5 Year

Cropping system

1. Rice – Wheat - Sugarcane
2. Rice – Mustard - Sugarcane
3. Rice – Sugarcane + Onion + Popular (Three tire cropping system)
4. Rice – Potato – Onion
5. Rice – Wheat – Mungbean (Cropping intensity)



DESCRIPTION OF FARM

The name of Mr. Ashwinder Singh of village Hema Majara of Mullana area in Ambala district is well known as a most successful progressive farmer of the District. He is doing farming with closely liked with KVK since the last 5-6 years. He has adopted different cropping system with multi-tier cropping system for profitability and scalability of vegetable production. He grows 'diversified crops' like Rice-Wheat, Sugarcane, Mungbean, chilly, cauliflower etc. and 'multi-tier cropping system' like Rice – Sugarcane + Onion + Popular. Step by step he extended in his intensive farming activities with expected returns and visible economic upliftment. Today, he is the pride owner of 15 acre of agricultural land. He is well supported by his family members in farming activities. Today the traders are making Bee-line to his farm to purchase his pride produces like potato, chilli, cole crops, mustard, garlic, onion etc. This year, he is going for seed production of wheat through the KVK suggestion.

He was adjudged best Progressive Farmer Award-2014 by Krishi Vigyan Kendra, Ambala and played an important role in several trainings as like Active participation in Technology Week-2014, interaction with scientists in SAC meeting-2015 and participated in skill upgradation on food processing –sponsored by Ni-msme, Hyderabad. He was also rewarded several times by several organizations as a mark of recognition of his successful farming carrier.

Table 1: Economics of the farmer

Name of crops	Area (Acre)	Input cost (Rs/acre)	Net income (Rs/acre)
Rice	10	10230	28970
Wheat	14	8990	22910
Sugarcane	4	42675	57075
Mustard	4	3980	27400
Onion	1.5	34730	35270
Potato	1.5	27465	22535
Mungbean	4	1200	Green manuring
Popular	14	7050+2250+2250	-

Constraints:

- > Sale price of vegetables, cash crops and other horticultural products should be fixed and their marketing should be made easy.
- > High prices of advanced machineries for new technology methods as like happy seeder, bed planter etc
- > Legumes crop destroyed by animals attack

Suggestions:

- > Available custom hiring facilities for advanced technology machine
- > Sell price of crop should be fixed price policy
- > Farmer is no need fertilizer subsidy but also should be on diesel subsidy only for farmer according land holding

