CURRENT RESEARCH PROJECTS AT PORIM: BIOLOGY

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32A

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INTRODUCTION

Research at PORIM is geared towards fulfilling the needs of the Malaysian palm oil industry. This entails increasing production efficiency, improving quality and increasing the variety of uses of palm oil while improving existing uses and widening and strengthening palm oil markets throughout the world. Three main aspects are emphasised *i.e.* Biology; Chemistry, Technology and Nutrition; and Techno-Economic Studies and Technical Advisory Services.

Currently, a total of 107 research projects are being carried out and these projects are listed in three separate PORIM Information Series.

PROJECT NO.	TOPICS
Agronomy & Soil Fertility	
BD1 - 2.1.1 (74)	Investigation into the Nutrition of Oil Palm
BD1 - 4.1.1 (81)	Investigation into the Decomposition and Mineralization of Empty Oil Palm Fruit Bunches and their Use as a Source of Mulch for Oil Palm
BD1 - 2.3.3 (84)	Micronutrient Nutrition of Oil Palm on Peat
BD1 - 2.6.3 (84)	Fertilizer × Density Trial on Peat
BD1 - 2.6.6 (84)	Potassium (K) Fertilizer × Land-Preparation Trial on Peat
BDO - 2.3 (85) Part I	Effect of Removal of Pruned Fronds (petioles) from Oil Palm Plantation on the Production of FFB
BD0 - 2.3(85) Part II	Effect of Removal of Pruned Fronds from Oil Palm Plantation on the Production of FFB
BD0 - 4.4.2 (80)	Monitoring the Long-Term Effects of Land Application of Palm Oil Mill Effluent
BD1 - 2.4.4 (82)	Evaluation of Urea as a Source of Nitrogen Fertilizer for Oil Palm
BD1 - 2.4.5 (92)	Evaluation of Different Source of P Fertilizer for Oil Palm
BD1 - 2.5.5 (82)	Observation Block Network. Part 2: Verification of Fertilizer Recommendations.
Farm Mechanization	
BD3 - 2.3 (82)	In-field Transportation of Fresh Fruit Bunches of Oil Palm
BD3 - 6.2 (90)	Study on the Extent of Soil Compaction Caused by Wheeled Traffic in Oil Palm Plantations

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BD3 - 7.1 (91)	The Design and Test of an Oil Palm Trunk Pulverizer for Oil Palm Clearing
BD3 - 2.4 (91)	Design, Fabrication and Field Trial of Loose Fruits Collecting Machines
BD3 - 3.2 (93)	Design, Fabrication and Field Trials of Harvesting Machine

Entomology & Mammalia

BD6 - 1.2.1 (82)	A Study on the Biology and Population Dynamics of *Elaeidobius kameruncius* in Malaysia
BD6 - 1.3.2 (85)	Integrated Pest Management of Bagworm a. Biology and population dynamics of bagworms b. Pest monitoring by using ultra violet light traps, suction traps and sweep nets c. Biological control of bagworm using parasitoids d. The use of *Bacillus thuringiensis* for the biological control of bagworms e. The use of entomopathogenic fungi for the control of Bagworms f. Mammalia – The use of owls for rat control

Pathology and Weed Science

BD6-2.1 (84)	Studies on the Biology of *Ganoderma* Pathogenic to Oil Palms
BD6 - 2.2.2	Investigation of Fungicides to Control *Ganoderma*
BD6 - 2.2	Investigation on Biological Control of *Ganoderma*
BD6 - 2.3.1	Early Detection of *Ganoderma*

By-Product Utilization

BD0 - 0.2.2 (82)	Conversion of Oil Palm By-Products into Value Added Products a. Reconstituted boards such as moulded particleboard, cementboard and fiberboard b. Pulp and paper production c. Oil palm lignocellulosic materials as reinforcement in thermoplastics d. Fibrous value-added product items from EFB fibres

Breeding and Genetics

BD2-1 (1987)	Utilization of Nigerian prospected material
BD2-2 (1984)	Evaluation of Cameroons and Zaire germplasm
BD2-3 (1986)	Evaluation of Madagascar and Tanzania germplasm
BD2-4 (1991)	Establishment and Evaluation of Angola Germplasm
BD2-5 (1992)	Collection of Oil Palm germplasm in Senegal, Guinea-Conakry, Gambia, Sierra Leone and Brazil
BD2-6 (1981)	Evaluation and Utilization of *E. oleifera* Genetic Material collected in Central and South America
BD2-1.7	Interspecific Hybridization of *E. guineensis* × *oleifera*
BD2-1.8	Collection, Establishment and Evaluation of Other Palm Species of Possible Economic Importance
BD2-9 (1985)	Improvement of Selected Methodology in Oil Palm Breeding
BD2-10 (1985)	Oil Palm Population Improvement

BD2-11 (1993) Genetic Variability of Natural Oil Palm (*Elaeis guineensis*) Populations from Nigeria Using Molecular Markers

Physiology

BD4 - 2.1.3 (89) Photosynthesis and Productivity of Oil Palm.
- a. Productivity study of mature palms on inland sites
- b. Productivity study on a coastal site using micrometeorological techniques
- c. Productivity study on an inland site using micrometeorological techniques
- d. Modelling studies using GPHOT and other models
- e. Carbohydrate reserves in oil palm

BD4 - 3.2.5 (83) Root Physiology
- a. Root biomass and root productivity at the coastal micrometeorological study site
- b. Studies on root growth in the field using observation win dows

BD4 - 4.2.6 (93) Investigation into the flowering and fruiting of oil palm

Fundamental Tissue Cultue

BD5 - 1.1 (80) Vegetative Propagation
- a. *In vitro* Studies in relation to abnormalities
- b. Incidence of abnormalities
- c. Reversion in abnormal palms
- d. Alternative method of propagation
- e. Biochemical studies
- f. DNA methylation
- g. Endogenous growth substances
- h. Protein analysis
- i. Effects of growth substances on palms

BD5-1.3 (85) Germplasm Storage *in Vitro*
- a. Cryopreservation
- b. Growth limitation

BD5-1.6 (92) Molecular Markers for Detection of clonal abnormalities in oil palm

BD5-1.7 (94) Suspension Culture as an Alternative Method for Oil Palm Propagation

Applied Tissue Culture

BD5-1.4 (92) Large-Scale Production of Oil Palm

BD5-1.5 (92) Alternative Methods of Cloning

Biotechnology

Genetic Engineering of Oil Palm for High Yield and Quality

BD9-7 (89) 1. Biochemical studies

Fatty acid biosynthesis in the oil palm mesocarp

BD9-10 (90) 2. Gene isolation

Isolation of Oil Palm Acyl Carrier Protein (ACP) Gene(s) and Its Regulatory Sequences

BD9-2 (84) 3. Oil Palm Transformation

Protoplasts as a Tool in Biochemical and Genetic Studies

BD9-8 (89) In *vivo* Oil Palm Transformation

BD9-9 (90) Transformation Using Cell and Organ Cultures

BD9-13 (93) Optimization of Transformation Techniques to Obtain Transgenic Oil Palm Plants using Microprojectile Bombardment of Embryogenic Calli and Suspension Cultures

BD9-6 (89) Lipase Activity in the Oil Palm Mesocarp

BD9-12 (90)	Gene Expression During Flower Development in Oil Palm a. Isolation of genes controlling flower development b. Isolation of flower-specific proteins
BD9-5 (86)	Molecular Probe Techniques for the Oil Palm a. Restriction fragment length polymorphism (RFLP) b. Random amplified polymorphic DNA (RAPD) c. DNA fingerprinting d. Microsatellites e. Assessment of genetic variability using molecular probes f. Application of molecular probes in oil palm tissue culture
BD9-14 (93)	Development of Genetic Linkage Maps in Oil Palm

Smallholders Development and Transfer of Technology

Training and Communication

BD8-1.1 (92)	Oil palm courses for extensionist
BD8-1.2 (92)	Oil palm courses for farmers
BD8-2.4 (92)	Leaflets/printed materials
BD8-2.3 (92)	Exhibition
BD8-2.5 (92)	Radio/TV Programme
BD8-2.6 (92)	Hotline

Extension and Project Implementation

BD8-1.3 (92)	Talk/dialogue
BD8-3.1 (92)	Demonstration Plots
BD8-3.6 (92)	Survey on Production Practices of Oil Palm Smallholders
BD8-3.6 (92)	Survey on the Use of Barn Owl for Rat Control in Oil Palm Plantation
BD8-3.3 (92)	Intercropping Oil Palm with Rattan
BD8-3.3 (92)	Intercropping Oil Palm with Medan Teja
BD8-3.3 (92)	Hedge Planting of Rubber with Oil Palm
BD8-3.4 (92)	Integration of Deer with Oil Palm
BD8-3.5 (92)	Adoption of Problem Holdings

Advisory and Consultancy Services

BD8-2.1 (92)	Advisory Visit
BD8-2.2 (92)	Consultancy Services

For more information kindly contact:

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