Coconut, as a smallholders' crop, has tremendous potential for resource-poor coconut farmers. However, it is beset by declining farm productivity and farmers' incomes. The Consultative Group on International Agricultural Research (CGIAR) and its Technical Advisory Committee (TAC) recognized that research was one of the ways to effectively alleviate these constraints but also noted that it requires long-term research programmes, with assured organization and funding support, which many national programmes cannot reliably provide without international assistance.

In its review of CGIAR priorities and strategies in 1986, the TAC/CGIAR decided to include coconut in its international research portfolio. At the suggestion of the TAC/CGIAR, at an international workshop on coconut genetic resources in Cipanas, Indonesia in October 1991, representatives of 15 coconut-producing countries recommended the establishment of an international coconut genetic resources network. With the endorsement of the CGIAR and its donors, the International Plant Genetic Resources Institute (IPGRI) established the International Coconut Genetic Resources Network (COGENT) in 1992 to promote an international collaborative programme on coconut genetic resources conservation and use. IPGRI assumes the role of an executing agency for COGENT under its plant genetic resources programme. IPGRI also provides technical backstopping and administrative support, together with funding from its core funds.

COGENT’s objectives include establishing and maintaining an international database on existing and future collections, encouraging the protection and use of existing germplasm collections, identifying and securing additional threatened diversity by developing and adopting suitable technologies and conservation strategies, promoting greater collaboration among research groups in producer countries and advanced technology sources in the exchange of germplasm and the development of new techniques, and conducting appropriate training, information dissemination and securing necessary funding for network activities.

At present, COGENT has 35 member countries which form the five sub-networks: Southeast and East Asia (China, Indonesia, Malaysia, Philippines, Vietnam, Thailand and Myanmar); South Asia (Bangladesh, India, Pakistan and Sri Lanka); South Pacific (Cook Island, Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Tonga and Vanuatu); Africa and Indian Ocean (Benin, Côte d’Ivoire, Ghana, Kenya, Mozambique, Nigeria, Seychelles and Tanzania); and Latin America and the Caribbean (Brazil, Costa Rica, Cuba, Haiti, Guyana, Jamaica, Mexico and Trinidad-Tobago).

COGENT has also established linkages with partner institutions working on coconut. Among these are the Bureau for the Development of Research on Tropical Perennial Oil Crops (BUROTROP), Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), the Asian and Pacific Coconut Community (APCC), Secretariat of the Pacific Community (SPC), Long Ashton Research Station (LARS), Institute for Research through Development (IRD - previously known as ORSTOM) and the Inter-American Institute for Cooperation on Agriculture (IICA).

COGENT’s programme priorities and activities are decided by the Steering Committee which is currently comprised of two regional coordinators from each regional network, with the coordinator and APCC as non-voting members. COGENT’s projects and activities receive funding from various donors such as the Asian Development Bank (ADB), International Fund for Agricultural Development (IFAD), Common Fund for Commodities (CFC) and the Department for International Development (DFID), U.K; the French Government, FAO, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), ACIAR and CTA/BUROTROP.
Note from the Secretariat

The 7th COGENT Steering Committee meeting in Madang, Papua New Guinea, last year, decided that COGENT publish its own newsletter which will serve as a mechanism to inform network members, partner institutions, donors and beneficiaries about the network’s activities. At present, IPGRI/COGENT coordinates 62 country research projects and conducts 8 - 10 activities per year in the five sub-networks. Information on these projects and activities would be useful in promoting more interest in and generate more support for the coconut.

The COGENT Newsletter is a bi-annual publication that will disseminate news from the five regional sub-networks, national programmes, partner institutions and the COGENT Secretariat. It is also envisioned to serve as an effective mechanism for creating public awareness and support for an important crop.

Lastly, we hope that the COGENT Newsletter would serve well as a medium in forging a closer cooperation among member countries, partner institutions, donors and others who share our concern for the resource-poor coconut farmers.

COGENT Coordinator

COGENT Steering Committee

The 7th COGENT Steering Committee meeting made the following decisions:

1. Endorsed the proposal for the Asian and Pacific Coconut Community (APCC) to submit the project proposal for the three International Coconut Genebanks (ICGs) in Asia-Pacific to an appropriate donor.

2. Endorsed the request to hold training courses in 1999 on technical writing and statistical data analysis for country coordinators of both ADB and IFAD-funded projects.

3. Endorsed the proposal to revise and reprint the English version of the STANTECH Manual and translate, and publish it in French, Spanish and Portuguese.

4. Endorsed the proposal to develop a database on coconut research activities among COGENT member countries and partner institutions, and on multi-purpose uses of the coconut and farmers’ varieties.

5. Agreed to publish a bi-annual COGENT Newsletter and to establish a website.

6. Agreed to finalize the Steering Committee’s draft Strategic Plan for 1999-2004.


8. Agreed to hold the 8th Steering Committee annual meeting in September 1999 in Ho Chi Minh City, Vietnam, back-to-back with the annual meetings of the ADB and IFAD-funded projects.

9. Agreed to request BUROTROP to submit the COGENT regional project proposal for the African and Indian Ocean region (which includes the ICG-AIO proposal) to the European Union.

10. Agreed to request the Steering Committee members and the COGENT Coordinator to refine the proposal and explore the possibility of submission of the COGENT regional project proposal for the Latin America and the Caribbean region to the Regional Fund of Agricultural Technology (FONTAGRO).
Tom Osborn  
Chairman  
Mr. Osborn is Agriculture Adviser of the Secretariat of the Pacific Community (SPC) and also Head of SPC’s Crop Improvement Service. He has 25 years of experience in the management of agriculture programmes in Africa, Latin America and the Pacific. His area of interest is in getting appropriate technologies and research results in the hands of farmers through participatory methodologies, especially through improved planting materials and soil fertility. Mr. Osborn feels that COGENT is moving in the right direction with the establishment of coconut germplasm centres and collection, development of appropriate hybrids, analysis of coconut farming systems and examining other strategies that will increase the income of coconut farmers. He also encourages COGENT members to work hard to maintain the confidence of donors that have been

Pierre Yavo N’Cho  
Vice-Chairman  
Dr. N’Cho joined the Marc Delorme Genetic and Breeding Division of the Instituts Des Forêts (IDEFOR) as a coconut breeder in 1986. In September 1998, he was appointed Director, Centre National de Recherche Agronomique (CNRA) of the Marc Delorme Research Station. Dr. N’Cho played an active role in developing the coconut regional project proposal for Africa and the Indian Ocean. He wrote various papers on coconut genetics and breeding. Dr. N’Cho expresses his intention to reinforce the cooperation among the institutions involved in coconut research in his capacity as a representative of the African and Indian Ocean region.

List of the Steering Committee members and their contact details.

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South Asia

Current member countries of the South Asia sub-network are Bangladesh, India, Sri Lanka, and Pakistan.

Kidu in Karnataka, India, was selected as the site for the International Coconut Genebank for South Asia (ICG-SA). A total of 14 self/inter-se accessions had been planted with another 13 accessions ready for planting. The accessions include Indian cultivars and some exotic germplasm.

In Bangladesh, collecting and evaluation of germplasm for tender nuts with IFAD funding was initiated early 1999. Meanwhile, under the regular research programme of the Bangladesh Agricultural Research Institute (BARI), the existing germplasm maintained at the Regional Horticultural Research Centre (BARISAL) have been evaluated. A study on the performance of existing tender nut germplasm was also conducted.

Another activity conducted in Sri Lanka was germplasm characterization of four accessions using DNA and morphological methods. Eleven ecotypes collected in ADB Phase 1 project have been planted.

Under the collecting, multiplication and in situ conservation component, four populations of 40 palms each for non-seasonal Thembili (King) have been identified and 775 seednuts obtained through self-pollination were planted.

S.P Ghosh, Deputy Director General, Indian Council of Agricultural Research, India.

South Pacific

Currently, eight member countries form the South Pacific sub-network, namely: Cook Island, Fiji, Kiribati, Papua New Guinea, Solomon Island, Samoa, Tonga and Vanuatu. The other island nations such as Marshall Island, Tuvalu, Palau and the Federated States of Micronesia are being considered as potential members.

The ADB Phase 2 project activities in the South Pacific sub-network involving all members focus on the collecting, evaluation, characterization and conservation of coconut genetic resources. In Tonga, the Niu ‘Utongau ecotype (with sweet green husk that is popular with children) of Onoiki Island in the Ha’apai group of islands was characterized and the seednuts collected.

The IFAD-funded projects in Tonga, Fiji, Solomon, Vanuatu and Samoa focus on the farmer participatory research on multipurpose uses, identification of farmers’ varieties, evaluation of coconut-based farming systems and promotion of recommended technologies as part of the effort to enhance farmers’ income and coconut germplasm conservation.

There are several issues affecting the progress of the projects. Among them are limited number of technical staff; lack of training activities; national, regional and international priorities that may vary; and constraints in regards to time, funding and communication. Follow-up training, attachment with other institutions and degree-level training are needed.

Malcolm Seumannuta Hazelman, Chairman (COGENT) 1997-1998, former Agriculture Manager, South Pacific Commission (SPC), Fiji.

Southeast and East Asia

Malaysia, Thailand, Vietnam, China, Myanmar and the Philippines are the current members of COGENT’s Southeast and East Asia sub-network.

Under the ADB-funded project, activities conducted included the collecting, evaluation and conservation of coconut germplasm carried out together with the application of standard protocols on coconut genomic DNA isolation, embryo culture and microsatellite (SSR) molecular markers.

The IFAD-funded project supports research projects on the evaluation of coconut varieties and hybrids for sap yield and sugar production in Indonesia, intercropping coconut in Malaysia and in the Philippines, and the screening of varieties for sugar production and improvement of quality of granulated sugar in Thailand. The DFID-funded projects on refinement of protocols for embryo culture, monitored by Erlinda Rillo, the Embryo Culture Project Network Coordinator under the PCA, were reported to be progressing well.

The ‘Workshop on Lethal Diseases of Coconut caused by Phytoplasmas and their Importance in Southeast Asia’ was held in Manado, Indonesia on 16 – 17 February 1998. The meeting discussed the impact of these diseases on rural communities in Indonesia. The workshop also formulated strategies for rehabilitation of the affected areas. There was a general consensus that phytoplasma-caused diseases are the most important single threat to global coconut production. Farmer participatory research on coconut diversity training workshop was also conducted in Davao, Philippines in March 1998.

Carlos Carpio, Deputy Administrator, Agricultural Research & Development Branch, Philippine Coconut Authority (PCA), Philippines.
Latin America and the Caribbean

Member countries are Brazil, Mexico, Jamaica, Costa Rica, Cuba, Guyana, Haiti, and Trinidad-Tobago.

Brazil, Mexico and Jamaica are producing the local hybrids according to schedule, for the CFC-funded multi-location trial project. In September, the embryo culture work to verify the four established protocols conducted by CPATC/EMBRAPA in Brazil was initiated in accordance with the proposal submitted to COGENT. Brazil presented the proposal to host the International Coconut Genebank for LAC at the 7th COGENT Steering Committee meeting in Papua New Guinea.

In Mexico, activities conducted included the 1st National Coconut Conference held in January 1998, together with the STANTECH Training Course. Mexico also obtained pollen from Côte d’Ivoire. Jamaica played host to coconut researchers from Honduras and the Bahamas where a familiarization activity on coconut hybridization techniques was conducted.

The spread of the lethal yellowing disease continues. In the Caribbean, the disease is reported to be active in Hispaniola, Turks, Caicos Is., and the Bahamas. And on the mainland, it is rampant in Mexico, Belize and Honduras. In Mexico, the disease had appeared for the first time in the Pacific Coast coconut-growing region. In Haiti and Jamaica, there are certain areas where the incidence of the lethal yellowing disease was much higher than previously observed among populations of Malayan Dwarfs and their hybrids. Breeding for resistance continues in Jamaica and Mexico. Hybrid seed gardens are operating in Belize and are being established in Honduras.

Basil Been, Director of Research, Coconut Industry Board, Jamaica.
Indonesia

By Amrizal Idroes and David Allorerung*

Coconut is a strategic commodity in Indonesia in terms of its economic role and its value as a socio-cultural crop. Nevertheless, the industry faces two main problems: low farm productivity and unstable market price leading to low income generated from coconut farms.

Aside from the unstable world market price of coconut oil, the low returns from the coconut is also due to the fact that it is mostly cultivated as a monoculture crop with copra as the predominant commodity. Other potential by-products such as coconut husk, shell, water, and wood are, in general, left behind as waste in the farm. To some extent, such materials are converted into products of economic value in some coconut producing regions such as Lampung, Riau, and North Sulawesi provinces where processing industries are available. Intercropping is an alternative practice and in certain areas, it is practised with low technology inputs.

The Government of Indonesia (GOI), since the early 1970’s, has made several efforts to develop the coconut industry. In general, the objectives are to improve the small farmers’ welfare, and to increase the supply of copra in the domestic market. Four main programmes are being carried in order to achieve the objectives, namely, extensification, intensification, rejuvenation and rehabilitation.

Extensification is mainly focused on opening new areas for coconut planting using local selected Tall and the hybrid, PB 121. The Government of Indonesia, with financial assistance from the World Bank initiated several ‘Smallholder Coconut Development Projects’ (SCDP) in the late 1970’s to increase coconut production and farmers’ income by utilizing early bearing and high-yielding hybrids. The intensification, rejuvenation and rehabilitation programmes were conducted using GOI’s own budget. The intensification programme provided farmers with modern inputs such as inorganic fertilizers to increase their coconut production. In line with this programme, a low-interest credit scheme was provided to farmers. The rejuvenation and rehabilitation programmes focused on activities to rejuvenate and rehabilitate coconut palm areas by introducing or replacing palms with selected local tall varieties or hybrids as planting material.

The Research Institute for Coconut and Palmace (RICP) implements the research programme for coconut in Indonesia. It is a national research institute under the Agency for Forestry and Estate Crops Research and Development (AFECRD).

RICP is structured to accomplish its mandate through five main coconut research programmes, namely, the improvement of potential coconut genetic resources, development of product diversification and strengthening farmer institutions, marketing and commodity analysis, pest and disease control, and improvement of land utilization efficiency under coconut.

The objective of coconut genetic improvement is to diversify selected coconut types to meet users’ requirements. The main target of product diversification research programme is to develop appropriate small-scale coconut processing for rural sites to be supported by strong farmer organizations which will run the processing units.

The crop protection research programme is focused on studying the effectiveness of bio-insecticide to control Sexava nubilla, and to study the etiology and epidemiology of budrot and nutfall diseases caused by phytophthora, and coconut wilt disease caused by phytoplasma. The intensification research programme is geared towards developing the technology package for efficient land utilization under coconut through modifying the existing farm technologies such as planting systems, and efficient intercropping.

In the last five years, several technologies have been developed as a result of the research. These include technology on coconut rejuvenation system, intercropping under coconut, and efficient fertilizer application. Within the next five years, RICP will launch four new hybrids and release an appropriate technology on integrated coconut processing for the rural areas.

*Director and Economist/Head of Research Planning, respectively, Research Institute for Coconut and Palmace, Indonesia.
Sri Lanka

By Ursla Fernando, J M D T Everard, Lalith Perera, C K Bandaranayake and Chandrika Perera.

Coconut is the most widely grown plantation crop in Sri Lanka, occupying about 442,400 ha of land out of a total area of about 6.5 million ha. Coconut provides approximately 25% of the calorific requirement of the average Sri Lankan diet and the annual per capita consumption stands at 120 nuts. Around 80% of an estimated total production of 2,600 million nuts/year is consumed domestically while exports of copra and oil is about 20% of the product.

The available coconut germplasm in Sri Lanka is categorized into three distinct varieties as typica, nana and aurantiaca. The typica or the tall type is the most widely exploited variety and makes up 98% of the coconut planting.

Systematic collecting and conservation of coconut germplasm was initiated in Sri Lanka only after 1984. It has two objectives, namely, conserving the existing biodiversity carried out through random and biased sampling of specific populations, and collecting and conservation of germplasm showing drought tolerance, through biased sampling.

Drought tolerance became a priority in coconut breeding in the mid 1980’s. It was observed that within the drought-prone areas, certain populations and even individual palms maintained their productivity despite the severe water deficit. Such naturally adapted palms and/or populations were identified and representative samples were collected as part of the germplasm conservation activity. To date, 23 such ecotypes have been identified and conserved.

Collecting activities were focused on locating and purifying exotic material that has built up through introduction and has become naturalized under different agro-ecological conditions in Sri Lanka.

In addition to the above activities, systematic collecting was conducted to conserve representative germplasm. Two hundred nuts were collected from each accession/population of 100 palms and 100 seednuts were sown for conservation while the remaining was used for fruit component studies.

A total of 57 tall accessions and six dwarf accessions have been conserved in four ex-situ genebanks during the period of 1989-1998. Most of the conserved germplasm consist of at least 75 palms/accessions. Meanwhile, several populations with high yield potential have been identified and conserved in-situ. At present, 15 of these populations serve as seed sources for the national replanting programme, supplementing the seednuts sourced from improved cultivars.

A systematic germplasm evaluation trial was initiated in 1994 using seven selected germplasm accessions, namely, Clavis, Maliboda, Moorock, Debarayaya, Margaret, Ambakelle special, and Ambakelle tall which were already in ex-situ genebanks. They were identified to be diverse based on multivariate analyses of quantitative characters.

Four distinct germplasm accessions, Moorock, Debarayaya, Kasagala and St. Annes which showed stable yielding ability despite environmental fluctuations, were crossed to a selected pool of proven high and stable yielders at Ambakelle.

Embryo culture technique was developed in coconut to be used as an in-vitro technique for collecting germplasm from distant locations and for use as an embryo rescue method for propagating the ‘Dikiri pol’, a ‘makapuno’ type indigenous tall coconut which would not germinate. Two methods have been developed: the direct in-vitro explanting in the field for aseptic explanting and culturing, and the slow growth method where embryos are dissected and cultured in a special agar-based medium which suppresses further growth and development of embryos without effecting their viability.

To complement morphological characterization of conserved germplasm, biochemical and molecular characterization are also in progress. The isozyme characterization methodology has been established using immature leaf but the polymorphism expressed by different enzyme systems has been limited except for esterase and peroxidase. Using a combination of molecular markers, detection of the level of diversity of the conserved coconut germplasm of Sri Lanka is now being conducted.

Other activities initiated in Sri Lanka included the collecting and conservation of 26 accessions in two ex-situ genebanks, a study of the conserved germplasm using a combination of molecular, physiological and in-vitro parameters (ADB project Phase I and II, respectively), a study on the improvement of the indigenous King coconut germplasm to be used as a natural beverage, and development of technology for enhancing the shelf life of King tender nuts for export.

*Research team (breeding and genetic improvement of coconut), Genetics and Plant Breeding Division, Coconut Research Institute, Sri Lanka.

Spotted on the Internet

“He who plants a coconut tree plants food and drink, vessels and clothing, a home for himself and a heritage for his children”

- South Seas saying

www.soupsong.com
Papua New Guinea

By Tore Ovasuru*

The executing agency of Papua New Guinea's national coconut research programme is the Cocoa and Coconut Research Institute (CCRI). The programme is made up of a number of components designed to address the major problems faced by the coconut industry.

CCRI has implemented a countrywide survey in which local germplasm were identified, collected and established in a field genebank, located at the Stewart Research Station near Madang. Underlying this work was the principle that local germplasm may have tolerance to the insect pests affecting the coconut palm because of natural selection pressure. The current germplasm collections are made up of a number of trials located in Madang and East New Britain. The programme also includes the preservation of economically important germplasm from the South Pacific region, in the International Coconut Genebank for the South Pacific (ICG-SP).

Screening for tolerance to insect pests was also initiated, in view of the severity of this problem especially in the New Guinea islands region of the country. Several populations among the Gazelle Tall variety were used for this purpose. The objective was to study the genetic potential of local Tall ecotypes for insect tolerance. Breeding coconut varieties with adequate tolerance to major insect pests, i.e. rhinoceros beetles and black palm weevil, is undoubtedly the best long-term solution to the problem. Research is also being carried out to find effective control methods. Among these, the development of a pheromone trap for the black palm weevil, Rhynchophorus bilineatus. Traps are being developed and tested to lure Oryctes beetles and black palm weevils using commercially available pheromones, and Scapanes beetles (females) using a live male insect in sugar cane cube.

The coconut agronomy programme includes a factorial fertilizer trial on hybrids and nutrition survey work, both at Stewart Research Station. The fertilizer trial aims to establish the best application rates. An ongoing trial compares different methods of replanting Tall coconuts with hybrids such as felling and replanting, poisoning and leaving the dead palms standing, and planting the hybrids under the Talls, which are killed later.

In 1997, CCRI established a research programme to apply a farming system approach to investigating promising intercrop combinations with coconut.

*Section Head, Coconut Breeding, PNG Cocoa & Coconut Research Institute, Papua New Guinea.

Brazil

By Evandro Almeida Tupinambá1, Wilson Menezes Aragão2 and Ederlon Ribeiro de Oliveira3

The national coconut research programme in Brazil is conducted by the Brazilian Agricultural Research Corporation (EMBRAPA) through its Coastal Tablelands Agricultural Research Center – CPATC – located in Aracaju, Sergipe, Northeast Brazil. Research is carried out in the areas of biotechnology, entomology, plant pathology, microbiology, plant breeding, agronomy, biometrics, agricultural economics and sociology. Embrapa also maintains the Coconut Germplasm Active Bank at CPATC. In this germplasm bank, the molecular characterization of all the accessions is being conducted by the Universidade de Estadual do Norte Fluminense – UENF, Rio de Janeiro, a partner in a technical cooperation programme.

Brazil has submitted a proposal for the establishment of an International Coconut Genebank for Latin America and the Caribbean during the 7th COGENT Annual Meeting. Brazil is also one of the participants in the multi-location hybrid/variety trials and technology transfer project, together with other five Latin American/Caribbean and African countries. Evaluation of six common hybrids and four local hybrids will be conducted in each of those countries.

Studies dealing with agroeconomic survey to characterize coconut producers in five states of Northeastern Brazil are currently being carried out. The objectives are to characterize the coconut productive system, potential trading markets for the coconut water and economic evaluation of the impacts of new recommended technologies.

Embrapa is currently selecting progenies of dwarf and tall coconuts in order to develop and evaluate hybrids in 17 states covering all geographic regions of Brazil. The breeding...
programme aims to select coconut cultivars with precocity, high fruit production, better quality of solid and liquid albumen, mite and leaf diseases resistance, drought tolerance and adaptation to different Brazilian ecosystems. Brazil also participates in the COGENT / coconut embryo culture project network, together with 12 countries. The project objective is to validate protocols for “in vitro” culture. Research using molecular markers will be intensified.

Studies dealing with the chemical control of helminthosporiosis, “dry-bud rot” disease vector and etiology; and biological control of “lixas” with hyper parasite fungi are underway. Integrated control of major coconut pests, with emphasis on biological control, using pheromone, chemical and other alternative control measures in partnership with the Federal University of Alagoas, Agrarian Science University of Para, Embrapa – Humid Tropics (CPATU), Embrapa – Semiarid Tropics (CPATSA) and Bahia State Company for Agricultural Development (EBDA), are also being carried out.

Physiological studies are underway to evaluate the soil/plant water relationships and coconut ecophysiology. Localized irrigation systems and water depth experiments in green dwarf coconut are in progress.

Research on agroforestry systems (coconut + perennial fruit crops), with corn and jack beans in irrigated coconut and with annual food crops in rainfed dwarf coconut plantations, are being undertaken by Embrapa researchers.

1 Genetic resources specialist, 2 Coconut breeder, and 3 Research and Development Associate Chief - Embrapa/CPATC, Brazil.

Côte d’Ivoire

By Y.P. N’Cho and J.L. Konan*

Coconut plays a major role in the economy of Côte d’Ivoire. Côte d’Ivoire ranks first in Africa for the export of coconut oil, desiccated coconut, and other coconut products.

In 1967, the Government of Côte d’Ivoire initiated a national programme conducted by the Government Estate Sodepalm. Between 1967 and 1980, Sodepalm established 30,000 ha of coconut plantations in five major areas of the country; Port-Bouët, Assinie, Fresco, Grand-Lahou and Gliké. The coconut programme developed by Sodepalm contributed tremendously in reducing poverty in the rural areas of the coastal region of Côte d’Ivoire.

Two major events have boosted the coconut sector in Côte d’Ivoire; the 1994 devaluation of the CFA currency and the privatization of Palmindustrie, the estate that took over Sodepalm. The devaluation has rendered the Ivoirian coconut oil very competitive in the regional and world markets while the privatization of Palmindustrie allowed the emergence of other important companies in the coconut sector.

Coconut industry in Côte d’Ivoire could receive a boost from the expanding regional market. Oil deficit in Nigeria and Ghana, the presence of desiccated coconut factories and copra mills in Ghana which depends partially on the production of Côte d’Ivoire, and the decimation of coconut grove in Ghana by the lethal yellowing disease are some of the contributing factors.

Although the coconut development programme has been privatized, the government has given some recommendations in the long-term national agriculture master plan for a strong valorization and diversification of coconut products. Replanting programmes are highly recommended in order to sustain an adequate supply of raw materials for the factories.

The Marc Delorme Research Station (formerly IDEFOR) of the new National Centre for Agronomic Research (CNRA), played a key role in the first 1967-80 national coconut programme, conducting activities such as soil surveys for establishing the plantations, and providing planting material and technical assistance for Sodepalm. This strong linkage between the Development Estates and the station has allowed the scientists of the Marc Delorme Station to monitor the performance of the planting materials released to the industrial plantations.

The current research priorities for the CNRA are focused on four research areas, namely; coconut germplasm conservation and evaluation, breeding for disease tolerance and other environmental stresses, breeding for specific technological traits and breeding for yield. With these objectives, related activities were initiated. The Marc Delorme Research Station was involved in a network on the lethal yellowing disease. Specific traits, for the development of more suitable varieties for the various needs of the industry, are also being screened within accessions and hybrids.

The coconut industry in Côte d’Ivoire flourishes due to the strong relationship of the CNRA/Marc Delorme Research Station with the other development programmes and the processing industries of the coconut sector. The new economic situation of this sector has also enhanced private coconut development programmes. The International Coconut Genebank for Africa and Indian Ocean, located at the Marc Delorme Research Station offers a good opportunity for creating hybrids and varieties that can be utilized for both national and regional development programmes. Furthermore, the incorporation of new specific traits in the breeding programmes will allow a better valorization of the coconut in Côte d’Ivoire in particular and in West Africa in general.

*Director and Breeder, respectively, Station de Recherche Marc Delorme, Centre National De Recherche Agronomique (CNRA), Côte d’Ivoire.
Young, tender coconut: research to improve its potential

Coconut is often associated with the exotic, far-flung Pacific islands where the sweet juice of the young, tender coconut quenches the thirst of the sunburned tourists. Similar scenes had also been immortalized in classic writings such as ‘Robinson Crusoe’ and the ‘Lord of the Flies’, where the readers are told of the characters’ dependence on the nuts as their source of nutrition. They can also be found in the streets of other coconut-growing countries like India and the Philippines, providing cooling refreshment to the locals.

A nut is young and tender when it is six to nine months old from the fertilization of the female flower of the palm. The juice is sweet but not all of the young, tender coconut would have the same sugar content. The condition in which the coconuts are grown, the kind of minerals in the soil, the varieties and the age of the coconut would affect the taste and quality of the water in the nuts. The soft, nutritious kernel in the nuts complements the sweet liquid to make it a wholesome drink. It also brings good news to the health-conscious people as it contains carbohydrates, nutrients such as calcium and iron, and has low fat content.

Young, tender coconut water is normally consumed in its natural state, with one end of the nut sliced and the water drunk immediately. It does however, comes in other forms. ‘Egg coconut’, for example, is a type of product consisting of the whole kernel pulled out from the shell with the liquid still intact in it. A feedback from a commercial processor of ‘egg coconut’ in Malaysia, indicates that Malayan Yellow Dwarf is preferable because the husk and shell is soft and easy to manage. Its smaller size is also more appealing to the general consumer.

In his paper, ‘Technologies on environment-friendly young, tender coconuts’, Dr Syed Kamaruddin Syed Wazir, a senior analyst with MIGHT (Malaysian Industry-Government Group for High Technology), lamented the fact that the planting of dwarf coconuts for the production of young, tender nuts has not been extensively established in many coconut growing countries although the industry has shown to be profitable in countries like Malaysia and Thailand. He went on to say that the planting of selected varieties such as the Malayan Yellow Dwarf, Chowghat Orange Dwarf (India), King Coconuts (Sri Lanka) or Nam Hon (Thailand) in specific localities, would not only be in harmony with the environment, but would also beautify the landscape and gives growers higher returns from the nuts.

Four countries, namely: Sri Lanka, Bangladesh, India and Fiji, are currently undertaking research on young, tender nuts under the IFAD-funded project. The projects focus on identifying suitable varieties for young, tender coconuts and developing viable technologies and marketing systems involving women. Information and feedback from coconut farmers are acquired through the farmer participatory surveys (FFR). In India, suitable varieties for young, tender coconuts were identified while in Fiji, characteristics of 9 – 12 farmers’ varieties based on information gathered through five selected villages were documented.

Several activities were conducted to enhance the profitability and marketability of young, tender coconuts. In India, three stalls, operated by women, were organized to assess the economic benefits. The development of an appropriate technology for the profitable utilization of the mesocarp and endocarp of tender nut was initiated in CPCRI. Sri Lanka is developing a non-seasonal variety with characteristics suitable for tender nuts. Four populations were identified, the palms self-pollinated and 710 of the progenies sown in the nursery. Sri Lanka also studied the suitable age of harvest and the conditions needed to prolong shelflife of tender nuts. The suitable age was identified at seven months with cling film as the best wrapping material and 14 – 16°C as the best storage/shipping temperature. The study identified low productivity as one of the reasons for the farmers’ failure to meet the market demand.

In some parts of Malaysia, the water of young, tender coconut is also consumed in a different way. Tender nuts are burnt for an hour or so until three quarter of the husk turns black and drunk when it is lukewarm or cooled. They are appropriately called ‘burnt tender nuts’. It said to be good for curing asthma, food poisoning and reducing high blood pressure.

Malayan Yellow Dwarf is the preferred young, tender coconut in Malaysia. Picture courtesy of Au Wai Fong (Ulu Dusun Agricultural Research Station, Sabah, Malaysia).

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Research on young tender coconut is progressing well in COGENT member countries. It is hoped that this research project will not only lead to better-tasting nuts but more important, it will enhance the incomes of resource-poor farmers and benefit more women.
The Bureau for the Development of Research on Tropical Perennial Oil Crops (BUROTROP), is a non-profit-making association, registered in France in January 1995. Its mandate is to assist, strengthen and further develop research on tropical perennial oil crops. BUROTROP has 94 active members and 1250 associated members.

The contributions by BUROTROP, with the help of CTA, made possible the participation of 33 scientists in eight important meetings. It enabled researchers, often isolated in small national structures, the opportunity to interact with their colleagues from other countries and contribute to and benefit from each other’s programmes within the BUROTROP network. These include the two APCC COCOTECH meetings in Manila, Philippines (July 1997) and in Bali, Indonesia (July 1998), the Multilocation Variety/Hybrid Trials Workshop and COGENT Steering Committee Meeting, held back-to-back with BUROTROP’s Programme Committee in Abidjan (November 1997) and the International Symposium on Coconut Biotechnology at CICY, Mexico (December 1997).

BUROTROP also contributes to the direct funding of selected research and training projects. The Coconut Processing Technology Skills Development Training for the SPC, in Davao City, Philippines (April 1997) is one such project. A Manual of Procedures was produced which provides the details of 17 coconut processing technologies in simple terms for would-be entrepreneurs. Another project is the ongoing APCC project on the assessment of the performance of high yielding coconut varieties/hybrids and the varietal preference of coconut farmers. This study is being conducted through a survey by national consultants in 18 countries. The long-term project objective is to provide policy directions to increase coconut productivity and contribute to the sustainable development and global competitiveness of the coconut industry. The third project was on coconut molecular markers, with Long Ashton Research Station (LARS), UK, and CIRAD, France, using material supplied by the Philippines and Côte d’Ivoire. The project compared SST and RFLP markers on the same material for diversity studies and tried to establish a preliminary linkage map of a hybrid population. The results are now being interpreted.

Attending scientific and technical meetings provides opportunities for BUROTROP to exchange information and ideas with the participants and to generate new initiatives. One such meeting was the Regional Coconut Project Formulation Meeting in Kingston, Jamaica, from 7 to 10 July 1997 for the establishment of the LAC regional coconut network. This was co-funded by COGENT and IICA.

BUROTROP’s participation in policy meetings enables it to speak for its members and clients, and to influence decisions taken. One such meeting was the European Colloquium on Agricultural Research for Development in Montpellier (September 1997), where BUROTROP was cited as an effective example of a North-South network involving all kinds of members of the industry as well as partners from European research organizations.

Other activities included the publication and dissemination of BUROTROP’s Bulletin No. 12 and the General Overview of Oil Palm in Africa, prepared in collaboration with AFOPDA. BUROTROP Web site has also been established and can be viewed at http://www.burotrop.org.

The year also saw the relocation of BUROTROP’s headquarters from Paris to Montpellier and the selection by the Board of a new Director, seconded from CIRAD as a contribution from the French Government to BUROTROP.

BUROTROP considers that the interventions made during the year under review, and during earlier years, have resulted in increased research activities in both oil palm and coconut. Events organized by its partners have also been enhanced through its support in funding the participation of key persons. Any deficiencies in the content and balance of its programme will be corrected in the coming year to the extent made possible by donors and partners.

*Directeur Burotrop, Agropolis International, Montpellier, France.
Asian and Pacific Coconut Community (APCC)

By PG Punchihewa*

The Asian and Pacific Coconut Community was established in 1969 and was the first intergovernmental organization to be set up on a single commodity basis in the region. At present, APCC has 13 member countries, namely: Federated States of Micronesia, Fiji, India, Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, Samoa, Sri Lanka, Thailand, Vanuatu and Vietnam.

The Secretariat of the Community is located in Jakarta, Indonesia. It coordinates activities with the member states through a network of national liaison officers drawn from government agencies that are involved with the coconut industry in the respective countries.

The objectives of the Community are to promote, coordinate and harmonize all activities of the coconut industry. To achieve these objectives, the Articles of Agreement provided for 15 functions covering different aspects of the industry. The plenipotentiary delegates of the member countries meet at least once a year to draw up plans and discuss policy matters affecting the industry, at national, regional and international levels, guidelines and programme of activities for the following year. The meeting also reviews the previous year’s programme both at national and regional level.

APCC realizes the important role information plays in the development of the industry. For this purpose the Secretariat of the APCC functions as the regional center in a network for collection, analysis, packaging and dissemination of coconut information. Information is disseminated in various forms such as journals (CORD, COCOMUNITY, COCINFO International), proceedings of meetings, country studies, technological sheets, directories, statistical year books and video documentaries.

APCC, from its inception, has promoted programmes for product and market diversification. Studies had been conducted to identify constraints and potential for expansion of markets for coconut products. APCC was also instrumental in bringing together exporters of coconut products on a common platform in order to have close link among themselves and also with importers.

APCC realizes the need to maintain high quality standards if the coconut products are to retain and expand their markets. Accordingly, in 1995, APCC with the inputs provided by an expert group of food scientists drew up a set of uniform quality standards for aqueous coconut products which should serve as a basis for the countries to follow. APCC also frequently arranges training programmes to suit the varying needs of the countries as a technology transfer exercise.

Then Secretary General of the United Nations, Mr. Boutros Boutros Ghali in his message to the APCC on the occasion of its silver jubilee celebrations in 1994, stated:

“I do believe that organizations like the Asian and Pacific Coconut Community has an extremely important role to play. Despite the commendable initiatives that member countries have taken over the years, individually or collectively through the Community, a great deal remains to be done. I am, therefore, convinced that strengthened regional cooperation among coconut producing countries remain the key to meeting the challenges that the coconut industry will have to face in the coming years”.

The plenipotentiary delegates to the XXXI APCC Session held in October 1994 in Colombo concurred with the views expressed by the Secretary General in declaring their commitment and political will to accord appropriate priority to the development of the coconut industry at national level and to further strengthened intra- and inter-regional cooperation in the area of production, processing, marketing, research, information and policy.

*Executive Director, Asian Pacific Coconut Community (APCC), Indonesia.

COGENT Databases

The International Coconut Genetic Resources Network (COGENT) is developing three databases: the Coconut Genetic Resources Database (CGRD), farmers’ varieties and multipurpose uses of the coconut, and research information.

Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), in Montpellier, France, implements the CGRD project in collaboration with COGENT member countries. The CGRD stores passport and characterization data of coconut accessions from the member countries.

Farmer Participatory Research (FPR) is a major component of the IFAD project being conducted by the participating COGENT member countries. In these surveys, the farmers will identify and describe coconut varieties being grown and their multi-purpose uses using their own terminologies. The data and information obtained will be developed into a database and shared with member countries. COGENT will also establish a coconut research information base where it will identify, source, document and disseminate information of completed activities from member countries, partner institutions and donors.

The databases are set-up in IPGRI-APO regional office in Serdang, Malaysia.
Coconut Genetic Resources Network and Human Resources Strengthening in Asia and the Pacific (Phase II)

The project, funded by the Asian Development Bank (ADB) involves 20 countries; China, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Bangladesh, India, Pakistan, Sri Lanka, Fiji, Samoa, Papua New Guinea, Solomon Islands, Tonga, Vanuatu, Cook Islands, Kiribati, Tuvalu and Marshall Islands. The two objectives of the project are, firstly, to develop sound environmental management of coconut genetic resources in Asia and the Pacific through sustainable conservation and utilization of the coconut, and secondly, to organize high quality training courses on plant genetic resources to strengthen human resources needs for sustainable conservation and utilization of the coconut. These objectives support the governments’ goals to increase coconut productivity, reduce poverty and conserve plant genetic diversity.

Sustainable Use of Coconut Genetic Resources to Enhance Incomes and Nutrition of Coconut Smallholders in the Asia-Pacific Region

The project is funded by the International Fund for Agricultural Development (IFAD) and involves 14 countries: China, Vietnam, Thailand, Malaysia, Indonesia, Philippines, Bangladesh, India, Sri Lanka, Fiji, Samoa, Solomon Islands, Tonga and Vanuatu. The project’s objectives are: enhancing national agricultural research system (NARS) capacity in participatory technology development in coconut conservation and utilization, and improving income-generating potential of coconut production systems. Overall, the project’s strategy is to promote genetic resources conservation and use through the increase in yield of cultivars, smallholders’ income through high value products, and productivity per unit area.

Coconut Germplasm Utilization and Conservation to Promote Sustainable Coconut Production

The project is funded by the Common Fund for Commodities (CFC). Six countries are participating in the multilocation hybrid/varietal trials project, namely: Côte d’Ivoire, Benin, Tanzania, Jamaica, Mexico and Brazil. The 5-year project aims to address the problem of low productivity of the coconut. The objectives of the project are to assist national programmes in conducting multi-location trials to identify suitable varieties/hybrids for yield improvement and enhanced adaptation in six coconut-growing African and Latin American/Caribbean countries (Benin, Côte d’Ivoire, Tanzania, Brazil, Jamaica and Mexico), and to evaluate germplasm x environment interaction, which will serve as a guide to the application of results to other countries with similar cultivation conditions.

Improvement of In Vitro Techniques for Collecting and Exchange of Coconut (Cocos nucifera L.) Germplasm

The project is funded by the Department for International Development (DFID), U.K.

Thirteen embryo culture laboratories are refining embryo culture and acclimatization technology using local and major regional varieties under local laboratory conditions, and developing a protocol for medium-term conservation. The participating research laboratories are: Institute for Research through Development (ORSTOM), France; Centro de Investigacion Cientifica de Yucatan, Mexico; Central Plantation Crops Research Institute, India; Coconut Research Institute, Sri Lanka; Research Institute for Coconut and Palmae, Indonesia; Albay Research Center, PCA, Philippines; Department of Agriculture, University of Philippines Los Banos, (UPLB), Philippines; Institute of Plant Breeding, UPLB, Philippines; Centro de Pesquisa Agropecuaria dos Tabuleiros Costeiros, EMBRAPA, Brazil; Stewart Research Center, CCRI, Papua New Guinea; Agricultural Research Institute at Mikocheni, Tanzania; Instituto de Investigaciones de Citricos y Frutales, Cuba and Wenchang Coconut Research Institute of the Chinese Academy of Tropical Agricultural Sciences (CATAS), China. The project also supports training of coconut researchers, workshops, meetings and publications worldwide.

Six-month old embryo cultured Rennel Tall using the PCA protocol at the Research Institute for Coconut and Palmae (RICP), Indonesia. Picture courtesy of Nurhaini Mashud (RICP).
Publications

Manual on Standardized Research Techniques in Coconut Breeding (STANTECH)

The STANTECH Manual enables coconut breeders and germplasm researchers worldwide to use standardized techniques in breeding and germplasm conservation. It is hoped that the manual would assist coconut researchers in obtaining better and comparable research results to accelerate the development of improved varieties for millions of coconut farmers.

Coconut Breeding - Proceedings of Workshop on Standardization of Coconut Breeding Research Techniques
Port Bouet, Cote d’Ivoire
20 – 25 June 1994

The proceedings present the coconut breeding programmes in 16 countries: India, Sri Lanka, Indonesia, Philippines, Thailand, Vietnam, Papua New Guinea, Fiji, Vanuatu, Benin, Côte d’Ivoire, Ghana, Nigeria, Tanzania, Mexico and Jamaica.

Proceedings of the COGENT Regional Coconut Genebank Planning Workshop
Pekanbaru, Riau
Indonesia
26 – 28 February 1996

This publication provides a comprehensive overview of COGENT’s plans for the establishment of a multi-site International Coconut Genebank.

Coconut Embryo In Vitro Culture Proceedings of the First Workshop on Embryo Culture
Banao, Guinobatan, Albay, Philippines
27 – 31 October 1997

For every embryo lost, there is a possibility that an important diversity may be lost. In order to address this concern, the workshop was organized to assess the status of the coconut embryo culture and acclimatization technologies, and to upgrade and standardize the protocols so that more coconut researchers could use it with better efficiencies. The proceedings contain papers on status of embryo culture research in 10 laboratories, the research gaps identified and the research projects designed to address these research gaps.

Viroid-like Sequences of Coconut Proceedings of a Meeting
Kajang, Malaysia
21 – 23 April 1997

Recognizing the need to resolve the issue of viroid-like sequences in coconut, ACIAR, IPGRI and COGENT organized a workshop in which participants from laboratories in Australia, France, Italy and the Philippines presented summaries of their research and discussed the quarantine relevance of the viroid-like sequences in coconuts. The results of the workshop led to the formulation of the Addendum to the FAO/IBPGR Technical Guidelines for the Safe Movement of Coconut Germplasm

Addendum to the FAO/IBPGR Technical Guidelines for the Safe Movement of Coconut Germplasm (1997)

The update is based on discussions of new research results concerning viroid-like sequences in coconut, which were held at a meeting sponsored by ACIAR, the Australian Centre for International Agricultural Research, in April 1997 in Serdang, Malaysia. The addendum states “Several viroid-like nucleic acid sequences related to cadang-cadang viroid are widely distributed in coconuts and understorey plants. They are not proven disease-causing agents and should therefore not be considered to be of quarantine significance”.

Promoting Multi-purpose Uses and Competitiveness of the Coconut Proceedings of a Workshop
Chumphon, Thailand
26 – 29 September 1996

This publication contains valuable information that could promote a better understanding of the opportunities that exist in generating highly profitable coconut products.

For order requests, please contact COGENT at the address provided on the back cover of the newsletter.

Coconut riddle...

A childhood riddle asks, “What resembles a woman with unkempt hair waving in the wind?” to which any child will answer, “A coconut palm”. It is no coincidence that comparison of a coconut palm is made with a woman. For it is a motherly figure, in the eyes of hundreds of generations who have been living in the Maldives islands.

Haveeru Daily Online
November 12 1998
www.haveeronline.com
The COGENT Bulletin Board will serve two main functions: 1) to announce forthcoming activities of COGENT; and 2) to serve as a mechanism for the exchange or transfer of ideas or information.

Events
Below is the list of scheduled activities of COGENT from August to December 1999.

1. Technical Writing Course
   30 August – 3 September 1999
   Venue: Los Banos, Philippines
   Organizer: SEARCA – IPGRI/COGENT

2. Data Analysis Course
   6 – 10 September 1999
   Venue: Los Banos, Philippines
   Organizer: SEARCA - IPGRI/COGENT - UPLB

3. ADB-funded Project Annual Meeting
   13 - 15 September 1999
   Venue: Ho Chi Minh City, Vietnam
   Organizer: OPI - IPGRI/COGENT

4. IFAD-funded Project Annual Meeting
   16 – 18 September 1999
   Venue: Ho Chi Minh City, Vietnam
   Organizer: OPI - IPGRI/COGENT

5. 8th Steering Committee Meeting
   20 – 22 September 1999
   Venue: Ho Chi Minh City, Vietnam
   Organizer: OPI - IPGRI/COGENT

Questions & Answers

Mites
From: Coconut Research Institute
[SMTP: rescri@sri.lanka.net]
Subject: A new infestation in coconut - Sri Lanka

Dear Dr Batugal,

I wish to request your assistance in co-ordinating certain remedial work for a mite infestation in coconut in Sri Lanka. It is normally called as Eryophid mite and classified under Aceria. The mites damage the nut and eventually nut formation is disturbed or nut fall is experienced. Recently, this has been experienced in India. We came to know that this mite infestation has been experienced by South American countries for a long time and they have biological control methods developed. Can you please direct our request to our counterpart coordinators of South America for some assistance in finding out the methods available there?

WM U Fernando

From: Pons Batugal [SMTP: p.batugal@cgiar.org]
Cc: Zulyana; ‘Fernando, UMU’; ‘Liyanage, M de S’; Ken Riley; Paul Quek; Ramanatha Rao; ‘P G Punchihewa’

Dear Colleagues,

Dr W.M.U. Fernando, our colleague from the Coconut Research Institute, Sri Lanka, sent this urgent request for help regarding the problem of mite infestation in coconut in Sri Lanka. As this pest is also a problem in Africa and LAC, I request our colleagues from these regions to kindly provide information and advice on IPM and other control measures. Likewise, our other colleagues would have access to information and expertise in their respective institutes (i.e. mite specialists, IPM experts, project reports, etc.) that they could tap to assist Sri Lanka. As I will be traveling from 27 February to 18 March, may I request you to kindly provide needed information directly to Dr. Fernando, with copy to me so that I could follow it up as needed. Her email number is indicated in her attached original email message. Her fax number is (94)31 57391. In addition to the above, I would welcome suggestions on how we, as a group, could address this problem which is becoming more serious worldwide.

Thank you in anticipation of your priority attention to this urgent request.

Pons Batugal, COGENT Coordinator.

From: Bob.Ikin[SMTP: Bob.Ikin@aqis.gov.au]
Sent: 08 March 1999 10:16

Dear All,

I note that according to the CABI Compendium that the coconut mite was detected in 1990 but the report was unconfirmed. I am advised by the acarologists at AQIS that the most important thing is to get the mites correctly identified as the main control strategy would be biocontrol. We cannot see that spraying miticides in coconut plantations as a worthwhile occupation.

Mite (eriophids) experts for this pest are advised as - JW Amarine. Division of Plant and Soil Sciences, West Virginia

continues next page
From: Paula Angelo
Subject: Coconut embryo tissue culture

Dear Dr. Batugal,

I am writing to ask for some help. My embryo plants are suffering oxidation and browning. They develop well until 5-10 cm and after that they turn brown, dry and die. The temperature in the growing room is very high (almost 40°C during the day), the luminosity is around 40 umoles x m-2 x s-1. I am using glass tubes with 250 x 245 mm, covered with polyethylene. Could you help me or put me in contact with someone that could help me with suggestions about it? Paula Angelo

From: Pons Batugal

Dear Paula,

This is a further suggestion on lowering the temperature. If you are using fluorescent bulbs as light source for the growing plants, you may wish to explore modifying the electrical wiring so that the “ballast” of each fluorescent lamp is located outside the growing room. Normally, the ballast is the biggest source of the heat in growing rooms. Your electrician in the Centre should be able to modify your electrical wiring system as suggested.

Paula Angelo

Beetle attack in Malaysia

From: Shaharudin Saamin
Subject: Beetle attack in Malaysia

Many farmers in the heartland of coconut farms in Malaysia are facing a severe attack of the rhinoceros beetle (*Oryctes rhinoceros*) on their mature tall palms, with some farms having more than 80% of dead palms. The main contributing factor was the improper disposal of coconut trunks when the neighbouring coconut plantations began replanting with oil palm since 5 years ago. The coconut trunks have provided extensive breeding grounds for the beetles. These resource-poor farmers need help in alleviating this severe pest problem. The beetle is also causing genetic erosion of Malaysian germplasm. We would like to have your expert recommendations to control the pest.

Readers are welcome to write about issues affecting the coconut. Readers are also encouraged to respond directly to the writers or to the COGENT Newsletter. Selected letters will be featured in each issue.

This newsletter is published twice a year by the International Coconut Genetic Resources Network (COGENT).

For more information or order requests, please contact us at:

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