

Impact of Front Line Demonstrations on Productivity of Carrot in Tirap District of Arunachal Pradesh

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INTRODUCTION

Carrot (*Daucus carota* L.) is one of the most important cool weather root crop is grown all over the world. In India, the important carrot growing states are Uttar Pradesh, Assam, Karnataka, Andhra Pradesh, Punjab and Haryana. It is the second and third most important vegetable in England and Australia, respectively. It can be grown also in mild climate of the tropics. Carrot had 0.064 million ha area with the production of 0.968 million tons during 2017-18. Being a rich source of beta carotene, a precursor of vitamin-A. It also possesses anti-oxidant properties, fix up harmful free radicals and prevent heart diseases. It is generally consumed as a vegetable after cooking but also consumed fresh in salad, juice and served as an ingredient in soups and sauces. Tender roots are processed to make pickles, jam, candy and jellies. It is also used as an additive in poultry feed to intensify skin and egg yolk colour. The carrot variety Pusa Rudhira suits to this region. Front Line Demonstration was carried out at the twenty farmer's field at Tirap district of Arunachal Pradesh. Here generally in winter's minimum temperature goes to 8-9°C and in summer maximum temperature reaches to 36°C. Annual rainfall is 1500-2000 mm per year.

The present study was conducted in Tirap district of Arunachal Pradesh during 2017-18. The good quality seeds of carrot cv. Pusa Rudhira were procured and distributed to twenty selected farmers. All the selected farmers were trained on various aspects of carrot production technologies before conducting of demonstration through training. The field was prepared by ploughing and harrowing after kharif crops. The seeds were sown in well prepared field during second week of November. All the recommended practices i.e. seed treatment by fungicide, spacing, recommended dose of manure and fertilizers, weed management, insect pest management were provided to the farmers in both treatments (local check and Pusa Rudhira).

The data related to cost of cultivation, production, productivity, total return and net return were collected in both treatments as per schedule from all selected farmers. An average of cost of cultivation, yield and net returns of different farmers was analyzed by the formula.

$$\text{Average} = [F1 + F2 + F3 + \dots + F_n] / N$$

F1 = Farmer

N = No. of Farmers (4)

In the present investigation, technology index was operationally defined as

the technical feasibility obtained due to implementation of Front line Demonstrations in Carrot. To find the technology gap, extension gap and technology index following formula used by [3] have been used.

$$\text{Technology Gap} = P_i (\text{Potential Yield}) - D_i (\text{Demonstration Yield})$$

$$\text{Extension Gap} = D_i (\text{Demonstration Yield}) - F_i (\text{Farmers yield})$$

$$\text{Technology index} = [(P_i (\text{Potential Yield}) - D_i (\text{Demonstration yield})) \times 100] / P_i (\text{Potential yield})$$

Performance of FLD

Table-1 Yield, technology gap and technology index of demonstration

Variables	Yield (q/ha)	Increase of yield over check (%)	Technology gap (q/ha)	Technology index (%)
Local check	198.84	-	-	-
Demonstration	236.26	18.81	37.42	13.74

A comparative study of productivity levels between demonstrated variety and local check is shown in Table 1. During the period of Study, it was observed that front line demonstrations, the improved carrot variety Pusa Rudhira recorded the higher yield (236.26 q/ha) than local check (198.84 q/ha). In percentage; 18.81 higher over local check. These findings are proving that improved varieties performance reported better over the local check under similar environmental conditions. The other farmers were motivated by seeing the results in term of productivity. The yield of the front line demonstrations and potential yield of the crop was compared to

estimate the yield gaps which were further categorized into technology index.

The technology gap shows the difference between potential yields over demonstration yield of the technology. The potential yield of the technology (variety Pusa Rudhira) is 330 q/ha. The technology gap 32.42 q/ha was recorded. The front line demonstration was laid down under the supervision of KVK specialist at the farmers' field; there exist a gap between the potential yield and demonstration yield. This may be due to the soil fertility and weather condition. Hence, location specific recommendations are necessary to bridge the gap.

Table-2 Economics of front line demonstrations

Variables	Cost of cultivation (Rs.)	Gross return (Rs.)	Net return (Rs.)	Benefit cost ratio
Check	52,000	1,65,000	1,13,000	3.72
Demonstrations	58,000	2,08,000	1,50,000	4.11

Technology index shows the feasibility of the variety at the farmer's field. The lower the value of technology index, more is the feasibility of the particular technology. The result of study depicted in Table 1 revealed that the technology index value was 13.74. It means the technology carrot cv. Pusa Rudhira is suitable for the Tirap district of Arunachal Pradesh.

Economics of carrot production under front line demonstrations was recorded and the results of the study have been presented

in Table 2. The results of economic analysis of carrot production revealed that front line demonstration recorded higher gross return (Rs./ ha 2,08,000) and net return. (Rs.1,50,000) with higher benefit cost ratio (4.11) as compared to local check. Further, additional cost of Rs. 2000 per ha in demonstration has increased additional net return Rs. 26142 per ha with incremental benefit cost ratio 13.74 suggesting its higher profitability and economic viability of the demonstration.

