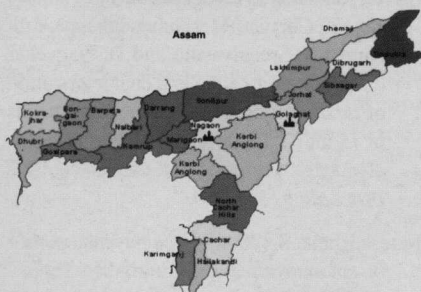


Status of coconut cultivation and strategies for improving the productivity in Assam

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Although Assam is not a traditional coconut growing state, expansion of coconut cultivation in the state is gradually increasing. The growers are taking interest in growing coconut in homestead gardens and also on a commercial scale.



Introduction

Coconut is a traditional plantation crop grown in India in 1.93 million hectares producing 12832.9 millions nuts per annum with a productivity of 6632 nuts per ha (2004-05)

Production and utilization of coconut in Assam

If we look at the coconut production and utilization scenario in Assam, it shows a dismal picture. In Assam farmers are growing coconut palm in their homestead garden commonly called as 'Bari system of cropping' under rainfed condition. In such a system, different crop combinations like coconut, arecanut, banana, fruit trees, timber trees, tuber crops and spices are being grown in an unscientific way without proper spatial arrangement and nutrient management. In most of the areas of this region, it is observed that almost every household is having two to five coconut palms in their homesteads. It is also observed that coconut palms are being planted around fish ponds. Commercialization of coconut plantation is yet to take place in Assam.

Coconut plays a very important role in the socio-cultural and economic life of Assam. In Assam, coconut harvesting is coincided with two big festivals i.e. *Magh bihu* (January) and *Durga Puja* (October). Generally people prepare or make many dishes/table items like *laddu*, *pitha*, *chira* etc. made of coconut. Coconut milk is a popular additive used for tea preparation in villages. The oil from copra is used for cooking and manufacturing soaps and other toiletries on a limited scale. The tender coconut and cut pieces of copra are being sold in railway stations and other places.

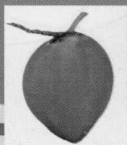
Status of coconut research in Assam

Though coconut research was initiated in Assam way back in 1957 by the Department of Agriculture, Government of Assam, full fledged coconut research was initiated only in the middle of 1980 at Horticultural Research Station (HRS), Kahikuchi, Guwahati under Assam Agricultural University. Coconut research work was further strengthened with the introduction of All India

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Co-ordinated Research Project on Palms (AICRP) in the year 1985 at HRS of Assam Agricultural University. 'Kamrupa' the released variety of coconut, most popularly known as "Assam tall" is an encouraging achievement of coconut research in Assam. Apart from releasing the variety, many other agronomic and plant protection practices suited for Assam condition were also standardized. A good number of exotic as well as local accessions of coconut are being maintained at the Research Station for further innovative and farmer friendly research programmes.

Major constraints faced by the coconut farmers

Like the farmers of other parts of the country, the Assam farmers are also facing technical and socio economic problems. A brief note on the constraints is presented below:

1. Management:

Poor quality seedlings, unproductive and senile palms with high density of different crops, lack of integrated pest and disease management practices, poor adoption of improved production technologies and poor or no irrigation facilities are the common problems observed in the farmers' field of this region.

2. Pest problems:

Coconut palms are attacked or infested by a host of insect pests. Incidence of rhinoceros beetle is found to be higher and red palm weevil incidence also is noticed in a few pockets. Termite infestation is the most commonly observed problem in poorly managed coconut nursery. Squirrel attack in nuts is another problem in farmers' field.

3. Disease problems:

Stem bleeding is the major problem faced by the coconut farmers. *Ganoderma* wilt and bud rot are also observed to a lesser extent in the growers' field.

4. Nutritional disorders:

Crown choking in young coconut palms is the major nutritional disorder caused by boron deficiency in the region and in severe conditions it leads to the death of the palm. In adult palms, development of the nut is hampered and nuts are formed without kernel. External cracking on the husk is also noted.

5. Socio-economic problems:

Lack of awareness and poor attitude towards improved production technologies, fragmented and uneconomical land holdings, more input cost, fluctuating and less market price for coconuts, non-availability of skilled labour, lack of processing facilities and very poor marketing facilities are some of the common socio-economic problems of the farmers.

6. Technical problems:

Some of the technical problems faced by the farmers of this region are lack of latest farm information, poor expertise/skill for collection of pest and disease samples, lack of training facilities/technology transfer programmes, etc.

7. Infrastructure problems:

Very poor or no processing facilities for coconut, non-availability of good coconut nursery and lack of skilled labour and irrigation facilities are some of the infrastructure problems faced by the farmers of this region.

Strategies to increase the production and productivity of coconut

There is potentiality for increasing the productivity of coconut in Assam. The following strategies may be adopted for the purpose:

1. Area expansion only in potential locations
 2. Adoption of scientific management practices
 3. Adoption of integrated plant protection measures
 4. Product diversification, by-products utilization and value addition
 5. Farmer friendly technology transfer mechanisms
- Area expansion in potential locations in different districts are to be explored. In south and north bank of the Brahmaputra valley, as well as Barak valley, further expansion of area under coconut plantation can be strengthened. Possibility of extension of area in hill districts also can be explored in a big way for coconut cultivation.

- ICAR Institutes and Agricultural Universities have developed a number of technologies as well as coconut based cropping/farming system models for improving the production and productivity. Among the management practices, the following aspects should be taken care of :

Quality planting material:

Supply of quality planting material plays an important role in the establishment of good plantation which ensures optimum production. In this



direction, Research Stations and DSP farm of Coconut Development Board are playing a vital role in supplying quality planting material to the needy farmers.

Restructuring of homestead gardens: In the homestead gardens, different crops are being grown in an unscientific way. Sufficient spacing is required between crops so as to avoid competition among the crops for natural resources.

Integrated nutrient management: Recommended nutrients should be supplied from the planting stage onwards. Sufficient quantity of organic manures like farmyard manure or vermicompost or composted coir pith or green manure (25-50 kg/plam) are to be applied in the basin of coconut every year. Straight fertilizers in the form of urea (1.5 kg), single super phosphate (2.5 kg) and muriate of potash (1.75 kg) should be applied in two splits during April-May and Sept-October months. Growing green manure crops like cowpea, daincha and sesbania in coconut basin is another low cost technology that can be adopted in coconut garden. For crown choking disorder, application of borax @ 100 g per palm is recommended and it is to be repeated till the recovery of the palm from the symptom. Recycling of the available biomass by converting it into suitable vermicompost with the earth worm *Eudrillus* sp. could result in production of organic manure in the garden itself.

Irrigation techniques: Wherever irrigation facility is possible during non rainy periods, application of water ensures sustainable productivity. Under scarce water resources, adoption of drip irrigation practice ensures higher water use efficiency.

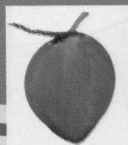
Cropping system / farming system: As the coconut crop does not harness the natural resources to the fullest extent, practice of growing suitable crops in the coconut garden ensures additional income and employment. Crops like banana, black pepper, betelvine, ginger, turmeric, pineapple, citrus, fodder grass, vegetable crops like brinjal, chilli, knol khol and cabbage can be grown successfully. In this region, there is ample scope for cultivating medicinal and aromatic plants as intercrops in coconut garden. Integration with dairy, goat rearing and poultry could play an important role in adding additional income and sustainability of the coconut farming.

Integrated pest management practices: IPM practices have been developed against all major and minor pests like rhinoceros beetle, red palm weevil, root grub, termite and leaf eating caterpillar and these practices are to be popularised among the farmers.

- **Product diversification, by-products utilization and value addition:** There is scope for employment opportunities through product diversification and byproducts utilization. Products such as desiccated

coconut, coconut vinegar, virgin coconut oil, coconut chips, coconut burfy etc. need popularization in this region. This will help in the establishment of small scale industries which would benefit the farmer in a longer way. Production and popularisation of coconut based handicrafts/decorative items can also be promoted.

- Though the evolved technologies have great potentialities, their adoption rate by farmers are very poor. Timely transfer of technologies and field adoption of recommended practices can play a crucial role in improving the production and productivity of coconut. Regarding transfer of technologies, it is suggested that proper and suitable technologies should be transferred through proper media to the farmers' field effectively and at the same time farmers problems should be addressed properly in the research institute for further demand driven research work. Integrated coconut based farming system has to be popularized by the development officials and NGOs through Farmers Participatory Approach, Farmers Field Schools (FFS) and forming Coconut Growers Groups. This will facilitate;
 - a. Farmers' empowerment in decision making.
 - b. Farmers become experts and evaluators of the technology instead of possible acceptors of technology



- c. Farmers' education with science based learning and skill development in farming

To plan a proper transfer of technology mechanism in this region, the following points could be considered.

1. Create awareness and interest through farmers' meetings in the villages. Training programmes, demonstrations and interactive programmes may be arranged as and when required.
2. First line transfer of technology system should be strengthened and farmers' system must be activated.
3. Farmer participatory research approach such as on farm trial, verification trial etc should be initiated and strengthened along with the programmes of the existing research system to generate location specific technologies and to convince the thousands of illiterate farmers about the new improved agricultural technologies.

Conclusion

Although Assam is not a traditional coconut growing state, expansion of coconut cultivation in the state is gradually increasing. The growers are taking interest in growing coconut in homestead gardens and also on a commercial scale. But the commercialization of the coconut cultivation in this region needs the use of quality planting materials and also adoption of scientific management practices recommended to the crop for better yield and return. Need based technology transfer programmes in this region are to be strengthened and implemented.

Wine made of coconut milk exported

Ba Thanh, a coconut farmer in southern Ben Tre province, Vietnam has made wine from coconut milk and exported this new product to several Asian and European countries.

A prescribed dose of this kind of wine will give drinkers silky hair and digestive stability without having headache. The wine can be added to soda or heated.

Ba Thanh succeeded in making the wine from coconut milk in late 2005. His wine plant, located in An Thanh commune, Mo Cay district, turned out 15,000 bottles a month for domestic use and export. The wine has won favour of many customers in the UK, Thailand, Cambodia and Laos.

Ben Tre province has about 40,000 hectares of coconut trees. To expand the plantation and processing of coconut, the Ben Tre People's committee has recently asked relevant agencies to soon carry out a project to grow another 5,0000 ha of coconut, set up a coconut producers and processors association, and build a programme to support enterprises involved in the field. (*Google, 11 September 2006*)

Coco lauric content copied by west

The Philippine Coconut Authority has expressed alarm over reports that western countries were "copying" the lauric acid content of virgin coconut oil.

Deputy Regional Director of PCA Carlos Carpio, said that American scientists were copying the coconut content, perceived to be cure for HIV-AIDS.

Carpio disclosed that oils believed to be containing lauric acid are now available in regular grocery stores and sold at cheaper prices compared to coconut virgin oil. He added that unless the country could produce enough coconut supply, western countries would be forced to look for alternatives to coconut oil and jeopardize the Philippine coconut industry.

The export market of the coconut industry contributes \$750,000 to the country's economy annually, Carpio disclosed. (*Google, 30 August 2006*)

Leachate studies in coconut based cropping system

In the allelopathic studies, the concentrations of allelochemicals, particularly phenols and sugars flowing from the leaf leachates of coconut, clove, banana and nutmeg were analysed. It was observed that the total phenols were higher in the leachate collected from the first copious rainfall of the season (received in May). Among the crops, coconut leachate carried the maximum phenol concentration of 0.73 mg/ml, and banana had the least of 0.07 mg/ml. In the immediate next leachate collection, the phenol concentrations decreased by 70 per cent in coconut, 50 per cent in clove and 25 per cent in nutmeg, whereas that of banana leachate did not change. However, the concentrations of total sugar content increased by more than 60 per cent in all samples.

(*CPCRI Newsletter*)