

FAO activities on coconut conducted by FAO Regional Office for Asia and the Pacific, Bangkok, Thailand

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Abstract

During the past 3–4 years the Food and Agriculture Organization Regional Office for Asia and the Pacific (FAO-RAP) in Bangkok has been active in funding and implementing research and development (R&D) projects on virgin coconut oil (VCO) production technologies as well as development of VCO products. With funding from FAO core and Technical Cooperation Program (TCP) facilities, six interventions for the biocontrol of the coconut hispine beetle *Brontispa longissima* were implemented in Vietnam, Maldives, Nauru, People's Republic of China, Thailand, Lao People's Democratic Republic and Cambodia. Furthermore, seminars and presentations to raise awareness of the threat of this pest were conducted in Sri Lanka and Vanuatu. Specialist meetings on *Brontispa* were organised in Bangkok (2004) and Ho Chi Minh City (2005) to focus attention on this devastating pest and the urgent need for containment and control, and to discuss approaches for a regional initiative. Separately at this meeting you will hear of the Asian and Pacific Coconut Community's (APCC) strong support in promoting awareness of this very serious coconut pest.

Virgin coconut oil

Virgin coconut oil (VCO) is a relatively new value-added product which has become available in the international commercial market for only the past 6–7 years (Bawalan and Chapman 2006). VCO offers greatly increased returns to coconut farmers over production of traditional copra or the simple selling of whole fresh nuts for coconut cream, desiccated coconut, coconut water etc. and other downstream products. Sale of VCO at the farm gate is likely to bring at least a five- to sixfold increase over the sale price of copra. The return can be much greater depending on location and the novelty of the product. Also, value-adding can be done on farm or in small farmer groups via production of soaps, lotions, medic-

inal oil, massage oils etc. Much greater profitability is achieved through this vertically integrated approach provided that careful attention is given to marketing.

As the Industrial Crops Officer for FAO in Bangkok, I took a keen interest in this VCO product because it offered another way to greatly improve returns to farmers from their coconut trees. I especially became more interested after buying, in 2002–03, five different brands of VCO in retail shops in Australia, derived from Pacific-based producers, at greatly inflated prices. On taking these oils home I was very disappointed to find that all these products were either discoloured yellow or in some cases were rancid in the container. None would meet the Philippine standards set for VCO, but also none were from the Philippines. It was not hard to conclude that there were processing problems that needed to be resolved. Even in the past 12 months inferior VCO is still to be found in the retail market.

I contacted Mrs Divina Bawalan, a very experienced food engineer (especially on VCO and its products, which she has researched for some 17 years) who was working at that time with the Phil-

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ippine Coconut Authority. I also had discussions with Dr Peesamai of the Thailand Institute of Scientific and Technological Research (TISTR), who is a pioneer of cocodiesel and biodiesel in Thailand. We, together with a TISTR team, set about conducting targeted research and development (R&D) on VCO to resolve some of these problems. In addition, new VCO products were developed by TISTR, with the FAO Regional Office for Asia and the Pacific (FAO-RAP) providing the funding.

At a later time the TISTR team, with Divina Bawalan’s assistance and FAO funding, transferred the appropriate VCO technologies to Horticulture Research Institute, Department of Agriculture (DOA), personnel at the Chumphon Horticulture Research Centre in southern Thailand. At the same time, in conjunction with the Department of Agricultural Extension (DOAE) and the village administration and farmers, an outreach village production unit was set up in southern Thailand using TISTR, DOA and DOAE trained personnel.

The many lessons learned and the outcomes of the R&D have now been compiled by Divina Bawalan and myself into a user-friendly, practical manual on VCO. The FAO manual entitled ‘Virgin coconut oil—production manual for micro- and village-scale processing’ is now available from FAO-RAP in Bangkok.

Further, transfer of the technology has begun in an FAO-TCP project in Maldives, and more is planned for a regional project involving Thailand, Vietnam and Myanmar with FAO assistance in 2006. We know this has been a long time coming but funding is always difficult. Delays have meant, however, that we are now able to promote the right technologies. Many of these technologies will be further developed and field tested in Maldives and Thailand.

The major concern is that in the rush to make quick money from VCO there are many substandard and in some cases shabby practices being put into place in various countries. We hope that the guidance on acceptable practices and advice on machinery and techniques presented in the new manual will greatly assist the production of high quality VCO and associated products.

Coconut hispine beetle

The coconut hispine beetle *Brontispa longissima* can be considered as the scourge of coconut palms—it is one of the most damaging pests of both coconut and

a range of ornamental palm species. Both larvae and adults of the beetle feed on the tissues of developing, unopened leaves of the trees. The beetle can cause significant production losses, and a high population density of the pest may result in tree death (Anonymous 2004).

Brontispa is known to have a long history in Papua New Guinea and Solomon Islands, and there is a related but less active beetle named *Plesispa* found in Indonesia. In the 20th century the beetle was accidentally introduced into several countries in the Pacific region, such as Samoa and French Polynesia, but has not reached Fiji. There is significant resistance to *Brontispa* in the indigenous Tall populations of Papua New Guinea and Solomon Islands. The pest, however, was not recorded from continental South-East Asian countries until the late 1990s when it was first detected in the Mekong Delta region in Vietnam, probably due to an accidental introduction with ornamental palms. The pest had a highly significant impact on the country’s coconut industry and on the livelihoods of small-scale farmers and their households.

With assistance from FAO-RAP, Bangkok, the larval parasitoid *Asecodes hispinarum* was collected in 2003 in Samoa, where it had been imported in the 1980s for classical biological control of *Brontispa*, and successfully introduced into recently affected countries in South-East Asia and the Pacific region (Liebregts et al. 2006). The parasitoid has become established, and results from southern Vietnam, Maldives and Thailand indicate that pest populations and damage have declined significantly to levels whereby economic damage is insignificant. Socio-economic analysis has confirmed that the cost–benefit ratio of FAO’s intervention in Vietnam alone is in the range of 1:3,000 to 1:4,000 for a 30 year period. It is likely that the parasitoid has saved the coconut industry of Ben Tre province, the largest producer of coconuts in the country. Recent and ongoing assistance to South-East Asian countries is expected to yield similar returns, particularly in Cambodia, Laos and Nauru, where FAO has assisted with control using the *Asecodes* parasite. Advice has also been given by this FAO team to Sri Lanka, Myanmar and China (Hainan Island) on control strategies, and recently to the Philippines to deal with an outbreak near Manila airport.

The parasitoid’s impact on *Brontispa* has been dramatic in the humid tropical zones in the region, and pest populations have been maintained at a low level. However, its impact in areas with a cooler and drier

climate appears to vary, despite an initially similar reduction in *Brontispa* populations within the first year following the release of the parasitoid. In these zones the *Brontispa* population density continues to fluctuate and appears to increase, in particular during the dry and cooler season. The reasons for this are not fully understood and require further study. However, this phenomenon underpins assumptions made at the commencement of FAO’s assistance in 2003 which clearly identified the need to study and identify other species of natural enemies which could be introduced to complement the control exerted by *A. hispinarum*. Despite endorsement from regional high-level meetings of the need for surveys in Indonesia and Papua New Guinea to seek other parasites, financial support has not been forthcoming. Clearly, the need to identify additional species of natural enemies has now become even more urgent.

Brontispa has continued its invasion of new areas and countries on the South-East Asian continent. In Laos the pest incursion is rapidly advancing westwards along the major highways that link the country with Vietnam. Authorities in the Philippines are attempting to control an incursion of *Brontispa* and prevent its spread to other islands. In Myanmar symptoms of *Brontispa* have been observed and the Government has requested assistance from FAO to help reduce the rate of spread and impact of the pest. It is certain that *Brontispa* will continue to spread westwards into Bangladesh and India, and possibly even to Africa.

We are of the view that the *Brontispa* incursion should be considered a regional emergency, and therefore requires priority action. The processes to request funding support from FAO and other donors, however, are slow and success is not assured. This means that until now we have only been able to apply reactive approaches, by acting only after an incursion into a new country has occurred. Although our responses are becoming faster, significant damage to coconuts and direct impact on the incomes and livelihoods of the rural producers will continue to occur if we proceed in this way. But we believe that there is another, more proactive approach that is based on a strategy to release the natural enemies in the incursion ‘frontline’ of the pest. This strategy would allow the parasitoids in their own capacity to closely follow the outward migration of *Brontispa*, and prevent the build-up of large damaging populations of the pest in new incursion areas. Such a strategy may be best addressed through a regional approach, to include not

only countries where *Brontispa* is present now but also those that are under direct threat of incursion. The FAO, possibly with assistance from the APCC or other regional organisations, is keen to assist with such an initiative, which will help maintain the livelihoods of rural farmers and their families in the region. The coconut hispine beetle is now classified as an invasive species and a regional assistance effort is urgently needed to prevent its spread to other parts of the Indian Ocean and Africa.

Recently, a manual entitled ‘Mass rearing of the coconut hispine beetle (*Brontispa longissima*) and its natural enemy (*Asecodes hispinarum*)’ has been produced by FAO-RAP and is available from the Bangkok office. Also a video on the same methodologies is nearing completion and will be available from FAO-RAP in June–July 2006.

Conclusion

Over the past 5 years the FAO-RAP has had a very defined commitment to the production of high quality VCO via improvement in technologies for processing and product development. This commitment continues in a number of countries in the Asia–Pacific region with FAO assistance (Bawalan and Chapman 2006). An FAO manual entitled ‘Virgin coconut oil – production manual for micro- and village-scale processing’ is now available from FAO-RAP in Bangkok.

Another key activity of FAO-RAP has been focused on biocontrol of the coconut hispine beetle *Brontispa longissima* with the parasitoid *Asecodes hispinarum*, and strategic measures aimed at quarantine and prevention of the transport of palms and cycads which are hosts of the beetle (Liebregts et al. 2006). FAO has assisted Vietnam, Laos, Thailand, Nauru, Maldives and Cambodia with direct action projects and has provided advice to the Philippines, Myanmar and People’s Republic of China on strategies for control. The coconut hispine beetle is now classified as an invasive species and a regional assistance effort is urgently needed to prevent its spread to other parts of the Indian Ocean and Africa.

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