R&D Overview

FGV owns one of the largest oil palm research centres in Southeast Asia, positioning itself as the leader of innovation and scientific research in the oil palm industry.

R&D in FGV has been an integral part of the Malaysian oil palm industry. It traced its history back in 1972 when Tun Razak Agricultural Research and Development Centre was officially opened in Pahang by the former Prime Minister of Malaysia, Tun Abdul Razak Dato' Hussein. It was established to address the need for science-driven agricultural innovation to leverage on nature's bounty to bring prosperity to the nation.

FGV has since consolidated over four decades worth of research expertise towards becoming a front-runner in the oil palm research and this has culminated in one of South East Asia's largest Biotechnology Centre, FGV Innovation Centre (FGVIC) in Bandar Enstek, Negeri Sembilan. The Centre specializes in the production of oil palm clones with specific traits and focuses in bio-molecular marker research. This led to the pioneering of marker assisted oil palm breeding and selection which will ensure that its current award winning oil palm germinated seeds, FGV Yangambi ML161 and FGV 3 Way continue to remain as the market leader in Malaysia by supplying more than 40% of

the country’s annual germinated seed requirements.

We have also established bio-fertilisers, bio-pesticides and bio-augmentation using beneficial microbes and other biological agents through our R&D initiatives at the Beneficial Microbes Centre established in 2011.

R&D activities in FGV covers our entire supply chain to improve yields, milling processes and customize our downstream products. It includes improving the yield of selected crops through breeding, tissue culture, agronomy and crop protection in a sustainable manner; optimizing waste and by-products with an aim to generate new products with higher-growth, in higher-margin industries; and the provision of high quality agro-based products and services.

Our initiatives are further intensified with research and development in technology related to engineering, milling, biomass, food, oleochemicals and industrial biotechnologies, to be adopted in both the upstream and downstream segments. The aim is to not only improve quality, productivity and efficiency of FGV’s operations, but to also create and tap into new revenue streams.

53 Years

Experience

in oil palm breeding and oil palm germinated seed production since 1970.

Premium Planting Materials through R&D in Oil Palm Breeding Programme & Biomolecular Research

FGV has strong R&D capabilities in oil palm breeding and utilises advanced genomics, cloning, and big data analysis tools for crop improvement through molecular breeding and oil palm DNA fingerprinting.

Oil Palm Seed and Seedlings

YANGAMBI ML161

FGV Yangambi ML161 is a high-quality planting material cultivated to meet the oil palm industry’s demand for abundant fruit bunch (FFB) production and high oil yield.

FGV Yangambi is derived from Deli Dura x Yangambi pisifera palm ML161 crosses, and has shown conclusively to combine well for excellent FFB and oil yield results. It is the most highly demanded oil palm planting material in the industry. Since 2008, FGV Yangambi has been awarded Brand Laureate Award-Best Brand in Agriculture for eighth times.

YANGAMBI 3 WAY

FGV Yangambi 3 Way is the newest DxP FGV variety, a result of long breeding scheme and released in 2008. The variety comes from three breeding lines. The Dura line is a result of the introgression of Dura Nigerian (MPOB) and Dura Deli Group, whilst the pisifera line comes from the Yangambi ML161 family.

The advantages of Yangambi 3 Way are a slightly small bunch with high number of bunches per palm and high oil yield (CPO and kernel) per hectare. FGV Yangambi 3 Way is highly recommended for high density planting of 148 palms/ha to 160 palms/ha.

Discover More

Cloning Through Tissue Culture

Plant Tissue Culture

Oil Palm

FGV’s involvement in tissue culture began in the 1980s. Since 2010, the FGV Innovation Centre (FGVIC) has successfully produced 1.0 million oil palm ramets annually. Oil palm cloning exploits genetic variabilities within crosses to derive high-yielding planting materials.

FGV generates oil palm clones from best individuals from best crosses. Ortet selection is based on stringent criteria for which the ortets must have oil to bunch ration (O/B) greater than 32% and high bunch numbers. Ramets exhibit vigorous and uniform growth with very low somaclonal abnormalities, <5%. It also produces high oil yield with average of 20% more oil per hectare than commercial DxP materials.

Other crops (Rubber, Pineapple, Sugarcane, Banana and others)

FGVIC has also actively produced banana clonal seedlings to accommodate the varied needs of customers. FGVIC has developed, through its intense tissue culture research activities its very own “secret recipes” such as PLANTgerminus and EZgrow.

These products are successfully used in FGVIC for in vitro oil palm tissue culture processes at all stages such as, callogenesis, embryogenesis, shoot development and rooting success. These products have also been used for developing other crops as banana, pineapple, ‘tongkat ali’, rubber and

sugarcane.

Discover More

Agronomy Research & Advisory

Agronomic Services

Our Agronomic Advisory Services has recommended good agricultural practices (GAP) to achieve the actual potential yield from various aspects of palms including palm healthiness, manuring activity, moisture conservation, weeding, as well as pest and disease control.

We are currently servicing approximately 1.0 million hectares of oil palm and rubber plantation in Malaysia and abroad.

Replanting Advisory services

The preparation of oil palm replanting is the most important step to achieve the high productivity of the oil palm trees. Our experienced agronomists offer advisory services to ensure planters benefit from their investments in planting oil palm.

Technical nursery advisory visit

We offer professional advice on good oil palm nursery management to ensure oil palm germinated seeds grow healthy and provide the best quality of oil palm trees in the field.

Integrated Pest & Disease Management

Maximise yield by minimising crop losses through the application of integrated pest & disease management. The research includes rats controls management, barn owl as biological control, rhinoceros beetle management, bagworm management, and biosolution.

Agricultural inputs derived from this research

are:

Ratbaits – BUTIK S and BUTIK G2

We produce effective rodenticide baits for rat control. The products with brand name BUTIK S (active ingredient- Chlorophacinone) and BUTIK G2 (active ingredient- Bromodiolone) are highly effective against all types of rats species. By incorporating good baiting methods, these rat population controls are cost and labour effective compared to other control methods.

Rhinoceros Beetle control- ORY-X

ORY-X contains spore *Metarhizium Anisopliae (M. anisopliae)* which has been proven to be highly pathogenic to rhinoceros beetle. This spore with high viability exceeding 80% has been produced through a high quality process from production up to field application. This product has proven not only to reduce pest management cost but also an environmentally friendly.

Discover More

Beneficial Microbes & Plant Growth Enhancer

PALMA GRO

Plant growth enhancer
This product contains Arbuscular Mycorrhizae Fungus that has the ability to colonise palm roots system to promote the development of healthy and functional root hair. The symbiosis will increase water and nutrient uptake efficiency of the palms that improves plant growth and yield.

PALMA SHIELD

A potent biocontrol agent for Ganoderma
A potent Biocontrol agent for ganoderma Basal Stem Root (BSR) disease in oil palm that contains Trichoderma asperellum M103. This product also enhances vegetative growth, helps soil

amendments, and improves nutrient uptake ability as well as boosts soil decomposition and biodegradation.

TEKAM ORGANICS

Tekam Organics is a fortified organic fertiliser that has proven to reduce inorganic fertiliser usage. It contains organic matter that provides nutrients and habitat for soil that helps stabilise pH in increasing microbial activity. It also contains trace elements Cu, Zn, Mn and Fe which are important for plant growth and the ability to fight disease. This product is suitable for organic farming ground, improves soil structure and has a water holding capacity benefits.

Discover More

Advanced Technologies For Efficient Estate And Mill Operations

Our research includes automation and mechanisation of daily operations to improve productivity and efficiency in FGV’s operations. In line with Industrial Revolution 4.0, we deploy advanced technology for precision agriculture in geospatial technology applications for oil palm replanting.

It produces an accurate replanting blueprint at the oil palm replanting area with automatic palm count information which can later be used as a base map in estimating total fertilisers per hectare, estate management, and plant health monitoring. This technology also includes proactive plant health monitoring using precision tools.

New Strategic Crops

We conduct research for alternative high-value crops such as banana, pineapples, jackfruit, durian, mangosteen, mesta, and others that involve germplasm breeding, technical advisory on agronomy, pest and disease control and post-harvest technology. We also produce and supply elite planting materials for commercial planting in FGV and external markets.

Food Technology

To create more value of palm oil at the downstream level, our Food Technology research is focusing on innovating new food products for current and potential markets, with added-values for consumers. Using refined bleached deodorised palm oil (RDBPO) as the feedstock, many potential palm-based fractions can be derived and applied in producing many types of food products such as margarine, vanaspati, fluidized palm oil, cocoa butter substitute, salad dressing, shortening and others.

Oleochemicals & Biochemicals

Our oleochemicals and biochemicals research focuses on basic oleochemicals and specialty derivatives, improvements of palm oil midstream processing, personal and home care product formulation and applications, palm-based product for animal feed applications, biochemicals and fermentation products, and biodegradable plastics. We continue to support our operations and also leverage on various collaborations with industry players.

Research & Development’s

Subsidiaries

FGV Agri Services Sdn. Bhd.

FGV Fertiliser Sdn. Bhd.

FGV R&D Sdn. Bhd.

FGV Applied Technologies Sdn. Bhd.

* The list of subsidiaries is not comprehensive. Further details on the equity shareholdings of FGV in its subsidiaries can be referred to in the Financial Statements

Joint ventures or Associated company