RESEARCH NOTE

Knowledge and Adoption Level of Large Cardamom Cultivators of Anjaw District, Arunachal Pradesh

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ABSTRACT

A study entitled 'Knowledge and Adoption level of Large Cardamom Cultivators of Anjaw District, Arunachal Pradesh' was carried out to study the knowledge and adoption level of large cardamom cultivators. A structured interview schedule was developed to complete the study and 120 large cardamom cultivators were taken from 8 villages of two selected blocks of the district purposively. The overall knowledge index of the respondents was 40.98 per cent and the overall adoption index of the respondents was 25.68 per cent. It can be concluded that knowledge and adoption level of the respondents was low in the study area. There is an urgent need to intensify the extension service for bringing about best management practices so that maximum benefit can be accrued. It is also recommended that growers association and certified sapling nurseries may be established.

Keywords: *Large cardamom; Knowledge index; Adoption index; Constraints; Technical knowledge;*

Large cardamom is an important spice and a powerful flavoring agent with a distinctive smoky flavor. It is mainly cultivated in the sub-Himalayan region of the north-eastern Indian states, Nepal and Bhutan (*Sharma et al., 2009*).*Varadarasan and Biswas (2002)* recorded that the cultivation has also spread to northern part of Uttar Pradesh.

Commercial cultivation of large cardamom started in Arunachal Pradesh during the early 90's. The area and production of large cardamom is 16770 ha and 3101 tonnes (Directorate of Horticulture, AP). The average yield of large cardamom is 450 kg of dry capsules per hectare. The spice crop is grown in almost every district of Arunachal Pradesh. Major producing district are Lower Subansiri, East Siang, West Siang, Anjaw and Changlang. The cultivars cultivated in the state are Bharlangey (mid to high altitude), Golsey (low to mid elevation area), Ramla and Ramsey (higher altitude areas) and Sawney (highly adaptable, can be grown from low to high altitude areas). Bebo, Boklok, Jaker and Belak are the other cultivars found in the state.

Agriculture is the main source of livelihood for people of Anjaw district. Bestowed with a favorable climatic condition for the growth of large cardamom, Anjaw district is fast turning into the major producer of large cardamom in the state. As large cardamom turns out to be the most profitable cash crop in the district, residents are adopting in large scale. According to *Mody et al. (2012)* large cardamom is the main cash crop of Kaman and Tawra Mishmis of Anjaw district in Arunachal Pradesh. Commercialization of this spice is at a peak especially in Goiliang, Chaglagam, Hawai and Manchal circles of Anjaw district. The study district has registered annual production of large cardamom over 150.09 metric ton yielding revenue of 7 crores during 2011-12. The total area under large cardamom cultivation during the year 2013-14 was 332.40 ha (Directorate of Horticulture, AP). The government of Arunachal Pradesh has initiated number of training programmes and subsidies to encourage the commercial cultivation of large cardamom in the state, seeing its viability.

METHODOLOGY

The present study was conducted in Anjaw district of Arunachal Pradesh during December 2015 to March 2016. The selection of the study area was done

purposively based on presence of substantial number of large cardamom cultivators. The study area includes eight villages under two blocks of Anjaw district namely Chaglagam, Tarampa, Bomna & Meteiliang village under Chaglagam-Meteiliang CD block and Naraliang, Lamaliang, Braigong & Kasanglat village under Hayuliang-Goiliang CD block. A total of 120 respondents were selected for the study which constitutes 15 respondents from each village purposively. The data was collected with the help of structured interview schedule, group discussions and secondary sources for other information. The collected data were tabulated and analyzed using frequency, percentage.

RESULTS AND DISCUSSION

Knowledge level about recommended practices : In the study it was found (Table 1) that only (7.50%) of the respondents have knowledge regarding the elevation that large cardamom is suited best in elevation of 600 M above msl to 2350 M above msl and above. And it was found that (100%) of the respondents have knowledge that large cardamom cultivation is best suited in forest loamy soil. Though only (4%) of the respondent felt that FYM application is also necessary for better growth of large cardamom while other respondent felt that forest soil is fertile enough to sustain the growth and development.

The study also found that only (7.50%) of the respondents have knowledge about different type of cultivars like Bharlangey, Ramsey, Ramla, Sawney and Golsey. It was also found that zero per cent of the respondents were having knowledge that seed can be used for disease free planting. However (100%) of the respondents were having knowledge that suckers are used commercially as planting material. It was also found that (96.67%) of the respondents were having knowledge that suckers should be selected from robust, high yielding, and disease free mother plants only. The remaining respondents (3.33%) considered that all suckers are same.

Study revealed that all the respondents were having knowledge about the proper time of planting the sucker. However zero per cent of the respondents knew that planting of suckers can be delayed till May to avoid frost damage in higher elevation area. It was found that (85.53%) of the respondents were having knowledge that healthy suckers with one-two suckers should be planted in pits. However, only (12.50%) of the respondents knew about the recommended pits size and zero per cent of respondents were aware about the recommended FYM requirement per pit. It was also found that (41.67%) of the respondents were aware about the recommended planting distance.It was found that none of the respondents were having knowledge regarding the proper time for irrigation. The study also found that only (56.67%) of the respondents felt importance about the practice of shade regulation though all of them knows that large cardamom thrives well under the shade region.

The study showed that all the respondents have knowledge about the time of weeding and practice of roguing of weak and disease plants and gap filling. Further it reveals that only (8.33%) of the respondents knew about the mulching but none of the respondents were having knowledge that clean weeding practice is not advised. Cent per cent of the respondents have knowledge about the existence of the Foorkee disease and nature of loss that Foorkee disease causes but none had proper knowledge about the control measures to manage this disease and also the existence of aphids which acts as vector for this disease. It also reveals that (26.67%) of the respondents had knowledge about the disease called leaf spot. It further reveals that all the respondents have knowledge about the stem borer and (75.50%) of the respondents have knowledge about the leaf eating caterpillar. But none of the respondents were having proper knowledge regarding the control measure. It was also found that none of the respondents have knowledge about scientific manuring and fertilization practices.

It was also found that all the respondents have knowledge about the harvesting time, duration for first harvest and maturity indication. Though none i.e., (100%) of the respondents were not having knowledge about the practice to cut the maturity bearing tillers at a height of 30-40 cm from the ground and leaving it for one-two weeks so that colour of capsule can be enhanced. It was also found that (73.33%) of the respondents were having knowledge that proper curing fetches good price. However, it also reveals that only (50%) of respondents had known about the improved bhatti system and (100%) of the respondents were not having proper knowledge about the temperature and moisture content to be maintained for proper curing. It was also found that only (1.67%) of the respondents

Table 1. Knowledge level of individual respondent to the recommended practices (N=120)

Practices		No.	%
Elevation		9	7.50
Cultivars recommended as per elevation		9	7.50
Soil	Forest loamy soil.	120	100
	FYM application.	4	3.33
Propagation	Seed used for disease free planting.	0	0
	Suckers used for commercial purpose.	120	100
	Suckers should be selected from robust, high yielding disease free mother plant.	116	96.67
Planting season	April – June month.	120	100
	Delayed till May to avoid frost damage in higher elevation area.	0	0
Planting	Healthy suckers with 1-2 shoots in pits.	103	85.83
	Pit size 30x30x30 cm.	15	12.50
	FYM @ 1-2 kg per pit.	0	0
	Planting distance 150 x 150 cm recommended	50	41.67
	Irrigation required in dry months in September to March	0	0
Shade regulation	Performs well under partial shade condition.	120	100
	Tree species like Utis & Siris can be used as shade tree	0	0
	Shade regulation is important practice.	68	56.67
	Excess branches should be pruned to provide 35 % uniform shade.	0	0
Intercultural	Time of weeding.	120	100
operation	Roguing of weak and disease plants and gap feeling.	120	100
	Clean weeding is not advised.	0	0
	Mulching.	10	8.33
Disease	Foorkee disease.	120	100
	Phoma leaf spot disease.	32	26.67
Pest	Leaf eating caterpillar.	93	77.50
	Stem borer.	120	100
Manuring &	NPK @ 15:10:12 @ 200 gm per plant applied during April-May.	0	0
Fertilization	Fertilizer mixture of 20gm DAP and 15 gm MOP drenched twice per plant during April-May and Oct-Nov.	0	0
Harvesting	Harvesting is done during Nov-Dec at high altitude areas.	120	100
	First harvesting is done after 2 ½ years.	120	100
	When the seeds of top most capsules turn brown indicates the maturity stage.	120	100
	To enhance colour the maturity bearing tillers are cut at a height of 30-40 cm from ground and left for 1-2 weeks.	0	0
Curing	Proper curing is essential to fetch premium price in the market.	88	73.33
	Improved bhatti system.	60	50
	Temperature for proper curing should be between 50-55^{o}C in driers.	0	0
	Moisture content of cured capsule should be 10-13% for proper storage.	0	0
	Grading is done as chota dana and bada dana.	2	1.67
Storage	Properly dried capsule should be allowed to cool and then packed.	120	100
	Bags should be stored in dry raised platform to avoid moisture absorption.	120	100

had knowledge about the grading of large cardamom. It was found that all the respondents had knowledge about the method of storing the cured capsules.

Study reveals that (76.67%) of the respondents were under the medium knowledge level category forming the major segment followed by low knowledge level category with (15%) of respondents and high knowledge level category with (8.33%) of the

Table 2. Distribution of the respondents based on extent of adoption (N=120)

Practices	Extent of adoption					
	Fully		Partially		Never	
	No.	%	No.	%	No.	%
Adoption of recommended cultivars as per elevations	-	-	-	-	120	100
Following recommended propagation methods	33	27.50	83	69.17	4	3.33
Following recommended time of planting	120	100	-	-	-	-
Maintaining recommended plant to plant spacing	-	-	-	-	120	100
Adoption of recommended method of planting						
1-2 suckers per pit.	1	0.83	91	75.83	28	23.34
Pit size.	-	-	-	-	120	100
Irrigation management	-	-	-	-	120	100
Adoption of shade regulation	-	-	26	21.67	94	78.33
Following recommended intercultural operations	73	60.83	47	39.17	-	-
Adoption of phytosanitary measures for disease control	-	-	-	-	120	100
Adoption of mechanical method & proper sanitation for pest control	-	-	-	-	120	100
Using recommended chemicals, their concentration and time of spray for pest & disease control	-	-	-	-	120	100
Using recommended dose and time of fertilizers	-	-	-	-	120	100
Harvest						
Time of harvest.	68	56.67	52	43.33	-	-
Cutting the mature tiller.	-	-	-	-	120	-100
Following recommended curing method	-	-	-	-	120	100
Following recommended storage practices	40	33.33	80	66.67	-	-

respondents. The overall knowledge index of the respondents was (40.98%). Thus it can be concluded that knowledge level of the large cardamom cultivators was low in the study area.

Adoption of recommended practices: From Table 2, it reveals that (69.17%) of the respondents had adopted propagation method partially followed by (27.50%) of respondents who had adopted fully while (3.33%) of respondents had never adopted it. All the respondents have adopted the proper time of planting for planting new suckers in their field but none of the respondents had adopted the proper plant to plant spacing in the study area nor have they adopted the irrigation practice. The majority of respondents (75.83%) have adopted the method of planting 1-2 suckers partially followed by (23.34%) who had never adopted the practice while only (0.83%) of respondent had adopted fully. But it was also found that none of the respondents were actually practicing the recommended pit size for planting the suckers. It was also found that (78.33%) of the respondents have never adopted the shade regulation practice while only (21.67%) had adopted the practice of shade regulation.

Study also revealed that (60.83%) of the respondents had adopted intercultural operation fully like weeding in time, while (39.17%) had adopted it partially.

Study also found that all the respondents had never adopted the proper control measures and phytosanitary measures for disease control and pest control and none of the respondents adopted any chemical means of pest and disease control nor the recommended dose and time of fertilizer. It was found that (56.67%) of the respondent had adopted the proper time of harvesting the large cardamom while (43.33%) of the respondents have adopted it partially. But none of the respondents were found to adopt the practice of cutting matured tiller to enhance the colour of the capsule.

It was also found that (66.67%) of the respondents had adopted the storage practices partially while only 33.33 per cent have adopted it fully.

It was revealed that (75.83%) of the respondents were under the category of medium adoption level forming the major segment followed by (16.67%) of the respondents under the low adoption level category and (7.5%) under the high adoption level category. The

overall adoption index of the respondents was (25.68%). Thus it can be concluded that the adoption level of the respondents was low in the study area.

CONCLUSION

The present study was conducted to know more about the existing status of the knowledge level about the recommended cultivation practices and the adoption level of the cultivators in Anjaw district, Arunachal Pradesh. It was found that the knowledge and adoption level of the large cardamom cultivators were low. There is a huge gap of technical knowledge about pest and disease management and cultivation practices leading to non adoption of the recommended cultivation practices.

However, more studies are required to be conducted on a larger scale so as to make a proper assessment of the lacuna as well as the potential of this important cash crop. More studies of all the districts producing large cardamom should be conducted as the findings will help in framing the policies and recommendation which will eventually benefit the large cardamom cultivators. From the study undertaken it was observed that there is urgent need for intense extension work to be carried out with regard to the cultivation of large cardamom in the potential areas. Therefore it is recommended that the state government takes the necessary steps to fill this gap.

It was also observed that most of the respondents were working individually, therefore it is recommended that *Large Cardamom Growers Association* may be formed so that as a group the farmers will be able to put pressure on the government and other agencies for access to the facilities and the subsidies meant for them. Again as a group they will be able to sell their produce in bulk directly through auction in the main market.From the study it was also noted that there is an urgent need to establish certified sapling nurseries of large cardamom. Therefore the concerned government departments and other agencies may undertake the task of establishing the certified nurseries.

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