

Original Research Article

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## Impact of Front Line Demonstration on the yield of Niger

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### ABSTRACT

#### Keywords

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The present study was conducted to investigate the costs involved and returns obtained from the cultivation of niger and compare the performance of niger variety JNS-9, JNS-6, JNS-28 with the local variety of farmer in the district Chhindwara. The demonstration were conducted by Zonal Agricultural Research Station at the farmers fields of many villages during the kharif season from 2014-15 to 2017-18 in district Chinawara of Madhya Pradesh. The average yield of FLD was 489.25 Kg/ha as compared to farmers practices 194.5 Kg/ha. The average yield increased 152.2 per cent over farmer's practices during the four years. The result indicated that the front line demonstration has given a good impact over the farming community of the district about 545 Kg/ha. The farmers of the district have been motivated by the improved agriculture technologies applied in the FLD these findings are in corroboration with the finding of many others.

### Introduction

Niger (*Guizotia abyssinica* L.f cass) is an important minor oilseed crop grown in Tropical and Subtropical countries like India, Ethiopia, East Africa, West Indies and Zimbabwe. India ranks first in area, production and export of niger in the world. Niger seeds contain about 40% edible oil with fatty acid composition of 70-80% linoleic acid, 7-8 % palmitic and steric acids, and 5-8% oleic acid<sup>4</sup>. Niger is an important oil seed crop, the seed which is pale yellow with nutty taste and pleasant odour. Its keeping quality poor due to high content of unsaturated fatty acids. The oil of niger crop is very deficient in India. It is suitable for rainfed condition. The main objective of FLD was to show the worth

or value of the technology. Hence, this is a challenging task for the scientist and farmers under such condition it is quite imperative that reasons for the technological gap in niger should be identified and studied critically in order to face the existing challenge of low productivity. In this context the present study has been undertaken to evaluate the difference between demonstrated technologies vis a vis practices followed by the local farmers in niger crop.

### Materials and Methods

The present study was conducted to investigate the costs involved and returns obtained from the cultivation of niger and compare the performance of niger variety

JNS-9, JNS-6, JNS-28 with the local variety of farmer in the district Chhindwara. The demonstration were conducted by Zonal Agricultural Research Station at the farmers fields of villages like, Rajdhana, sajkuhi, vijaydhana, dhagadia, jhilpuriya, jhabuadhana, gonavadi, aamdhana, karanpuriya, mohoria and bilwarkala during the kharif season from 2014-15 to 2017-18 in district Chinaware of Madhya Pradesh. During four years of study, an area of 34 ha. Was covered under front line demonstration with active participation of total 85 farmers (Table 1).

Before conducting FLD's a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different aspects of cultivation. Niger variety JNS-28, JNS-9 and JNC-6 was demonstrated on total area of 34 ha. Similarly, equal numbers of control plots were also laid. In FLD's emphasis was given on use of improved agronomical practices including proper seed rate, seed treatment, blanced fertilizer and plant protection etc. the data were collected from both FLD plots as well as plots of farmers using their traditional practices. Finally the extension gap, technology gap along with the benefit cost ratio were worked out. The technology gap, extension gap and technology index were calculated using the following formula.

Extension gap = Demonstration yield - farmers practices yield.

Technology gap = Potential yield of variety – Demonstration yield.

Technology index (%) =  $\frac{\text{Technology gap}}{100/\text{Potential yield}}$

## **Results and Discussion**

The average yield of FLD was 489.25 Kg/ha as compared to farmers practices 194.5 Kg/ha. The average yield increased 152.2 per cent

over farmers practices during the four years. The result indicated that the front line demonstration has given a good impact over the farming community of the district about 545 Kg/ha. The average highest yield has been recorded during 2014-15 year, while the average yield was 199.0 Kg/ha in farmers practices during the year 2017-18. The farmers of the district have been motivated by the improved agriculture technologies applied in the FLD these findings are in corroboration with the finding of many others (Table 2 and 3).

### **Extension gap**

The average extension gap 294.5 Kg/ha has been found during this period while the average highest extension gap 359 Kg/ha was recorded during the year 2014-15. This emphasized the need to educate the farmers through different means for the enhancement of adoption of improved technologies to reverse this trend of wide extension gap use of innovation production technologies with high yielding varieties will subsequently change this alarming trend to extension gap.

The results of technologies will ultimate lead to the discussion of farmers to discontinue the old technology to adopt the new technology.

### **Technology gap**

The average technology gap was 148.2 Kg/ha during the four years, while it was highest 274 Kg/ha during the year 2017-18. The minimum technology gap has been recorded 93 Kg/ha during the year 2015-16.

The observed technology gap may be attributed dissimilarly in soil fertility status, rainfall distribution, disease and pest attack as well as the change in the location of demonstration plots every year. The differences in technology gap during different years could be due to more feasibility

of recommended technologies during different years.

### Technology index

The technology index for all the demonstrations during different year were in accordance with technology gap. The highest technology index per cent of 42.15 was recorded in the year 2017-18 and the lowest was observed in the year 2015-16 which is 15.5 per cent.

The technology index shows the feasibility of the evolved technology at the farmers fields and the lower the value of technology index more in the feasibility of the technology.

### Economic analysis

The input and output prices of commodities prevailed during the demonstration were taken for calculating gross return, cost of cultivation, NMR and benefit cost ration. Use of pricy seeds for crops sowing date, sowing method, seed treatment, seed rate, recommended dose of fertilizer, proper pest management etc, all of these are the main reasons for high cost of cultivation in demonstration fields than local check. Therefore, the average cost of cultivation of 4 years increased in demonstration practices 8421 Kg/ha as compared to farmer practices 4750 Rs/ha (Table 4).

**Table.1** Detail of Front Line Demonstration conducted during 2014-2018

S.No	Year	No. of farmer	Conducted FLD	Area (ha.)
1	2014-15	10	10	4
2	2015-16	25	25	10
3	2016-17	25	25	10
4	2017-18	25	25	10
Total		85	85	34

**Table.2** Details of package of practices followed under FLD vs. Farmers Practices

Particulars	Front Line Demonstration	Farmers Practices
<b>Varieties</b>	JNS-9, JNC-6 & JNS-28	Local Variety
<b>Sowing time</b>	IInd week of July to IInd week of Aug	-
<b>Sowing method</b>	Line Sowing	Broadcast Method.
<b>Seed treatment</b>	Seed treatment with fungicide Carbendazim 5g/Kg or <i>Trichoderma viride</i> 10g/Kg of seed before sowing	No seed treatment.
<b>Weed management</b>	By hand hoe/bullock drawn blade at an interval of 15 days commencing from 15-20 DAS.	-
<b>Thinning</b>	Thinning should be done 15 DAS for maintaining plant population.	-

**Table.3** Seed yield and gap analysis of FLD's on niger at farmers field

Year	No. of FLD's	Variety	Potential yield (Kg/ha)	Demonstration yield (Kg/ha)	Farmers Practices (kg/ha)	increase yield (%)	Extension gap (kg)	Technology gap (kg)	Technology index (%)
<b>2014-15</b>	10	JNS-9	650	545	186	193	359	105	16.5
<b>2015-16</b>	25	JNC-6	600	307	195	160	312	93	15.5
<b>2016-17</b>	25	JNS-28	650	529	198	167	331	121	18.6
<b>2017-18</b>	25	JNS-28	650	376	199	88.9	177	274	42.15
Average			<b>637.5</b>	<b>489.25</b>	<b>194.5</b>	<b>152.2</b>	<b>294.75</b>	<b>148.25</b>	<b>23.17</b>

**Table.4** Economic analysis of demonstration plots and farmers practices in Niger

Year	Cost of cultivation (Rs/ha)		Gross Return (Rs/ha)	Net Return (Rs/ha)		B:C Ratio		
	IT	FP		IT	FP	IT	FP	
<b>2014-15</b>	8671	4500	24525	8370	15854	3870	2.82	1.86
<b>2015-16</b>	8671	4500	32955	10400	24284	5900	3.80	2.31
<b>2016-17</b>	8671	4500	27508	10296	18897	5796	3.17	2.28
<b>2017-18</b>	7671	5500	18790	9932	11119	4432	2.45	1.81
Mean	<b>8421</b>	<b>4750</b>	<b>25944.5</b>	<b>9749.5</b>	<b>17538.5</b>	<b>4999.5</b>	<b>3.06</b>	<b>2.06</b>

The cultivation of niger crop under improved technology gave average higher net return of Rs. 17538.5/ha as compared to farmers practices Rs. 4999.5/ha. The average B:C ratio of niger under improved technology was 3.06 as compared to 2.06 under farmers practices.

The above results showed that the integration of improved technology along with active participation of farmers has a positive effect in increase the seed yield and economic return of niger crop production. The suitable technology for enhancing the productivity of niger crop and need to conduct such demonstration may lead to the improvement and empowerment of farmers. The demonstration traits also enhance the relationship and confidence between farmers and ZARS scientists. The recipient farmers of FLD's also play an important role as source

of information and quality seeds for wider dissemination of the improved varieties of niger for other nearby farmers. It is concluded that the FLD's programme is a successful tool in enhancing the production and productivity of niger crop through changing the knowledge, attitude and skill of farmers.

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