



Research and Development Support Vital for Promoting Organic Agriculture in Coconut

P.K. Thampan

Introduction

Alternative farming systems are getting acceptance with the coconut farming communities spread over the different States in India. In these States organic agriculture is fascinating many farmers as an economically viable and nature-friendly farming system. While the interest evinced by the farmers in this direction is encouraging, the progress of adoption of the system in coconut farming is thwarted by two major deficiencies. One is inadequate understanding of the concept by many farmers as well as those promoting the system and the other is lack of research and development support for facilitating the adoption of sound on-farm practices.

Concept of Organic Agriculture

The concept of organic agriculture has not been properly understood by many farmers who are trying to practise it. To them the scope of the system is limited to the replacement of inorganic fertilizers and plant protection chemicals with organic sources of nutrients and plant derived pesticides. But organic agriculture does not mean the use of

only organics. It is a system directed towards strengthening the ecological base of farming comprising mainly the soil and water resources. This is facilitated through the adoption of an integrated management approach aimed at minimizing soil and water loss caused by erosion and surface run-off, preventing water logging and salinization, enhancing the natural fertility of the soil and supporting a vibrant soil life. The related measures when adopted under different farming situations are expected to improve soil health and stimulate the underlying productivity of the resource enabling it to support biological production at levels which are profitable and enduring over time. Integration of compatible combinations of tree species and arable crops with or without livestock components in the holdings under coconut, effective recycling of organic wastes, conservation tillage and on-farm water conservation are important components of organic management. In general, the system relies on organic sources of nutrients generated internally rather than on externally derived inputs. Only when on-farm generated inputs fall short

The organic agriculture movement in the coconut sector shall not remain as a fancy or fad of few individuals and groups. It has to spread among the coconut farmers as a viable alternative to chemical intensive production system. The Agricultural Universities and State Agricultural Departments have a major role to play in this direction.

**President, Peekay Tree Crops Development Foundation, Gandhi Nagar, Kochi-682 020
E-mail: pkthampan@yahoo.com, pkthampan@ipath.net.in*



of the overall requirement of an intensive cropping system, external inputs become necessary.

Inadequacy in R&D Support for Organic Coconut Production

Many coconut farmers have started managing their holdings organically. But the production technologies adopted by most of them do not conform to the recognized principles of organic agriculture. This is mainly due to lack of knowledge in appropriate technologies in the absence of adequate research and development support. The areas where deficiency in research and development support is presently experienced are highlighted below:

Coconut-based Cropping System

The growing of miscellaneous tree species of economic importance along with agricultural crops on coconut holdings is regarded beneficial in preventing soil degradation. In the presence of a multi-layered canopy structure offered by the tree species and other crops in the system and a surface cover of plant litter, the extent of soil loss through detachment and transportation in run-off will be comparatively less. In addition to this, the crop combinations are expected to contribute to organic matter build up, improved soil moisture relations and active soil life leading to enhanced biochemical transformations which are conducive to sustainable coconut farming. The tree components are also known to facilitate nutrient cycling and nutrient addition which enable the system to function on a self-sustaining basis thereby

eliminating the need for external inputs.

The farmers who evince interest in organic agriculture have not taken to coconut-based cropping system on a notable scale in most of the States. Except in home gardens tree species are rarely integrated into coconut holdings. This is mainly because of the lack of appropriate technology adaptable under different situations. Although coconut-based cropping system bestows both ecological and economic benefits, the farmers are not responsive to the idea as they apprehend inter-component competition for light, nutrients and water. Research support is presently not adequate to convince the farmers of the benefits of introducing miscellaneous woody species as components of the cropping system. The farmers will go into action only when reliable information become available to them on the compatibility of different tree species and the density of planting to be followed for preventing competition for resources, on the management of trees in the system to result in maximum economic and ecological benefits and on the related technical aspects appropriate to each edaphic and climatic condition. Studies are necessarily to be carried out to evolve suitable coconut-based multi-species cropping models for strengthening the ecological base of farming.

Many tree species are efficient in the biological process of nutrient addition both through nitrogen fixation and deep nutrient capture. While nitrogen fixing capacity is exhibited by some leguminous trees in association with the nodulating

organisms of the genus *Rhizobium* and *Bradyrhizobium* as well as by few non-leguminous trees in association with *Frankia*, research results are not readily available to indicate the efficiency of such trees in nitrogen fixation when grown in gardens receiving regular dressings of manures or fertilizers. When the soil is rich in nutrients especially nitrogen, nitrogen fixation is likely to be hampered as the associated organisms under such conditions may not turn to atmospheric nitrogen. Perhaps, the situation will be the same even in soils which do not receive fertilizer inputs but are enriched through the process of nutrient cycling in the presence of diverse tree species and livestock in the coconut-based agro-ecosystem. But the deep nutrient capture is likely to take place when trees possessing deep roots and greater root volume are available. Research has to focus attention on the soil conditions under which biological nitrogen fixation will be active and on the tree species that are efficient in deep nutrient capture for the benefit of the farmers who opt for organic management of coconut holdings.

In soils which are waterlogged or ill-drained and are saline or saline alkali where coconut is grown on protective bunds, trees and organic amendments are useful in the reclamation process. Not all trees may be useful but some are efficient in lowering water tables and ameliorating soil reaction. Efforts to identify such useful tree species and to introduce them in problem soils are to be made for contributing to ecological security, one of the basic components of



sustainable agriculture. Research support is important in this direction.

Conservation Tillage

Conservation tillage or minimum tillage is an essential component of organic management of coconut holdings. The objectives are to prevent compaction and structural instability of soil, dissipation of native soil organic matter and retardation in soil life. Though tillage requirements are related to soil and climatic conditions, their effects are mainly on weed control which is not favoured in organic agriculture as weeds are considered useful in contributing to organic matter buildup and structural improvement of soil. As such, weeds are not treated as a menace meant for elimination but are only to be suppressed to minimize competition with coconut and other associated crops. Excessive tillage is also not conducive to effective residue management on soil surface. In organic agriculture residue management takes precedence over other cultural operations designed to suppress weed growth, conserve soil moisture and sustain enhanced activities of soil organisms especially earthworms. The fertility status as well as aggregate stability in earthworm worked soils is much better than in soils with a low earthworm population. Research attention has to focus on conservation tillage in relation to soil and climatic conditions and cropping systems so that viable alternatives for soil and water conservation and weed suppression become available to coconut farmers for field adoption.

Soil Fertility Management

The concern for sustainability is the basis for promoting alternative farming systems of which organic agriculture is steadily gaining acceptance among the coconut farmers. However, many of those favouring the transition to organic management of coconut holdings believe that the organic sources of nutrients available in the coconut growing tracts, even if harnessed in full, will not be sufficient to sustain even the present level of production. This group therefore favours integrated plant nutrition system which is considered effective in harmonizing biological production and natural resource base. However, there is a limitation in the concept of integrated plant nutrition system. Here both farmers and scientists compare the usefulness of organics and inorganics in terms of the major nutrients present in each source. In this comparison organic manures are valued only as carriers of major plant nutrients overlooking the presence in them of many growth promoting substances, their residual effect lasting over three or more seasons, positive influence on soil life and aggregate stability and also on soil moisture relations.

The experience of some enterprising farmers who had shifted from chemical based farming to organic coconut production is that by adopting soil and water conservation strategies and efficient on-farm organic recycling along with supplementary use of bioinoculants and other organic inputs like vermicompost, green leaf manure

etc. the productivity of coconut and companion crops in the system could be maintained at levels comparable to that of pre-conversion period. Perhaps, the situation is likely to be different in the case of seasonal or annual crops in which case an inevitable time lag may be involved before the productivity stabilizes at new levels after an initial decline. All these aspects are to be studied in detail by research for evolving viable agronomic strategies to achieve sustainability in coconut production at optimum levels.

Soil and water pollution associated with the intensive use of chemical fertilizers is one of the serious drawbacks of modern agriculture. Nitrate pollution of water bodies, accumulation of cadmium and other heavy metals in soils and plants are often experienced under intensive farming situations. Likewise, the deleterious effects on human and animal health caused by the indiscriminate use of plant protection chemicals are also serious off-shoots of modern agriculture. It is, however, not to be understood that organic manures do not cause pollution problems. In the absence of proper storage of cattle manure, water bodies get polluted through leaching resulting in eutrophication and the attendant consequences. The nutrients present in all organic substrates are to undergo mineralization before becoming available to the plants. When the added organic manures are succulent with a narrow carbon-nitrogen ratio, mineralization will take place at a rapid rate releasing nitrate nitrogen in excess of what could be utilized by the plants. This results in the escape of a portion of



the nutrient in drainage or in surface run-off causing pollution problems as in the case of mineral fertilizer. It is, therefore, important for research to evolve practical methods of on-farm conservation and efficient use of organic sources of nutrients for adoption by the farmers with a view to minimizing nutrient depletion and the likely contamination of ground water and surface water bodies.

Nature-Friendly Plant Protection

Ever since farming became an organized activity, the farmers have been striving to evolve innovative practices for pest and disease control in crops and the knowledge gained has been passed down the generations to become part of the traditional knowledge system. These practices comprised the use of plant derived preparations to suppress pest incidence, the growing of trap or decoy crops to keep the pests away from the main crop, the creation of conditions favourable for the activities of natural enemies of pests and the adoption of appropriate cropping pattern to prevent the insurgence of pests and diseases specific to particular crops. While the farmers had been practising with success the traditional methods evolved over the generations, these were sidelined with the advent of the modern farming systems which resorted to the exclusive use of chemicals for pest and disease control. With the realization of the side effects of plant protection chemicals, there is now a revival of the traditional practices within the limited circle of organic farmers. The concept of integrated pest management is also being promoted

in which the use of chemicals is confined to target specific pests only and that too as the last resort. But this approach is not compatible with the principles of organic agriculture.

Organic farmers engaged in coconut culture believe that multispecies cropping, plant-based insecticides, natural enemies of common pests, decoy crops etc. are the strategic inputs in nature-friendly plant protection. They are confident that when these are appropriately combined and practised effective pest and disease suppression is possible without the use of chemicals. Nevertheless, the effectiveness of this approach under diverse farming situations has to be established before being recommended for general adoption by the coconut farmers. Likewise, detailed information on plant based pesticides and biocontrol agents are also to be generated for the benefit of the farmers.

Community Managed Tree Planting

In coconut farming planting of nitrogen fixing trees as component of the cropping system is not a common practice. Likewise, green leaf manuring has also not been adopted on a wider scale for various reasons including the non-availability of local sources of green leaf manure. Although special attention was devoted to the development of perennial sources of green leaf manure in the past, the interest has waned since the launching of the chemical intensive farming practices in the mid-sixties. One of the more important development supports needed for promoting organic coconut culture

is the launching of a sustained campaign to promote the planting of nitrogen fixing tree species in coconut holdings and also to bring as much open areas as feasible in each village under miscellaneous tree species to serve as dependable local sources of green leaf manure. This could be successfully organized through the village panchayats which will ensure maximum public participation. Organized tree planting campaign to cover the waste lands in each panchayat will have many benefits. Apart from creating local availability of green leaf manure, the trees will help to prevent soil and water loss and serve as a sink for carbon dioxide and atmospheric pollutants, both gases and particulates, thereby improving the quality of local life and contributing to mitigation of and adaptation to climate change. In addition, the local panchayat can generate some funds by levying a fee for collecting green leaf manure from the panchayat lands.

Conclusion

The organic agriculture movement in the coconut sector shall not remain as a fancy or fad of few individuals and groups. It has to spread among the coconut farmers as a viable alternative to chemical intensive production system. The Agricultural Universities and State Agricultural Departments have a major role to play in this direction. Conducting seminars and workshops may be useful. But more important than this strategy is the organization of well planned demonstrations for spreading the concept and educating the farmers on the methods to be adopted under diverse soil and climatic conditions. To begin with,



selected departmental coconut farms in each state could be converted into organically managed units for the local farmers to become convinced of the benefits of the system. Incentives to farmers for switching over to organic coconut production, dependable marketing infrastructure for facilitating the disposal of organically grown produce, technological support to the farmers and effective integration of research

and development are the other major strategic inputs for sustaining an orderly growth of organic coconut production.

In States like Kerala coconut farmers in contiguous belts could be encouraged to bring their holdings under organic management. Such farmers would necessarily need support in getting their holdings certified by approved agencies. Organic certification will provide the

required impetus for the successful marketing of different coconut-based food products, both in the natural and processed forms. Perhaps, a setup under the aegis of Coconut Development Board for promoting the production, processing and marketing of organically grown and certified coconut and its products will prove useful in accelerating the growth of organic movement in the coconut sector.

COCONUT DEVELOPMENT BOARD

(Ministry of Agriculture, Government of India)

Kera Bhavan, Kochi - 682 011, Kerala

Phone: 2377265, 66, 67 Fax: 91-484-2377902

Email: cdbkochi@gmail.com

Indian Coconut Journal (English monthly), Indian Naliker Journal (Malayalam monthly), Bharatiya Nariyal Patrika (Hindi quarterly), Bharatiya Thengu Patrike (Kannada quarterly) and Indhia Thennai Idazh (Tamil quarterly) are the periodicals of the Coconut Development Board. These journals regularly feature popular articles on scientific cultivation and other aspects of coconut industry. The journals are subscribed by farmers, researchers, policy makers, industrialists, traders, libraries, etc.

ADVERTISEMENT TARIFF

(Rate in Rs. per one insertion in one journal)

Position	Indian Coconut Journal (English monthly)	Indian Naliker Journal (Malayalam monthly)	Indhia Thennai Idhazh (Tamil quarterly)	Bharatiya Thengu Patrike (Kannada quarterly)	Bharatiya Nariyal Patrika (Hindi Quarterly)
Full page - B & W	2500	1500	2500	1500	1000
Full page - Colour	5000	4000	5000	4000	2500
Half page - B & W	1500	1000	1500	1000	500
Quarter page - B & W	1000	500	1000	500	300
Back inner cover - B&W	4000	2500	4000	2500	2500
Back inner cover - Colour	6000	4000	6000	4000	4000
Back cover - (Colour)	7500	5000	7500	5000	5000

Special package: A rebate of 10% will be allowed on advertisements inserted in any two editions of the journal at a time and 12% discount if inserted in three or more editions at a time. 15% discount will be given to bonafide advertising agents.