

## A MULTI-TALANTED COCONUT GROWER AND INVENTOR OF AGRICULTURAL MACHINERIES IN SRI LANKA – APCC AWARDEE

*W.K.N. Shanthichandra*

Dr. Philip Rayvatha Wijewardena, a coconut planter, innovator of farm mechanization, bio energy application, soil fertility management and engineer by profession, was one of the awardees in the 45th Asian and Pacific Coconut Community (APCC) Annual Session/ Ministerial Meeting held in Colombo, Sri Lanka from 2nd - 5th December 2008. The APCC awarded Plaques of Recognition to three outstanding individuals namely, Dr. Philip Rayvatha Wijewardena, Dr. P.G. Punchihewa and Dr. D.P. Athukorale for their remarkable contributions to the development of the coconut industry in Sri Lanka. The Hon. Minister D. M. Jayaratne, Ministry of Plantation Industries, Government of Sri Lanka, Hon. Minister Taua Tavaga Kitonga Seuala, Ministry of Agriculture and Fisheries, Government of Samoa, Mrs. Indrani Sugathadasa, Secretary, Ministry of Plantation Industries, Sri Lanka, and the APCC Executive Director, Mr. Romulo N. Arancon, Jr. together with other officials and ministers, awarded the plaques during the Inaugural Ceremony.

In 1988, Dr. Ray Wijewardena was conferred by the Government of Sri Lanka, with Presidential Honours titled "**Vidya-jyothi**" in recognition of the services he rendered in the field of Science and Technology, and also with National Honours titled **Deshamanya** in November 2005.

He is an old boy of St Thomas' College, Mount Lavinia, Sri Lanka. He graduated from three engineering disciplines namely,



*Dr. Philip Rayvatha Wijewardena in his Coconut Garden in Kakapalliya, Sri Lanka*

Aviation, Mechanical and Agricultural Engineering in the University of Cambridge, UK. He completed his Master's degree in Business Administration from the Harvard Business School, USA. He was bestowed an Honorary Fellowship of Silsoe College, University of Cranfield (UK) in 1994. In recognition of his contributions to Science and Technology, he was conferred with an honorary degree of Doctor of Science from the University of Moratuwa, Sri Lanka in 1994.

Dr. Ray Wijewardena is a coconut grower, owns 148 acres of coconut farm called the "Kohomba Estate" in Kakapalliya, Chilaw, Sri Lanka. This model farm is a resource base for researchers to brush up their knowledge on agronomic practices, information centre for farmers/ growers and also for

new comers in the coconut industry. As a coconut grower, he implements his own agricultural practices to manage his coconut estate. In his acceptance speech in the APCC award ceremony, he said that we are now re-learning the simple priorities of first growing our own fertility, and then growing our own food and fuel-crops. In that order we could greatly reduce the costs involve. We have come to realize a new care and husbandry of the lands with which we are privileged to have been entrusted.

As a result of his good agricultural practices, the coconut yield of his coconut estate is more than 8000 nuts per acre per year. His coconut palms yield about 14-15 nuts per month.

In the Kohomba Estate, he maintains two different coconut



Dr. Philip Rayvatha Wijewardena Receiving the Plaque of Recognition from APCC

rows namely the fertility row and the alley row consecutively. In the fertility rows, *Gliricidia* and wild sunflower plants are grown in between the coconut plants. The combination of *Gliricidia* leaves, coconut husks, with wild sunflower leaves are used as an organic fertilizer in these fertility rows. This row adds plant nutrients such as nitrogen, phosphorus and potassium and organic matter to the soil and increases crop productivity even in non-fertile and degraded soils.

The leaves of this fast growing leguminous tree *Gliricidia*, contain nutrients: N (2.4%), phosphorus (P) (0.1%), potassium (K), (1.8%), calcium (Ca), and magnesium (Mg) and also has good potential as fodder for livestock. Likewise, *Gliricidia* is used for timber, firewood, medicinal purposes, charcoal, living fences, and plantation shade. Use of *Gliricidia* as green manures minimizes the usage of chemical fertilizers that are very expensive and which are also not environment friendly.

The alley row is used by bullock carts, tractors or small lorries and coconut harvesters/ workers to

harvest and collect coconuts, husks and organic fertilizer etc. These rows are kept clean by harrowing weeds for transport purposes.

This practice increases organic matter content in the soil which improves the physical structure of the soil, restores and improves the soil fertility, allows the water to infiltrate into the soil more quickly rather than run off the surface, reduces soil erosion, enriches microbial activity, attracts deep-burrowing earthworms already present in the soil and improves water holding capacity. It also increases nutrient availability in the soil due to production of CO<sub>2</sub> and organic acids during decomposition of the plant material. It enhances plant growth, crop yields and also reduces environmental risks associated with chemical fertilizers.

Since there is almost zero application of inorganic fertilizers and also less application of chemicals to control weeds, pests and diseases, the cost of production remains low throughout the year.

Therefore, it has become a profitable coconut estate.

DR Wijewardena, once said that he uses only *Gliricidia* mainly as an organic fertilizer in his coconut plantation. He never uses urea in his plantation. Based on the sale of wood and leaves alone, a *Gliricidia* plantation is viable and the use of leaves as fodder increases the income in several folds. In addition, having a mixed plantation synergizes value of both crops. This is a gold mine. This makes good economic sense.

He has invented and installed a small gasfire machine which requires 6 kg of fire wood per hour as fuel in the Kohomba Estate to generate electricity for the day to day use of his estate. *Gliricidia* woods/stems from his estate are used as a fuel for this machine. The electricity generated by this machine is used to operate water pumps to irrigate coconut plants and also for the other cash crops during the dry season. The excess electricity is used for his office and for the quarters in the estate premises. Moreover, he uses his electric car to travel from Colombo to the Kohomba Estate, suburbs and back to Colombo. When he comes to the estate, he charges the battery of his car by using the electricity generated by this gasfire. By doing so, he gives a good message to the world, on the usage of renewable energy for farming, and for day to day uses.

Dr. Ray Wijewardena's accomplishments in the sphere of engineering are remarkable. His first innovation was the world's first two wheeled tractor- the Landmaster two wheeled tractor, which he pioneered in Nottingham in 1955. This is a very popular farm machinery and during the 1960s and early 1970s, over 300,000 units was sold in 27 countries including Sri



*Glyricidia Planted between Rows to Improve Soil Fertility*

Lanka, United Kingdom, Australia, Philippines, Malaysia and Japan. The first two wheeled tractor model, made by Dr. R. Wijewardena displayed in his Bopitiya Coconut Estate, Bopitiya, Sri Lanka. This estate is presently managed by the Coconut Cultivation Board, Sri Lanka as its coconut seed garden. Furthermore, Vidyajothi Dr. Ray Wijewardena, pioneered the proposal of a power generation roject fueled by biomass energy or dendro thermal energy to supply the national grid of the country's electricity. He logically proved that dendro-thermal electricity generation could be economically competitive with fossil fuel or even coal fired electricity generation. Certain minimal government interventions are initially needed to get this large-scale process on the ground.

Therefore, he became the father of dendro power generation in Sri Lanka by proposing and pushing the programme. His efforts over two decades came into fruition in 2003 and foundation was layed for the first ever biomass power generation plant with the capacities of 01 MW at Walapane, Sri Lanka. Research and development in this sector is being conducted by the Bio Energy Association of Sri Lanka and the Ministry of Science and Technology with private sector assistance. A 35 KW (kilo watts)

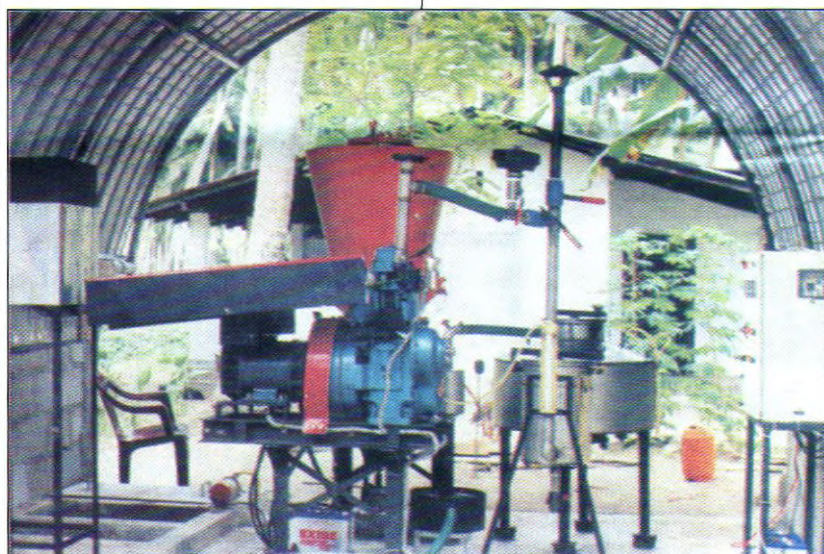
demonstration plant is situated at Sapugaskanda. Lanka Bio Energies Ltd. will be established in Hambantota, Sri Lanka.

Both projects have planned to utilize the sustainably grown fuel wood (SGF) such as gliricidia, ipil ipil, acacia by the rural community of the respective areas together with other input materials found in the locality. It is relatively recent that national energy policies have seriously accepted that fuelwood-based energy production can provide an economically viable alternative to expensive oil imports as well as providing a useful source of income to farmers and commercial growers. Additional studies have been conducted by the Coconut Research Institute

who is interested in a more efficient use of the site through 'under planting' with fast growing leguminous tree species both for the production of energy crops and for green manure.

He also took initiatives to introduce wood fired gassifier technology to the Desiccated Coconut (DC) industry to retain its competitiveness in the global market through the reduction of cost of production. In addition to the direct benefit to the DC industry, promotion of wood fired gassifier technology will derive multiple benefits such as the creation of an additional income source to the rural community by making them involved in the growing of commercial wood. Furthermore, it will derive local as well as global environmental benefits from the reduction of greenhouse-gases. The DC industry currently consumes approximately 10 GWH of electricity from the national grid, around 12 million liters of fuel oil and coconut shell as energy source.

The innovative thinking of Dr Wijewardena and his services are much in demand both in Sri Lanka and abroad. He was appointed Head of Agricultural



*Gassifier Invented by Dr. Ray Wijewardena Installed in his Coconut Farm*

Engineering at the Agricultural Engineering Research and Development Institute in Malaysia, a Research Institute set up by the Food and Agriculture Organisation of the United Nations. He served in this post during the years 1972 and 1973. From 1974 to 1980, he served as Head of the Agricultural Engineering and Research Division of the International Institute of Tropical Agriculture based in Nigeria.

Back in Sri Lanka in the 1980s and early 1990s, he served in the Tea Research Board as Chairman, and also as a member, Mahaweli Authority, Coconut Development Authority, Coconut Research Board, Presidential Task Force on Science and Technology, and Arthur C. Clarke Centre for Modern Technologies.



*Two Wheel Tractor Invented by Dr. Ray Wijewardena*

He has been the author of several publications on Conservation Farming including Management of Weed and Fertility yielding Maximization of Agricultural Productivity based on his

innovative and revolutionary concepts and philosophies on farming methods that are appropriate to the tropics.

Dr. Ray Wijewardena, a person of multi-talents, was placed fourth in Yatching at the Mexico Olympics in 1968, won a Silver Medal at the Asian Games in Bangkok. One of his hobbies includes designing and making aircraft and testing in the air. He has contributed practical skills and innovative thinking to Air Transportation appropriate to humid tropical countries such as Sri Lanka, invoking fixed wing, power driven and auto driven rotor aircraft. He served as the Chancellor, University of Moratuwa, Sri Lanka in 2002

Dr. Ray Wijewardena is a Scientist and an Agricultural Engineer whose vision is focused several decades into the future, penetrating the superficial symptoms, to the roots of problems perceived in the present. Ayuboho wewa!! Ayurakkanthu Awada!!!

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*Two wheeled tractors used for ploughing and transportation in Sri Lanka*