

FOREWORD

Research on coconut has a long history in India dating back to 1916 when three Research Stations were established at Pilicode, Nileswar and Kasaragod in the erstwhile Madras Presidency. The development of hybrid varieties involving tall and dwarf types possessing prolificity and precocity is a major landmark in the annals of coconut improvement. It was the pioneering work of Dr.J.S. Patel and his team of scientists that paved the way for the exploitation of heterosis in coconut.

To commemorate the Golden Jubilee of the establishment of the first ever coconut hybrid plantation in the world at the Nileswar station which is now under the Kerala Agricultural University, a National Symposium was held on Coconut Breeding and Management during 23-26, November 1988 at the University Headquarters at Vellanikkara. The aim of the symposium was to bring together research, extension and development personnel working on the research and development aspects of the crop so that their interaction in the light of research experience could lead to the formulation of future strategies. Delegates from India, Sri Lanka, Malaysia, the Philippines, Bangladesh, Ivory Coast, France and the United Kingdom and international organizations such as IBPGR participated in the symposium. Indepth discussions were held on the cardinal aspects including breeding for higher yield and disease resistance, crop management, biotechnology and processing technology. Based on research results and deliberations certain important recommendations were drawn up in the plenary session of the symposium.

The proceedings of this symposium brings together a considerable quantum of scientific information on various aspects of coconut breeding and management. Status papers evaluate the current state of coconut research throughout the world and the future lines of work envisaged.

During the Inaugural Session of the symposium, a few pioneers of coconut research in India were honoured. They were Dr.J.S. Patel, Dr.K.M. Pandalai, Mr.A.P. Anandan, Mr.P.M. Sayed, Dr.C.A. Ninan, Mr.K.P.P. Nambiar, Prof.K. Kannan and Mr.K. Satyabalan. I am thankful

to them for accepting the honour offered by the Kerala Agricultural University in recognition of their contributions in the field of coconut breeding and management.

I gratefully acknowledge the co-operation extended by the Central Plantation Crops Research Institute (CPCRI), Kasaragod, Coconut Development Board, Cochin, Council of Scientific and Industrial Research (CSIR), New Delhi, Department of Biotechnology, New Delhi, Kerala Kerakarshaka Federation (KERAFED), Trivandrum, Kerala State Coconut Development Corporation, Trivandrum, State Committee on Science, Technology and Environment (STEC), Trivandrum and the State Department of Agriculture, Trivandrum in organizing the symposium. I also wish to convey my sincere thanks to the participants of the symposium and to all those who made the symposium a success.

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Hon'ble Minister for Agriculture Sri. V. V. Raghavan, Special Director General of ICAR Dr. M. V. Rao, Distinguished Delegates, Ladies and Gentlemen,

The coconut palm known as *Kalpa Vriksha* or tree of heaven is of great antiquity in India. Every part of the tree is useful to man and it provides livelihood for millions of people in the country. India is the third largest coconut producing country in the world contributing 18 per cent of the global nut production. The annual production is 6404 million nuts from an area of 1.23 million hectares and about half of the total production is from the state of Kerala.

Coconut research in India gained momentum when the Government of the then Madras Presidency established three coconut research stations at Nileswar and one at Kasaragod in 1916 which are now located in the Kasaragod district of Kerala. With the constitution of the Indian Central Coconut Committee, the Kasaragod station was handed over to the Committee in the year 1947 and later became the Central Plantation Crops Research Institute under the Indian Council of Agricultural Research. Another research station was set up at Kayamkulam in 1948 which now forms the Regional Station of the CPCRI. Two research stations were started at Kumarakom and Balaramapuram under the State Department of Agriculture, Travancore during the year 1947 and 1948 respectively. In 1972, when the Kerala Agricultural University was formed, two research stations of Nileswar and the research stations at Kumarakom and Balaramapuram were handed over to the University.

Efforts to collect, conserve and multiply germplasm from all possible sources have been in progress since the commencement of research on coconut in 1916. The present Indian germplasm consisting of 86 exotic and 41 indigenous accessions is one of the world's largest collections of this crop. Research on varietal improvement undertaken during the last three decades has enabled evolution of high yielding cultivars. Identification of elite palms and selection of prepotent West Coast Tall palms based on progeny testing resulted in considerable improvement of the traditional cultivar. Perhaps, the most outstanding achievement in coconut research was attained by the advent of hybrid vigour in crosses involving tall and dwarfs. The hybridization programme was started in early thirties and India was the first to produce coconut hybrid in 1932 at the Coconut Research Station, Nileswar. The earliest plantation of coconut hybrids (T x D) in the world established at Nileswar continues to give very satisfactory performance even after fifty years. Further research on hybridization made possible to release a number of Tall x Dwarf and Dwarf x Tall hybrids which give yields up to 65 per cent more than the West Coast Tall. Some of them perform well under drought conditions also.

A comprehensive programme to set up a net work of seed gardens in different states and to produce high yielding varieties and hybrids has been planned and is now under various stages of implementation. The approach adopted is to have appropriate dwarfs as females in required areas in large blocks and the selected tall

in another block away from dwarf. Adopting a simplified pollination technique, massive production of hybrid seeds in such gardens is now possible. Multiplication of elite palms through seed has inherent limitations. Same is the case with plants which are resistant to diseases. Tissue culturing of coconut, research on which is already in progress, should be made into a reality so as to propagate palms of high genetic potentials as well as disease resistance.

The response of coconut to different management practices has been studied under a variety of situations. Substantial increase in yield may be made by adopting the recommended management practices. Similarly, the beneficial effect of irrigation on nut production has been quantified to range from 74.2 per cent to 209 per cent in various types of soils. The enhanced coconut production due to the favourable interaction between irrigation and manuring is indeed substantial. With a view to maximising production per unit area, coconut based farming systems have been studied and systems suitable for various situations have been evolved.

In spite of the above accomplishments, statistics on coconut production in the country reveals that the production remains rather stagnant since seventies and the present production is only marginally higher than the production level of 1970-71. The demand for coconut in the country by 2000 AD is estimated at 12172 million nuts, roughly 100 per cent more than the present production. To achieve this projected demand, the growth rate of coconut production has to be reasonably high. The genetically superior hybrids and cultivars have to be fully utilized to attain this desired goal. The present rate of production of hybrid seedlings appears to be inadequate to meet the increasing demand. Every effort should be made to overcome this constraint by streamlining the present systems of generating planting materials, full utilization of existing mother palms and establishing more seed gardens in the coconut growing states. The technique of micropropagation through tissue culture should be perfected.

Kerala being the major coconut growing state, the over all increase in production will mainly depend on the performance of the crop in this State. About 40 per cent of the area under coconut in Kerala is in the grip of the root (wilt) disease and therefore production and productivity programmes in the country should give considerable importance to disease management. Management practices, irrigation, expansion of area to the extent possible, product diversification and byproduct utilization are other areas requiring immediate attention for necessary improvement.

I hope that the deliberations of this National Symposium on Coconut Breeding and Management organized by the Kerala Agricultural University will provide solutions for the above constraints and will help to increase the production and productivity of the crop in the country.