



Demonstration on Cabbage Production with Using Organic Sources of Nutrition in Tirap District of Arunachal Pradesh

Abhimanyu Chaturvedi^{1*},
Praveen Kumar Mishra²

¹SMS (Horticulture), K.V.K.
Tirap - Deomali,
Arunachal Pradesh

²SMS (Horticulture), K.V.K.
Masodha-Kumarganj,
Ayodhya Uttar Pradesh



*Corresponding Author

Abhimanyu Chaturvedi*

Article History

Received: 11. 03.2023

Revised: 19. 03.2023

Accepted: 23. 03.2023

This article is published under the terms of the [Creative Commons Attribution License 4.0](https://creativecommons.org/licenses/by/4.0/).

INTRODUCTION

In India the total area under cabbage production is 413 million ha with total production of 9606 million tones. The top three highest producing states of India are- Odisha (1130 million tons), Madhya Pradesh (797 million tonnes), Assom (744 million tonnes), Bihar (721 million tons) and Chhatisgarh (420 million tons). The total area of the Arunachal Pradesh is 440 ha and production is only 5.64 million tones. The Arunachal Pradesh is a state which maximum population is engaged in agricultural & allied activities for their livelihood. The topography of Arunachal Pradesh is undulating, and being a forest dominating state, its soil property is too good as compared rest of the country. And the Tribal person of the state does not like to consume any commodity/produce which grown by using chemical fertilizer.

The ideal soil pH ranges from 5.5 to 6.5 and soils with pH above 6.5 tends the leaves to become dark and leaf margins die back. It is used as fresh salad or either consumed as cooked vegetable or other processed products. The marketable head is a very good source of vitamin C, some B vitamins, potassium and calcium (Hasan & Solaiman, 2012 and Tiwari *et. al.*, 2003). Cabbage have been shown to protect against lung cancer, breast cancer and chemical influenced cancers due to the glucosinolates present in them (Traka *et al.*, 2010). The cabbage is a heavy nutrient feeder vegetable crop. Growth and yield of this vegetable crop is remarkably influenced by organic and inorganic nutrients management. So, more attention is needed for increasing organic matter content in the soil which is possible only by using more organic manures. Organic fertilizers enrich the soil organic matter, which improves soil structure or workability (soil tilth), making the soil easier to plough (sand and clay soils).

Therefore, the application of organic fertilizers assist structuring of soil to open and admit air penetration to roots and water drainage, both conditions necessary for satisfactory plant growth. However, there are many sources of organic manures in Arunachal Pradesh but among them rock phosphate, farm yard manure, cow dung, poultry manure, vermi-compost, tricho-compost are the most common.

The present investigation was conducted by Krishi Vigyan Kendra, Tirap at farmers’ field during the period 2018-19 and under the Frontline demonstration (FLD)

programme to disseminate and popularize the organic package of Cabbage cultivation (Assam Agricultural University, 2019) covering an area of 01 ha with 020 nos. of farmers. The villages selected for the study were - Lekhi, Namsang, Otonkhwa, Mopaya, Noitong, Turret and Subang. The soil selected under the treatments was a sandy loam with proper drainage facilities. The land was well ploughed and harrowed . The seed was sown in the nursery bed in the month of mid September and after 35 days, transplanting was completed in all the treatment plots. The management practices of the technology demonstrated and the farmers’ practice are elucidated in Table 1.

Table-1. The list of practices demonstrated and farmers practices

Particulars	Technology Demonstrated	Farmer’s Practice
Sowing time	20 October	October- November
Variety	Pusa Snoball	Non descript
Spacing	30 cm x 15 cm	20 cm x 10 cm
Manure and fertilizer	Manure @ 10 t/ha , soil application of Rock phosphate @ 375 kg/ha	Only manure @ 5-6 kg/m ² applied by farmers
Irrigation	2 Life saving irrigations	Rainfed
Plant protection	Spray of Neem based formulation	No applied any thing

Some of the parameters are taken into the study to determine the final yield of the technology demonstration plot against the farmers’ practice viz., Head size, head weight and canopy diameter and economic parameters like Gross cost, Gross return, Net

return and B:C ratio. Moreover to find the gap analysis some exercise have been worked out to calculate certain parameters like technology gap, extension gap and technology index by using the formulae as given below (Samui *et al.*, 2000).

$$\text{Technology gap} = \text{Potential yield} - \text{Demonstration yield}$$

$$\text{Extension gap} = \text{Demonstration yield} - \text{Farmers yield}$$

$$\text{Technology index} = \frac{\text{Potential Yield} - \text{Demonstration yield}}{\text{Potential yield}} \times 100$$

RESULTS AND DISCUSSION

Growth Parameters : It is clear from Table 2. that the head size, head weight, canopy diameter and maturity (13.97 cm, 1166 g, 41.21 cm and 81 days) of demonstration plots recorded superior over farmers practice (head size: 10.46 cm, weight: 842 g, canopy: 37.44

cm and maturity: 89.68 days). Canellas *et al.*, 2002 reported that the plant growth is related to humus content excreted by earthworm which contains humic acid and this finally helps in the plant growth and development. Similar results are also reported by Islam *et al.*, 2018.

Table :2. Effect of organic nutrients on growth aspects : -

Treatments	Head size (cm)	Head weight (g)	Canopy diameter (cm)	Maturity (days)
Demonstration	13.97	1166	41.21	81.00
Farmers practice	10.46	842	37.44	89.68

Gap Analysis

The results of yield gap revealed that (table no: 3) the demonstration plot recorded 180 q/ha yield as compared Farmers practice (134 q/ha). The technology gap is also recorded too high (45 q/ha); which indicated that the demonstration programmes should be carried out more years. The extension gap (46 q/ha) indicates that more efforts are to be done to educate and need

awareness about the concept and benefits of the organic cultivation among the farming community of the district. Lastly, the technology index (20%) which mean the technology is a feasible technology and can be easily accepted by the farmers because lesser the value of technology index, more feasible is the technology (Jeengar *et al.*, 2006).

Table No:3. Gap Analysis

Year	area	No of farmers	Yield (q/ha)			% increase	Tech.gap (q/ha)	Extensi on gap (q/ha)	Tech. index (%)
			P	D	FP				
2018-19	01	20	225	180	134	34	45	46	20

Where, P means Potential yield, D means Demonstration yield and FP means farmers practices yield

Economics

The data of Table no.4 clearly showing that that the maximum Gross return (Rs. 1,80,000), net return (Rs. 1,39,000/) and better

B:C ratio (3.39:1) was performed by the demonstrated technology as compared to the farmers practice (Rs. 1,34,000, Rs. 98,000/ and 2.72:1)

Table No: 4. Economics of Demonstration

Treatments	Gross cost (Rs.)	Gross return (Rs.)	Net return (Rs.)	B:C ratio
Demonstration	41,000	1,80,000	1,39,000	3.39:1
Farmers practice	36,000	1,34,000	98,000	2.72:1

Finally, it can be concluded that the application of Farm yard manure @ 10 t/ha + Rock Phosphate @ 375 kg/ ha can be opt against the practice followed by the farmers of Tirap district for better production; in

terms of getting higher yields and maximum benefits. Therefore, organic cultivation of cabbage will be the better option for the farmers to maintain sustainability and better productivity in the region.



Demonstration Photographs

REFERENCES

- Hasan, M. R. and Solaiman, A. H. M., 2012, Efficacy of organic and organic fertilizer on the growth of *Brassica oleracea* L. (cabbage). *Int. J. Agri. Crop Sci.*, 4 (3) : 128 - 138.
- TIWARI, K. N., SINGH, P. K. AND MAL, P. K., 2003, Effect of drip irrigation on the yield of cabbage (*Brassica oleracea* L. var. capitata) under mulch and non-mulch conditions. *Agric. Water Manag.*, 58 : 19 - 28.
- TRAKA, M., 2010, Broccoli consumption interferes with prostate cancer progression : Mechanisms of action. *Acta Horticulturae*, 867 (5) : 19 - 25.
- CANELLAS, L. P., OLIVERS, F. L., OKOROKOVA, A. L. AND FACANHA, R. A., 2002, Humic acid isolated from earthworm compost enhance root elongation, lateral root emergence and plasma membrane H⁺-ATPase activity in maize roots. *J. Plant Physiol.*, 130 (4) : 1951 - 1957.
- ISLAM, M., ISLAM, M. K., ALAM, M. J., MUNMUN, T. S., ISLAM, M. A. AND MONDAL, S., 2018, Effect of different sources of organic nutrients in combination with fertilizers on the production of cabbage. *Eco-friendly Agril. J.*, 11 (1) : 13 - 20.