

ASIA PALM OIL

PALM OIL INDUSTRY AND TECHNOLOGY NEWS

FGV Submits Petition to US
Customs and Border Protection
for Modification of Palm Oil
Import Ban

Farm Robots Help Plug Worker
Shortage in Malaysian Palm Oil

Malaysia and China's 50-Year Palm Oil
Partnership: From Inception to Global
Impact

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PP18791/04/2016 (034458)



RM 10/USD 5

Cover Story

Interview with Dr. Sathia Varqa,
Senior Analyst Fastmarkets

(FORMER OWNER AND CO-FOUNDER OF PALM OIL ANALYTICS)



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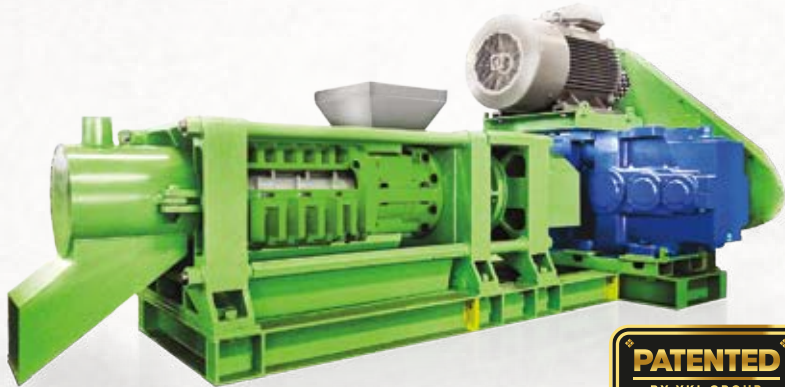
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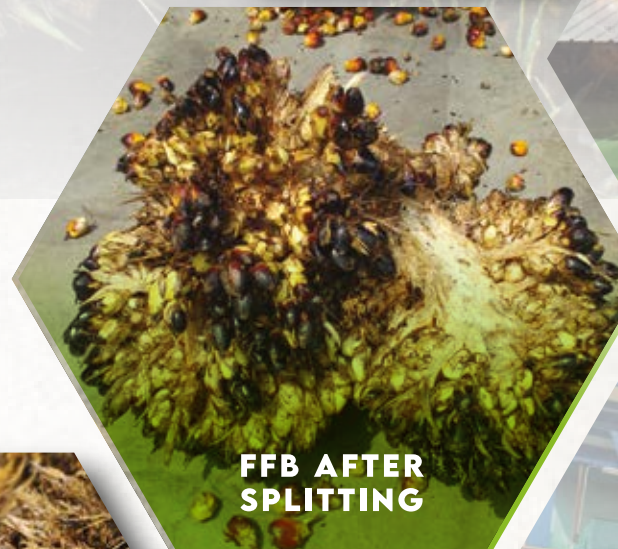
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The Ministry of Plantation and Commodities will gather cost-related data from all stakeholders in the palm oil industry before making any decisions regarding the windfall profit levy (WPL) on palm oil in the country. Plantation and Commodities Minister Datuk Seri Johari Abdul Ghani stated that all proposals concerning this issue will be submitted to the Ministry of Finance (MOF) before the presentation of Budget 2025.

On July 4, Johari stated that Malaysia risks losing its competitiveness compared to other producer countries if the WPL on palm oil is not revised. His ministry had previously investigated the WPL concerns raised by industry players and held consultations with relevant stakeholders. Currently, a WPL rate of 3% is applied to palm oil priced above RM3,000 per tonne in Peninsular Malaysia and above RM3,500 per tonne in Sabah and Sarawak.


The ministry's proactive approach in examining the issue and consulting with industry players and relevant parties is commendable. It suggests that the government is taking a holistic view, considering the feedback from those directly impacted by the levy. This inclusiveness is crucial for creating policies that are both fair and effective. Given the dynamic nature of the global palm oil market, periodic reviews and adjustments to these rates are necessary to ensure they remain appropriate and do not stifle the industry's growth.


Don't miss our upcoming event, Palm Oil Technology and Event EXPO (PALMEX), Malaysia 2024 that will be held at Hall 4 & 5, Kuala Lumpur Convention Centre, (KLCC), Kuala Lumpur from 28th to 29th August 2024. On behalf of the editorial team, thank you for your continuous support of Asia Palm Oil Magazine. Stay in touch with us at www.asia-palmoil.com and follow us on Facebook and LinkedIn for more updates



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DISTRIBUTED BY

Central Paper Agencies Sdn Bhd (111330-T)
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Tel: (+603) 5636 1278 / 5636 1358 Fax: (+603) 5636 1952
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PRINTED BY

MMS PRINT SHOP (M) SDN. BHD. (1246387-v)
NO 43G, Jalan PBS 14/2, Taman Perindustrian Bukit Serdang, 43300 Seri Kembangan, Selangor.

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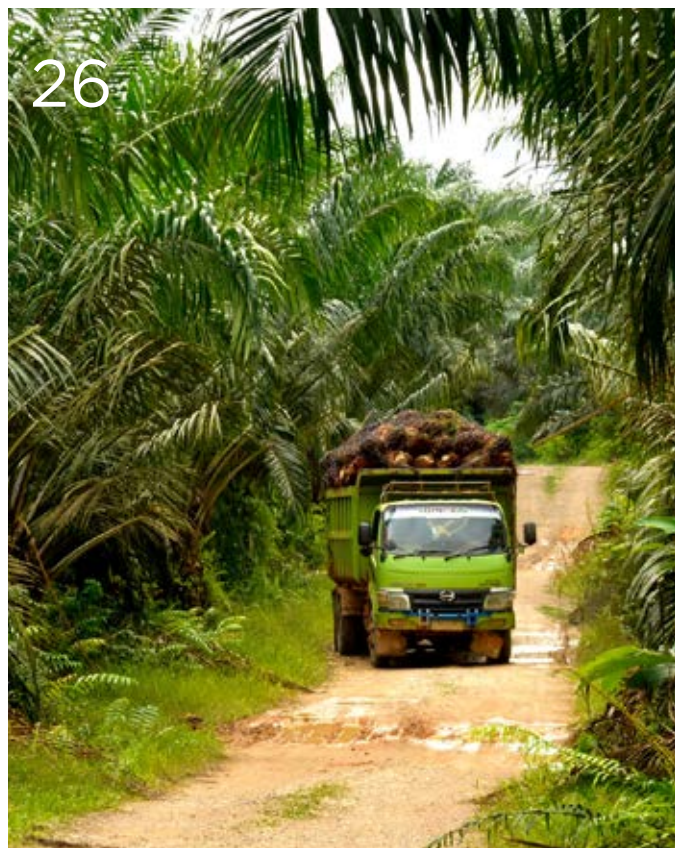
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MPOB Unveils Latest Innovations in Palm Oil Industry



The Malaysian Palm Oil Board (MPOB) has introduced six new technologies and one service at its annual transfer of technology (TOT) programme today, showcasing the latest innovations in the palm oil industry.

The event was officiated by Plantation and Commodities Minister Datuk Seri Johari Abdul Ghani.

He acknowledged that every year, a group of MPOB members would produce many research and development (R&D) products.

Johari emphasized the importance of these innovations in diversifying the palm oil market beyond food applications.

“Among the technologies presented, two have already secured commercialization agreements with private companies,” he said.

The six new technologies include the new crop variety Series 4 Oil Palm Clones (CPS 4) and the Grass Cutting Machine with Hydrostatic Transmission and Radio Control.

In addition, it also includes Industrial grade cleaning liquid, palm-based adhesive for pest control, and a palm-based transformer oil.

One of the highlighted innovations is a palm oil-based food-grade grease.

“We used to always use petroleum-based grease but now we use palm oil, called bio grease. This is one of the innovations we have made,” he added.

Johari emphasized the critical role of R&D in the palm oil industry, noting that palm oil cultivation is the largest commodity in Malaysia, covering 5.7 million hectares and exporting approximately 15 million tonnes.

He also highlighted the importance of commercializing these innovations.

The MPOB’s approach involves collaborating with industry players to further refine and market new technologies, which Johari said the Plantation and Commodities Ministry will assist with.

“Any feedback that we get, we will revert back to MPOB for further refinement if new R&D is needed,” he explained.

By developing new products and applications, MPOB aims to expand the industry’s reach and maintain its position as the world’s second-largest palm oil producer.

Johari reiterated the importance of continued investment in R&D and commercialization to ensure the industry’s long-term sustainability and competitiveness in the face of global challenges.

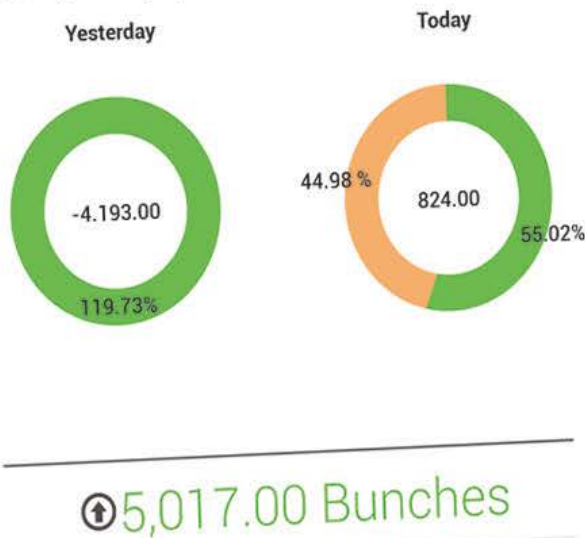




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JPG to Benefit from Higher Palm Oil Prices



Main-market bound Johor Plantations Group Bhd (JPG) is expected to see strong earnings growth this year on higher palm oil prices and fresh fruit bunch production and lower production costs.

However, the net integrated plantation company's net profit will likely decrease in the financial year ending Dec 31, 2025 (FY25) due to lower palm oil prices and lower production volume growth amid its aggressive replanting programme, according to TA Research.

The research house ascribed a fair value of RM1.06 for JPG's shares based on 14 times the estimated price-earnings ratio (PER) for FY25, a 20% discount to its sector target PER of 18 times.

"We believe the discount is justifiable due to JPG's considerable debt obligations and the substantial capital expenditure needed for its replanting programme," the research house explained.

JPG is expected to be listed on July 9 with an initial public offering price of 84 sen per share to raise an estimated RM735mil.

Some 50.5% of the total proceeds to be raised from the public issue has been earmarked for the construction of an integrated sustainable palm oil complex and replanting, 43% will be channeled towards the repayment of bank borrowings, 1.7% will be for working capital, and the remainder for listing expenses.

TA Research estimated a net profit of RM204.6mil, up 24.6% year-on-year, for JPG for FY24.



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Ecoscience Bags RM61.8mil Palm Oil Plant Construction Job

Ecoscience International Bhd (EIB) has accepted a letter of award from Oiltek Sdn Bhd (OSB) worth RM61.8mil for the construction of a crude palm oil (CPO) pretreatment plant and a plant, machinery and equipment (PME) plant in Port Dickson, Negeri Sembilan.

In a filing with Bursa Malaysia, the integrated palm oil milling services provider said the contract entails undertaking the engineering, procurement, construction and commissioning of civil and structural works of 420 tonnes per day for the CPO pretreatment plant and 400 tonnes per day for the PME plant.

The award was accepted by EIB's wholly-owned subsidiary, Ecoscience Manufacturing and Engineering Sdn Bhd (EMESB).

Under the contract, EMESB will be required to provide a performance bond, which is equivalent to 10% of the contract amount before the release of the down payment, which must remain valid until the warranty bond is posted.

“The contract completion date for the works shall be the date on the 534th day from the letter of award date,” said EIB.

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FGV Submits Petition to US Customs and Border Protection for Modification of Palm Oil Import Ban

FGV Holdings Berhad (FGV) announced that it has submitted a petition to the United States Customs and Border Protection (CBP) seeking the modification of the Withhold Release Order (WRO) imposed on its palm oil and palm oil products since September 2020.

The submission, made on June 30, 2024, follows significant remediation efforts by FGV to ensure full enjoyment of labor rights and improve the welfare of workers across its operations, according to national news agency Bernama.

FGV appointed LRQA (formerly known as Elevate) as an independent third-party to assess its palm oil operations against relevant labor standards, particularly the International Labor Organization (ILO) Indicators of Forced Labor.

The company also engaged Crowell & Moring as legal counsel to advise on requirements stipulated by US and international law to address the WRO.

In its efforts to address the WRO, FGV implemented a comprehensive remediation plan aimed at closing identified gaps in its labor practices and aligning its operations with internationally recognized ethical labor standards, Bernama reported.



The submission, made on June 30, 2024, follows significant remediation efforts by FGV to ensure full enjoyment of labor rights and improve the welfare of workers across its operations, according to national news agency Bernama. - Picture courtesy of FGV

A key component of this plan involved reimbursing recruitment fees to migrant workers, with FGV allocating RM112 million for this purpose and spending RM85.29 million to reimburse 22,600 workers to date.

The remediation plan includes:

- strengthening of FGV’s procedures for the recruitment of migrant workers in line with ethical recruitment principles and standards, evidenced by enhancing due diligence measures in the appointment of recruitment agencies.
- enhancing infrastructure and housing facilities. During the time frame 2018-2023, a total of RM487 million was spent to upgrade and construct new housing as well as enhancing internet connection in remote areas. An additional RM605 million is further allocated for 2024-2026 to further enhance the infrastructures and housing facilities for workers. This also includes enhancing workers’ access to internet connection at estates in remote areas by installing internet satellite facilities.

- strengthening FGV’s grievance mechanism by updating its grievance policies and procedures, establishing a Grievance Management Committee and rolling out a third-party grievance channel, Suara Kami, that is accessible to all workers across FGV’s estates and mills.

- promoting workers’ right to freedom of association and facilitating the enjoyment of the right to join unions through collaboration with the National Union of Plantation Workers (NUPW).

FGV’s submission to CBP underscores its commitment to addressing the 11 ILO Indicators of Forced Labor. The company expressed hope that the improvements and enhancements to its labor practices will lead to the modification of the WRO.

Source: www.malaymail.com

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Farm Robots Help Plug Worker Shortage in Malaysian Palm Oil

A drone buzzes between trees on a humid Malaysian morning, monitoring the oil palm fruits as they ripen. Self-driving trucks rumble over the vast plantation's uneven ground, laying fertilizer and picking up the densely packed harvested bunches.

These are just some of the robots the Southeast Asian nation's top palm growers hope will take over the sector's most difficult and dirty jobs, plugging chronic worker shortages that have disrupted supplies of the world's most-consumed edible oil.

With global stockpiles set for the first back-to-back decline in more than 40 years, Malaysia has every reason to push for automation to boost production. Increased awareness of the industry's problematic reliance on migrant workers – clouded by restrictions and labor abuses – has also encouraged companies to find alternative solutions, said Mohamad Helmy Othman Basha, group managing director of SD Guthrie Bhd., a government-linked company previously known as Sime Darby Plantation.

“To depend on foreign workers for all these key tasks is actually putting this industry at a very high risk,” Helmy said. “This is why we have to take this plunge. We really have to place these bets.”

Perfecting the robots and deploying them at a commercially viable scale will take years, even as firms pour millions into developing such technology and retraining their staff to use it. But producers are pressing ahead.

The plantation workforce in Malaysia – the world's No. 2 palm oil producer – was hollowed out during the pandemic, when border restrictions meant companies couldn't bring in the foreign workers they so heavily rely on. It was the country's worst-ever worker shortage and palm oil production plummeted, pushing prices to record highs. The industry lost billions.

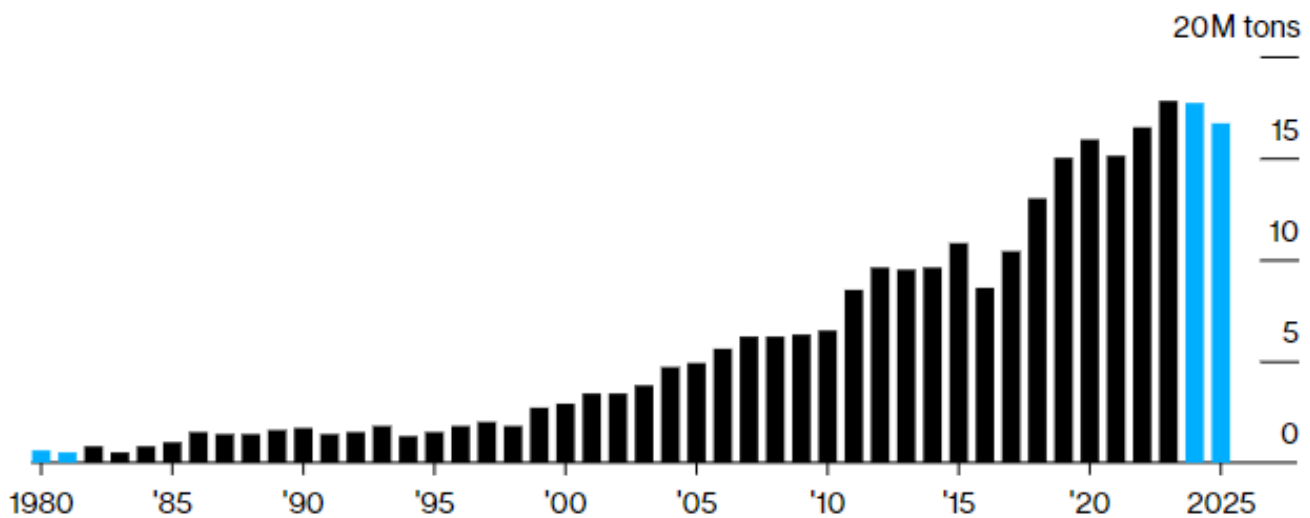
SD Guthrie learned its lesson. Where possible, the firm has started using machines to take over non-harvesting jobs like



An autonomous mechanical buffalo grabber at the SD Guthrie palm oil plantations in Selangor. (Photo: Samsul Said/Bloomberg) (Bloomberg)

Palm Oil Stockpiles Face First Consecutive Drop Since 80s

Global output falters as worker shortages hurt Malaysian yields



Bloomberg

spraying pesticide or monitoring fruit and yields. Where the industry average is currently for one worker to maintain 8-10 hectares of land, the company wants to boost that to about 17 hectares per worker with the aid of automation.

The company's investment into robots is set to reach 100 million ringgit (\$21.2 million) – or about half its research and development budget – by year-end and it “will spend whatever is required to find a solution,” according to Helmy. Nearly 30% of its annual R&D budget will be spent on this initiative in the next three to four years.



An aerial drone flying at the palm oil plantations in Selangor. (Photo: Samsul Said/Bloomberg) (Bloomberg)

The robots aren't fully autonomous yet, meaning there is still a need for skilled workers to control and maneuver them. Plus, trickier tasks remain in the hands of humans – like safely cutting down ripe fruit bunches from trees that can be as tall as six-story buildings.

But the technological advances have already opened up an avenue for women to join a traditionally male-dominated workforce. Sri Norhidayu Kussain, a 41-year-old woman, says the robots help with backbreaking tasks like lifting 30-kilogram (66-pound) fruit bunches and loading them into trucks.

“The work is now easier because these machines have successfully reduced the need for physical labor. It's no longer like before when only men could do these types of jobs,” said Norhidayu, who operates a pesticide-spraying vehicle that can do the job of six workers at SD Guthrie's Sungai Linau estate in Malaysia's central state of Selangor.

Women make up 3% of the company's roughly 700 machine operators and Helmy says the company is trying to attract more.

Labor shortfalls have long been a headache for Malaysian businesses, partially because of strict immigration rules targeting low-skilled workers that in turn have encouraged trafficking and left thousands of undocumented workers without legal protection. International scrutiny of labor abuses has pushed the country to reduce its reliance across several industries including manufacturing, construction and plantations.



A worker controls a fertilizer spreader at the SD Guthrie palm oil plantations. (Photo: Samsul Said/Bloomberg) (Photographer: Samsul Said/Bloomberg)

SD Guthrie itself faced allegations of forced labor that resulted in a two-year US ban on imports of its products in 2020 – something that Helmy said urged the firm to explore automation.

“Automation, if rolled out strategically will not hurt workers’ livelihoods,” said Adrian Pereira, executive director at the North South Initiative, a Malaysia-based non-governmental organization focused on social justice. “We really hope government-linked companies will take the lead and demonstrate that this sector can be free of forced labor soon.”

SD Guthrie is the first plantation company in the country to set up a research facility dedicated to developing robots. Other palm giants like Golden Agri-Resources Ltd. and IOI Corp Bhd. have also invested in mechanization and artificial intelligence to help harvest the oil used in everything from chocolate to soaps and fuel.

A plantation run entirely by robots will not be a reality soon. Technical issues like getting the robots to self-navigate through hilly terrain or correctly identify ripe fruit bunches, have held back past automation initiatives. This is in stark contrast to crops like soybeans or rapeseed – waist-high row crops grown on flat fields – where farmers can tend to hundreds of hectares with tractors and giant harvesting machines.

But speaking amid whirring and beeping prototypes at the company’s robotics lab in Selangor, the firm’s Chief Digital Officer Aditya Tuli said change was here to stay.

“Once we start mechanizing, we do imagine that there will be an increase or a positive impact to production numbers,” he said. “We are chasing that.”

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Sabah to Produce Tocotrienols from Palm Oil By-Product

Malaysia's first facility utilizing refined palm oil by-products to produce tocotrienols is under construction in Kunak.

The plant is dedicated to refining and producing tocotrienols, marking a significant milestone in Sabah's downstream palm oil industry.

It is owned by Kunak Refinery Sdn Bhd, a subsidiary of Sawit Kinabalu, which is linked to the Sabah state government's investment in the palm oil industry.

Industrial Development and Entrepreneurship Datuk Phoong Jin Zhe recently inspected the construction of the plant.

Phoong and his delegation also toured an operational palm oil refinery.

Tocotrienols, a form of Super Vitamin E known for their potent antioxidant properties, are highly sought after by cosmetics manufacturers and supplement producers. These compounds are renowned for their health and therapeutic benefits, including combating cholesterol, cancer, stroke and aging.



Phoong revealed that the construction of the plant is currently 60% complete and is expected to be finished by mid-2025.

He emphasized that the Sabah government has always been committed to developing the downstream palm oil industry, rather than merely exporting crude oil and raw products.

This aligns with Sawit Kinabalu Group's vision to enhance the palm oil industry chain from upstream palm trees to downstream products like vitamin supplements. Industrialization is essential for Sabah to achieve prosperity.





Kunak Refinery Sdn Bhd management introduce Sayang cooking oil which produced by the company to Phoong.

“The downstream industry of tocotrienols presents a significant opportunity for Sabah. By transforming refined palm oil by-products into high-value products, we will have excellent export conditions in the future.

Source: theborneopost.com

Especially since last year, under the promotion of Deputy Prime Minister II Datuk Seri Fadillah Yusof, China approved the import and application of tocotrienols, highlighting the enormous potential for Sabah’s industrial development,” said Phoong.

Additionally, Phoong disclosed that last month, the Deputy Minister of Plantation and Commodities and Member of Parliament for Kota Kinabalu, Datuk Chan Foong Hin, witnessed the signing of a memorandum of understanding between Kunak Lipids Sdn Bhd and Shanghai Boce Trade Service Company.

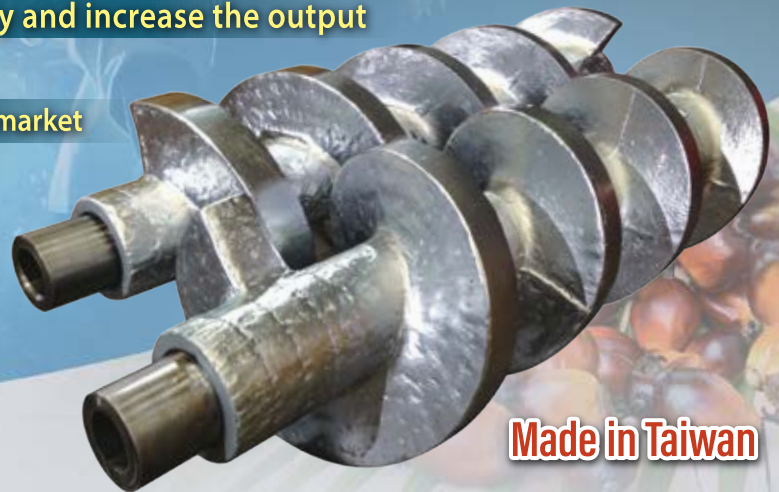
This collaboration aims to produce refined palm oil by-products to meet the demand of the Chinese market.

Under Chan’s witness, the Sawit Kinabalu team also engaged with potential distributors and manufacturers who showed great interest in tocotrienols and other phytonutrients extracted from palm oil, particularly cosmetics manufacturers.

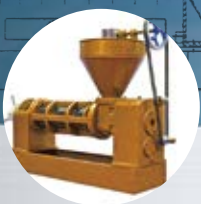
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Msia's Palm Oil Stocks Hit 4-Month High in June on Weak Exports

Palm oil exports plunge 12.82% from May 2024 to 1.21 million tons.



Malaysia's palm oil stocks at the end of June increased by 4.35% from May to 1.83 million metric tons, the highest since February.

Malaysia's palm oil stocks surged to a four-month high in June, driven by a steeper decline in exports compared to production, said the industry regulator.

"The rise in stocks in Malaysia, the world's second-largest palm oil producer after Indonesia, would put pressure on benchmark futures, which fell more than 4% in two days.

"Malaysia's palm oil stocks at the end of June rose 4.35% from May to 1.83 million metric tons, the highest since February," said the Malaysian Palm Oil Board (MPOB).

Crude palm oil production declined 5.23% from May to 1.62 million tons, while palm oil exports plunged 12.82% to 1.21 million tons.

Meanwhile, a Reuters survey forecasted inventories at 1.83 million tons, with output at 1.62 million tons and exports at 1.24 million tons.

"Stocks rose as expected, but the buildup is concerning.

"Palm oil inventories are increasing even before the peak production season begins in August," said a New Delhi-based dealer with a global trade house.

The dealer said the discount of palm oil to soy oil and sunflower oil is small and needs to widen to stimulate demand.

"Otherwise, traditional buyers may shift to competing oils," said the dealer.

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Plantation Ministry Will Propose Channeling Windfall Tax to Replanting under Budget 2025 – Johari



The Ministry of Plantation and Commodities will propose under Budget 2025 to channel a portion of the existing windfall tax on the palm industry to levy-paying planters for replanting.

The current windfall levy formula is impractical due to the sharp rise in costs, Plantation and Commodities Minister Datuk Seri Johari Abdul Ghani acknowledged. One of the ministry's priorities is to review the windfall levy, he said.

"The cost used to be RM1,800 to produce one ton of palm oil; now it has gone up to RM2,800-RM3,000, depending on the plantation size. Therefore, the windfall levy formula is no longer suitable," Johari told the Dewan Rakyat during the oral question-and-answer session.

Malaysia currently imposes a windfall levy of 3% when palm oil prices top RM3,000 per ton in Peninsular Malaysia and when prices go higher than RM3,500 per ton in Sabah and Sarawak.

Planters in Malaysia, the world's second-largest producer of the edible oil used in everything from lipstick to diesel, have been calling on the government to review the tax regime for years. In addition, Malaysia has a multi-tier tax rate of between 4.5% and 8.5% for exports of crude palm oil that kicks in when prices exceed RM2,250 per ton.



Johari said the ministry will discuss the windfall levy with the Malaysian Palm Oil Board and bring the matter to the Ministry of Finance.

Replanting in focus to boost yield

Meanwhile, Johari said Malaysia's palm oil production stood at 18.5 million tonnes in 2023, which is relatively low compared to Indonesia's production of 48 million tonnes.

He said several factors contributed to the lower production of palm oil compared to Indonesia, including the need to comply with good land-use practices to avoid deforestation and climate change.

"We do not clear new land for oil palm plantations, instead we focus on production," Johari said.

Of the 5.7 million hectares of land under oil palm plantation in the country, 4.2 million is owned by the private sector, and the remaining 1.5 million is managed by smallholders, he noted.

Source: theedgemaalaysia.com

However, the yield from the 1.5 million hectares managed by smallholders has decreased over the years as the oil palms age, and the smallholders lack the capital for replanting, Johari said.

Replanting should occur at a rate of 4% to 5% annually based on industry best practices, but the annual replanting rate remained low at 1.8% between 2014 and 2023, he said.


To ease the burden on smallholders, Johari said the government is launching a new consolidation scheme to optimally manage smallholder oil palm plantations by combining them into larger, commercially viable estates on top of the RM100 million incentives for replanting under Budget 2024.

"This will ensure effective worker management, replanting, and the use of high-quality seeds and fertilizers for long-term sustainability," Johari added.



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Malaysia and China's 50-Year Palm Oil Partnership: From Inception to Global Impact

As 2024 marks five decades of diplomatic relations between Putrajaya and Beijing, it's noteworthy that Malaysia holds the distinction of being China's inaugural palm oil exporter, a milestone achieved in the mid-1980s.

From seeds of friendship, these two Asian nations have established and sustained fruitful business rapport, expanding beyond crude palm oil exports to encompass strategic collaborations in downstream processing, with sustainability at its core.

The commemoration of Malaysia and China's 50th anniversary follows the historic Joint Communiqué signed by Second Prime Minister Tun Abdul Razak Hussein and His Excellency Chou En Lai on May 31, 1974.

Why China a key market for Malaysia?

Malaysian Palm Oil Council (MPOC) chief executive officer Belvinder Sron said with a population of 1.4 billion, China is undeniably an important market for Malaysia.

It generates significant demand for oils and fats, amounting to about 42.0 million tonnes annually, with 25 per cent to 30 per cent of this demand being met through imports.

"The growing demand and production deficit present substantial opportunities for Malaysia. The close geographical proximity between the two nations further enhances Malaysia's role in bridging any supply-demand gaps, particularly during periods when geopolitical factors disrupt the supply chain," she told Bernama.

Belvinder said that despite a recent slowdown in the Chinese economy, China's status as the world's second-largest economy ensures a consistent and growing demand for palm oil.

Additionally, limited arable land and an expanding economy indicate that China is likely to increase its imports of vegetable oils, including palm oil.

The International Monetary Fund projected China's economy to grow by five per cent this year and 4.5 per cent in 2025.

Sharing some data, Belvinder mentioned that in 2023, Malaysia exported 3.05 million tonnes of palm products to China, primarily consisting of palm oil and oleochemicals.

These two categories, she said, were the major components, accounting for 48 per cent and 20 per cent of the total exports, respectively.

Other products, including palm kernel oil, also contributed to the export portfolio.

The primary palm oil fractions exported from Malaysia to China were refined bleached deodorized (RBD) palm olein and RBD palm stearin, constituting 50 per cent and 38 per cent of palm oil exports in 2023.

RBD palm olein is primarily used in China for frying instant noodles, as cooking oil in food processing and catering and in food manufacturing, while RBD palm stearin serves as a feedstock for producing various oleochemicals.

Meanwhile, Belvinder noted that palm kernel cake has gained popularity in China as an alternative feedstock for animal feed production, reducing reliance on imported soybean meal.

Strengthening ties

Since the 1990s, the MPOC has actively engaged with Chinese stakeholders through government-to-government and business-to-business initiatives, showcasing palm oil's versatility and health benefits.

Seminars, summits and forums have facilitated direct interaction between Malaysian suppliers and Chinese counterparts, fostering new business relationships and enhancing existing ones.

“The MPOC established a representative office in Shanghai in 2002 to better manage these activities and serve as a focal point for the Chinese industry.





“This office plays a crucial role in organizing marketing initiatives, gathering market intelligence on import demands and policy changes, and working closely with Chinese importers to meet their demand for sustainable palm oil in both the food and non-food sectors,” Belvinder said.

China’s sustainable development goals

Belvinder said China is actively progressing towards sustainability, although specific regulations for sustainable palm oil have not yet been introduced.

The country’s 14th Five-Year Plan (2021-2025) emphasizes a green transformation in economic and social development, highlighting green consumption as a key element in building a green economy.

“While formal policies mandating sustainable palm oil are still under development, some major Chinese food processors have already begun using sustainable palm oil.

“This shift is part of their strategy to contribute to sustainable development and to align with global sustainability goals. As the process continues, more companies are expected to incorporate sustainable palm oil into their operations,” she said.

Belvinder noted the growing importance of Malaysia’s Sustainable Palm Oil (MSPO) certification, which upholds environmental and social responsibilities, suggesting it could play a crucial role in meeting China’s increasing demand for sustainable products.

Forging a fruitful future

As China’s market grows more sophisticated and its consumers increasingly health-conscious, MPOC anticipates a shift from conventional palm oil products like RBD palm olein and palm stearin to higher-value alternatives such as carotene-rich red palm oil, specialty fats, and hydrotreated vegetable oil, meeting new demand trends.

Further collaboration in research and product development is expected, potentially through joint ventures in Malaysia or China.



Malaysian Palm Oil Council (MPOC) chief executive officer Belvinder Sron said with a population of 1.4 billion, China is undeniably an important market for Malaysia. - Picture by Ahmad Zamzahur

“This partnership will extend beyond food and non-food sectors to include bioenergy, notably in sustainable aviation fuel, where Malaysia aims to become a key supplier. These developments are set to elevate the relationship between the two nations in the palm oil sector in the coming decades.

“For MPOC, we will continue to adopt various approaches to promote palm oil in China, engaging with industry stakeholders, health experts and government agencies to highlight its benefits and versatility.

“We believe these collaborative efforts will enhance understanding and acceptance of palm oil across different sectors of the Chinese market,” she said.

Belvinder emphasized that due to China’s limited arable land, the country would continue to face a shortage of locally produced vegetable oils, making it a net importer for the foreseeable future.



“As the most versatile and widely produced vegetable oil globally, the demand for palm oil in China is likely to grow. Thus, China will persist as an important market for the Malaysian palm oil industry,” she added.

Source: www.malaymail.com

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Malaysia Set to Sign Trade Agreement with China for Palm Oil and Agricultural Commodities

The Malaysian government is set to sign a trade agreement with China for palm oil and agricultural commodities later this year, the country's deputy Plantation and Commodities minister Chan Foong Hin as saying.

The memorandum of understanding (MoU) would also be a milestone to mark 50 years of diplomatic relations between Malaysia and China, Hin was quoted as saying in the 10 June report.

"With our collaborative efforts, palm oil trade will deepen and continue to reach new historic highs," he said, adding that increasing exports of palm oil products to China was part of the ministry's new direction.

China had been Malaysia's largest trading partner for 15 consecutive years, he said.

"In 2023, Malaysia exported RM192.2bn (US\$40.8bn) worth of goods to China, with agricultural commodity exports accounting for over RM20bn (US\$4.2bn)," Hin said.

"Exports of palm oil and its products take the largest share ... at RM11.03bn (US\$2.3bn), followed by rubber (RM5.43bn/US\$1.15bn), timber (RM2.83bn/(US\$601M), cocoa (RM684M/US\$145M), tobacco (RM18.43M/US\$3.9M) and pepper (RM11.88M/US\$2.4M)."

Although Hin said he had received many requests about expanding palm oil exports to China, Malaysia's production had stagnated at about 18M tons/year of crude palm oil.

Of the 18M tons, 3M tons had been allocated for domestic consumption, while the remainder was exported to China and other global buyers.

"The real question is how we can maximize the value of those 18M tons," he said.

Palm oil production in Malaysia is limited as the country has capped the number of oil palm plantations at 6.5M ha to preserve primary forest cover.





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State to Probe Oil Palm Price Dip in South



The Commerce Ministry has ordered the Internal Trade Department to visit provinces with palm plantations as oil palm prices fell to find the cause and suggest preventive measures.

Commerce Minister Phumtham Wechayachai told Wattanasak Sur-iam, director-general of the Internal Trade Department, to visit the southern provinces of Phangnga, Krabi and Surat Thani to evaluate the cause of the decline in oil palm prices following complaints by growers of the reduced purchase prices.

Mr Wattanasak said the local price of domestic fresh palm nuts plunged from 4.98 baht per kilogramme to 4.60-baht last week because of oversupply from April to May. In addition to a glut, the nuts are low quality because of the extremely hot weather, meaning they did not naturally ripen,

Mr Wattanasak said the prices of local fresh palm nuts are expected to recover after farmers were asked to delay their harvest and cut only palm nuts that are fully ripened to fetch good prices.

The department instructed palm nut buyers and palm oil production plants to continue purchasing as usual, and to refrain from making palm nuts fall unnaturally. Offenders could face a prison term of up to five years, a fine of 100,000 baht, or both, according to the Price of Goods and Services Act of 1999.

The department also ordered officials to inspect the purchases and the accuracy of the scales at dumping yards, as well as palm oil plants to prevent the exploitation of farmers.



Mr Wattanasak said the prices of local fresh palm nuts are expected to recover after asking farmers to delay their harvest and cut only palm nuts which are fully ripened to fetch good prices. (File photo)

Fresh palm nut production is estimated at 18.1 million tons this year, down from 18.3 million the year before. Of the total supply, about 3 million tons is for crude palm oil production, comprising 1.3 million tons for domestic consumption, 1.08 million tons for biodiesel production, and 800,000 tons for export. Thailand has crude palm oil stocks of 200,000 tons.

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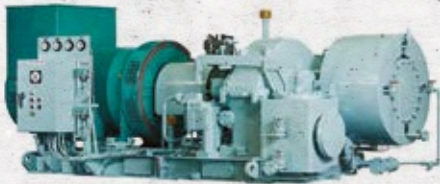
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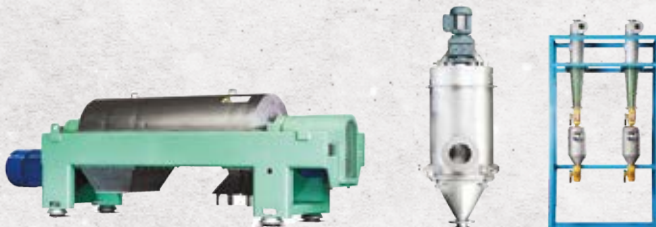
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Apical Doubles Palm Oil Refining Capacity in West Sumatra, Indonesia

Apical, a leading vegetable oil processor, held a groundbreaking ceremony today at its PT Padang Raya Cakrawala (PRC) facility to mark the construction of a new crude palm oil (CPO) refinery and fractionation plant for cooking oil production. Located in Padang City, West Sumatra, Indonesia, these new plants are set to boost Apical's production capacity to meet growing demands of both domestic and international markets.

The new plants, scheduled to be completed by 2025, was officiated by the Governor of West Sumatra, Mahyeldi Ansharullah, with Apical's Director of Social, Security and License, Gunawan Sumargo, in attendance. This expansion represents a major milestone for both Apical and the region. The refinery will have the capacity to process up to 3,500 metric tonnes (MT) of CPO per day, while the cooking oil fractionation plant will have a capacity of 3,000 MT per day.

"We applaud Apical for its investments in Padang. We hope this move will open up more employment opportunities for the community, especially in West Sumatra, while also guaranteeing a stable supply of cooking oil in the region," said Mahyeldi.



Gunawan further elaborated on the progress of PT PRC's expansion, "The addition of the new plants marks the beginning of the third stage of our expansion plan which started in 2019. With these new additions, our combined CPO refining capacity at PT PRC will increase to 7,000 MT per day while the capacity for cooking oil fractionation plant will increase to 5,900 MT per day."

Apical's decision to add a cooking oil fractionation plant underscores its commitment to growing its downstream business segment, aligning with the Government of the Republic of Indonesia's agenda of promoting the down streaming of palm oil. This move solidifies Apical's role as a critical player in supporting the country's focus on the palm oil industry.

PT PRC, the largest palm oil refinery in Padang, is a multi-product refinery capable of producing palm olein, stearin, biodiesel and fatty acid. Currently, the refinery has a refining capacity of 1.2 million MT per annum, which will double to 2.4 million MT upon completion of its expansion. Strategically located in West Sumatra, this expanded facility will cater to demands in Indonesia and serves markets in the Middle East, Africa, and the Indian subcontinent region.



Source: www.malaymail.com

About Apical

Apical is a leading vegetable oil processor with an expanding global footprint. Our vertically integrated mid-stream refining and value-added downstream processing makes us an integral supplier that supports the needs of various industries namely food, feed, oleochemicals and renewable fuel, including sustainable aviation fuel (SAF) which enables a great reduction of CO₂ emissions.

With integrated assets in strategic locations spanning Indonesia, China and Spain, Apical operates numerous refineries, oleochemical plants, renewable fuel plants and kernel crushing plants. Through joint ventures and strategic partnerships, Apical also has processing and distribution operations in Brazil, India, Pakistan, Philippines, Middle East, Africa, USA and Vietnam.

Apical's growth is built on the foundations of sustainability and transparency, and motivated by our strong belief that we can contribute to a circular economy for a more meaningful impact, even as we continue to grow our business and deliver innovative solutions to our customers.

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UK Delegation Learns about Sustainable Practices in Malaysian Palm Oil Sector

The Malaysian Palm Oil Council (MPOC) hosted a delegation from the United Kingdom, to showcase the industry's sustainable practices and socio-economic contributions.

Aimed at promoting the use of Malaysian Sustainable Palm Oil (MSPO) standards, the council teamed up with Kuala Lumpur-based social enterprise Wild Asia to organize visits to three smallholder plantations and Genting TrusHidup Oil Mill in Sandakan, Sabah.

To display Malaysia's commitment to wildlife conservation, the delegation was taken to Sepilok Orangutan Rehabilitation Centre in Sandakan and Borneo Elephant Sanctuary in Kinabatangan.

Additionally, the visitors also toured SD Guthrie's Palm Oil Experience Centre (POEC) in Carey Island and smallholder Felda plantations in Sungai Tengi Selatan, Kuala Kubu Baru.

The tour of these two Selangor locations aimed to give the visitors a view of both large-scale and smallholder palm oil operations.

The tour ended with a dialogue session organized by MPOC on the final day.

Ensuing discussions between the UK delegation and local palm oil stakeholders focused on MSPO standards.

MPOC chief executive officer Belvinder Sron pointed out that the UK was a highly promising market where palm oil is among the most consumed oils and fats.

In 2023, the UK imported 381,000 tons of palm oil, with Malaysia contributing 5% of these imports.

Tariffs on Malaysian palm oil imports into the UK will be eliminated once the UK's 2023 agreement to join the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) comes into force later this year.

This move is set to benefit UK industry and consumers.



One of several activities during the visit by UK palm oil stakeholders organized by MPOC.

"For Malaysia, we see the UK as a constructive partner in sustainability," Belvinder said.

"We are enthusiastic about improving sustainability practices related to deforestation, traceability, climate change and human rights through the features of MSPO 2.0.

"MPOC will continue to serve the Malaysian palm oil industry with more such programmes in high-value markets," she added.

The programme emphasized Malaysia's efforts to align with UN Sustainable Development Goals.



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Advancing Johor's Palm Oil Industry through Sustainability and Technology

In 2023, Johor Plantations Group Berhad (JPG), formerly known as Johor Plantations Berhad, emerged as a “new” name within Malaysia’s palm oil industry.

Through the years, JPG has evolved from modest beginnings to become a formidable force in the palm oil industry.

JPG was incorporated in 1978 as a private limited company and a subsidiary of Kulim (Malaysia) Berhad (Kulim), which is wholly owned by Johor Corporation (JCorp).

Over the years, Kulim’s focus shifted towards oil palm plantations and later, agribusiness.

It operates 23 oil palm estates (22 in Johor and one in Pahang) and five palm oil mills. All of JPG’s operation units are certified by Malaysian Sustainable Palm Oil (MSPO) and Roundtable on Sustainable Palm Oil (RSPO).

As of 13 May 2024, JPG had a total landbank of 59,781ha, of which 55,904ha (approximately 93.5%), was planted with oil palms.

All of its palm oil mills have biogas plant facilities and the one in Sedenak is equipped with a biomethane processing plant.

With an unrelenting focus on quality and sustainability, JPG believes it has a competitive advantage due to its track record as an RSPO-certified producer since 2009 and continued investment in crude palm oil (CPO) quality enhancement.

The sustainably-sourced CPO market consists of customers that have more stringent purchasing requirements, such as RSPO certification, complete traceability and lower levels of mineral and other contaminants in the CPO – all of which enable JPG to fetch a premium for its products in the market.



JPG will continuously reduce its reliance on manual labor by implementing advanced mechanization, automation, and digitalization in its plantation operations.



The enggang kelingking or hornbill is one of the unique species found in some of JPG's estates and adjacent forests. This symbolizes JPG's commitment to sustainability and the preservation of the environment. In 2022, Kulim completed its transformation as JCorp's agribusiness holding company by consolidating all plantation assets under JPG.

JPG recognizes the need to embrace digitalization as part of its transformation into a progressive, efficient, and profitable company.

It intends for digitalization to be at the core of operations going forward.

Commitment to ESG

JPG's commitment to Environmental, Social, and Governance (ESG) practices was solidified in 2004 when Kulim became a founding member of the RSPO.

In 2009, the company was one of the earliest Malaysian palm oil producers to be RSPO certified.

Nine years later, it declared its "No Deforestation, No New Development on Peat and No Exploitation (of human rights)" (NDPE) commitment under its sustainability policy.

JPG has designated 1,131ha within its estates as high conservation value areas and 276ha as conservation areas.

Given the importance of conservation in biodiversity hotspots, the company has developed a biodiversity policy that includes the creation of wildlife corridors to ensure the sustainability of indigenous species.

Substantiating its NDPE commitment, the company utilizes satellite imagery to provide the precise locations of its plantations as well as those of some smallholders.

JPG has also committed to reducing its carbon footprint by 50% by 2025 compared to its 2012 baseline and achieving net zero carbon emissions by 2050.

Among various low-carbon initiatives, JPG is deepening its commitment to renewable energy and developing this into a new business vertical.

Initially capturing biogas from mill effluents for use as fuel, JPG has also expanded the potential of using biogas by building a biomethane plant at the Sedenak palm oil mill. It started supplying the biomethane to Gas Malaysia Green Ventures Sdn Bhd (formerly known as Gas Malaysia Virtual Pipeline Sdn Bhd) in August 2023.

Collectively, these 'waste-to-wealth' initiatives bring JPG closer to achieving zero waste from its mill operations, something it has been working on for years.

Paving the way into agriculture's Industrial Revolution 4.0

A great deal of being sustainable rests on operating efficiently.

Towards this end, JPG continues to invest more into mechanization and digitalization of its production process to make way for better cost management and productivity, as well as reduced reliance on manual labor.

Estate operations are enhanced by an internally developed application, K-Plant, which provides real-time monitoring and reporting of various processes including sundry payments, check-rolls, nursery operations and harvesting.

Replacing manual in-field and mill tasks, it provides a shared information database for plantation operations management.

Digital solutions are also increasing operational efficiencies in JPG's palm oil mill operations.

These include digital weighing, automated control systems, computerized maintenance management systems, Fourier-transform infrared spectroscopy for quality inspection, digital draft control systems for smoke emissions, automated sludge dewatering systems for effluent treatment plants, digital sensors for ammonia level detection in water bodies, and real-time emissions update systems.

Social responsibility and community empowerment

As a truly responsible company, JPG's vision extends beyond self-transformation to encompass the transformation of its stakeholders and the entire oil palm industry.

The goal is to achieve greater efficiency, sustainability and profitability for all involved.

Committed to empowering local communities, it actively engages its smallholders to help them gain MSPO and RSPO certifications.

As a result of advisory and technical support provided through its smallholder inclusion programme, three out of its 29 external crop suppliers have been certified by RSPO.



It also supports the families of its smallholders and others living in or around its estates, particularly through the provision of education for the children.

In 2023, JPG incurred approximately RM1.2mil on various educational initiatives, firm in the belief that education is one of the most powerful tools to uplift communities in a way that is sustainable and meaningful.

Strategic rebranding and expansion

Following its rebranding, JPG is preparing to become a fully integrated palm oil player by extending its upstream operations into the downstream business.

In January 2024, it signed a shareholders' agreement with Japan-based Fuji Oil Asia Pte. Ltd. as its joint venture partner to develop an integrated sustainable palm oil complex comprising a downstream refinery, a palm oil mill, a kernel crushing plant, a bio-energy power plant, and an animal feed mill plant, powered by renewable energy, signifying a new phase of growth for JPG.

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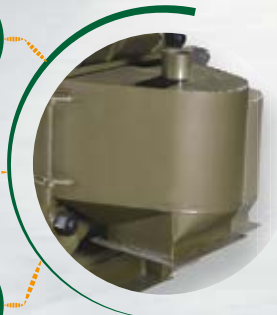
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Capacity :
6-8 Tons

Moisture Content :
40%-50%

OIL RECOVERY
ABOVE 0.3%



Why There's in Need for Modern Cleanroom Technology?

Efficiency

Modern cleanroom technology enhances operational efficiency by reducing cleaning time and effort, allowing businesses to maintain continuous production cycles and focus on core operations.

Consistency

With advanced cleanroom technology, consistent cleaning results are achievable, reducing the likelihood of contamination. This consistency is crucial for maintaining high standards of hygiene and safety, particularly in industries where contamination can have severe consequences. Consistent cleaning practices ensure that all areas of the cleanroom are maintained to the same high standard, reducing the risk of cross-contamination, and ensuring the reliability of the manufacturing process.

Product Quality

A clean environment maintained using advanced cleanroom technology ensures the highest product quality and integrity. By eliminating contaminants, we guarantee that our products meet the strictest quality standards, providing peace of mind to our clients. High product quality is essential in industries such as pharmaceuticals, biotechnology, and electronics, where even minor impurities can affect the performance and safety of the final product.



Regulatory Compliance

Our cleanroom technology ensures businesses meet GMP and HACCP regulatory requirements, ensuring confidence in audits. Outsourcing to a company with proven expertise ensures compliance, avoiding costly fines and disruptions. Our commitment to excellence and compliance is evident in industries requiring cleanrooms.

Specialized Facilities

Tissue Culture Lab: Our production laboratories are designed to facilitate efficient workflows across multiple operation areas. These include cleanroom facilities, specialized and environmentally controlled culture incubation rooms for different stages of tissue culture and clonal plantlet production, and nurseries for acclimatization, hardening, and establishment of clonal ramets before dispatch. These specialized facilities ensure that every stage of the tissue culture process is conducted in an optimal environment, enhancing the quality and yield of the final products.

Tempering Room and Cold Room: These facilities have a significant impact on the structural and application characteristics of products. Proper tempering techniques are essential for ensuring the stability and quality of finished goods. By controlling tempering temperatures, we can influence ductility, and hardness, and promote compound transitions,

among other benefits. The controlled environment of tempering and cold rooms is crucial for maintaining the integrity of sensitive products, ensuring they meet the required specifications.

Why Choose VC Group of Companies?

Modern Approach

Our modern cleanroom environments are designed using cutting-edge techniques, meeting current standards and anticipating future industry needs, providing clients with a competitive edge. Our deep understanding of tissue culture lab processes enables us to design precise systems that ensure efficient and effective operations. With our knowledge, we offer fully customized systems tailored to meet specific customer needs, ensuring optimal performance and efficiency. Modular construction and prefabricated components, utilizing DFMA principles, enable quick, efficient on-site installation, reducing project timelines and disruption. Our manufacturing plant provides cost, delivery, and time management advantages, allowing us to monitor product quality closely, ensuring high standards and confidence in product reliability and performance.

International Certifications

Our products have achieved numerous international certifications, including ISO9001, SIRIM, BOMBA, FM Approval, and CIBD certifications. These certifications reflect our professionalism and dedication to product quality and safety, allowing clients to choose our products with confidence. Achieving these certifications involves rigorous testing and quality control processes, demonstrating our commitment to maintaining the highest standards in the industry.



Extensive Experience

Since 2010, we have managed a variety of high-profile EPCM, EPCC, and Design & Build projects in Malaysia and China. Our team, with over 10 years of management and project experience, specializes in industrial high-technology applications, ensuring that every project is handled with expertise and precision. Our extensive experience allows us to tackle complex projects with confidence, delivering results that meet and exceed client expectations.

Building Information Modelling (BIM)

Building Information Modelling (BIM) is used in our projects to create detailed digital representations of buildings and infrastructure, enabling effective collaboration among engineers and construction professionals. This technology optimizes building performance, ensures quality and efficiency, and improves project visualization and planning, reducing costly changes.

Projects in Malaysia and Indonesia

Malaysia

Pulau Indah, Selangor: We designed and built the Clean Room Architectural, HVAC, Secondary Electrical System, and Control System for the CPKO Fractionation Filter Press Room. This project involved creating a controlled environment for the processing of palm oil, ensuring that the product met the highest quality standards.

Pasir Gudang, Johor: We designed and built the cGMP & HACCP Clean Room System, HVAC System, and provided Testing & Commissioning services for the Shortening Plant. Our work ensured that the plant could operate efficiently and meet the stringent requirements of the food industry.

Kuching, Sarawak: Tissue Culture lab

We designed, supplied, installed, and tested a Tissue Culture Lab.

Indonesia

Sampit, Indonesia: We designed, supplied, installed, and tested a Class 100K Clean Room for a Tissue Culture Lab. This project involved creating a highly controlled environment for the cultivation of plant tissues, ensuring the highest standards of cleanliness and contamination control.



Cikarang, Indonesia: We provided design, supply, installation, and testing & commissioning services for a Class 100K Clean Room HVAC Retrofit for a Tissue Culture Lab. Our retrofit services improved the lab's existing HVAC system, enhancing its ability to maintain a clean environment.

Serang, Indonesia: We designed, built, and tested an Air Conditioning Room with architectural works, HVAC system, a secondary electrical system, and a control system for the CPKO & Fractionation Palm Oil Process. This project involved creating a controlled environment for the processing of palm oil, ensuring that the product met the highest quality standards.

Medan, Indonesia: To design, fabricate, and supply installation works for cold room set up & chiller plant (palm oil).



Conclusion

The VC Group of Companies, a leader in the cleanroom industry, boasts modern approaches, international certification, and successful projects in Malaysia and Indonesia. Trust in VC Engineering and Maytech for quality, reliability, and controlled environments for operation. The VC Group of Companies is a leading cleanroom company known for innovation and excellence. We are prioritizing quality, efficiency, and customer satisfaction, offering tailored solutions to help clients achieve their goals in the cleanroom industry.

In a rapidly evolving industry, staying ahead requires a commitment to continuous improvement and innovation. The VC Group of Companies is dedicated to this ethos, constantly seeking new ways to enhance our services and deliver value to our clients. Whether you need cleanroom design, construction, or maintenance services, you can trust us to provide solutions that exceed your expectations and set new standards for quality and performance.

As we look to the future, we remain committed to expanding our expertise and capabilities, ensuring that we continue to lead the industry in cleanroom technology and services. Our vision is to be the go-to provider for cleanroom solutions, recognized for our commitment to excellence, innovation, and customer satisfaction. Join us on this journey and experience the difference that the VC Group of Companies can make for your business.

The VC Group of Companies, comprising VC Engineering Sdn. Bhd and Maytech Cleanroom Manufacturing Sdn. Bhd boasts over a decade of experience in the cleanroom industry. Our unwavering commitment to excellence is reflected in our strict adherence to both local and international standards. We provide comprehensive, one-stop solutions encompassing engineering, supply, delivery, and installation, catering to a wide array of cleanroom needs.

VC Engineering specializes in Engineering, Procurement, Construction, and Commissioning (EPCC) services, ensuring every project is executed with precision and expertise. Maytech focuses on Clean Room Architectural and Equipment Solutions, delivering top-notch products and services to maintain optimal cleanroom conditions. Cleanroom technology, essential for industries handling sensitive materials, employs various techniques and equipment to create and sustain controlled environments with minimal contamination. For instance, tissue culture labs require a clean environment and temperature RH control to ensure the integrity of their operations. These technologies are critical in Good Manufacturing Practice (GMP) sectors, where even minor impurities can compromise product safety and efficacy.

TOTAL FACILITIES SOLUTIONS

VC Group of Companies provide total facilities solutions from engineering, procurement, construction, and commissioning services for CPKO, Fractionation, Critical Tempering Room and Cold Room, Texturizing Plant, and Tissue Culture Lab.

VC Group of Companies is professional engineering which has been experiencing more than 20 years and we also provide design and built project.

Our services wide offer in Malaysia, Indonesia, and Southeast Asia.

We fully comply to Local Authority Standard (such as BOMBA & SIRIM) & International Standard requirements (such as FDA, cGMP & HACCP).

VC Engineering Sdn Bhd (1148146-X)

Engineering, Procurement, Construction & Commissioning

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T +606 758 6118 **E** salesmarket@maytechcr.com **W** www.maytechcr.com



- CPKO (Crude Palm Oil Kernel)
- Fractionation
- Critical Tempering Room and Cold Room
- Texturizing Plant
- Tissue Culture Lab



Advancing Kernel Press Maintenance Practice:

A Technical Insight into the YTH-9.35 and YTH-9.18 Kernel Press Models



Introduction:

In the labor-intensive ecosystem of kernel-crushing plants (KCPs), where efficiency and precision reign supreme, technological innovations are the driving force behind progress. As engineers and plant managers navigate the laboriousness of KCP machinery, a thorough understanding of technical innovation becomes paramount. As technology evolves, so do the operation and maintenance practices associated with kernel presses. The notable models, the YTH-9.35 and YTH-9.18, have garnered attention for their advanced features to streamline KCP. In this article, we delve into the technical features of these models, highlighting their innovative design elements and the benefits they offer in advancing kernel press maintenance practices.

Technical Comparison with Market Common Standard:

The YTH-9.35 and YTH-9.18 kernel press models are distinguished by their innovative design features aimed at improving efficiency and ease of maintenance. To provide an in-depth examination of the YTH-9.35 and YTH-9.18 models, let's conduct a detailed technical comparison with common standard designs across critical parameters:

1. Shaft Design:

The YTH-9.35 model pioneers a revolutionary duo shaft design, a departure from the conventional single shaft of a common standard. This innovative design enables fast replacement of worm collars due to wear off and minimizes damage to the shaft

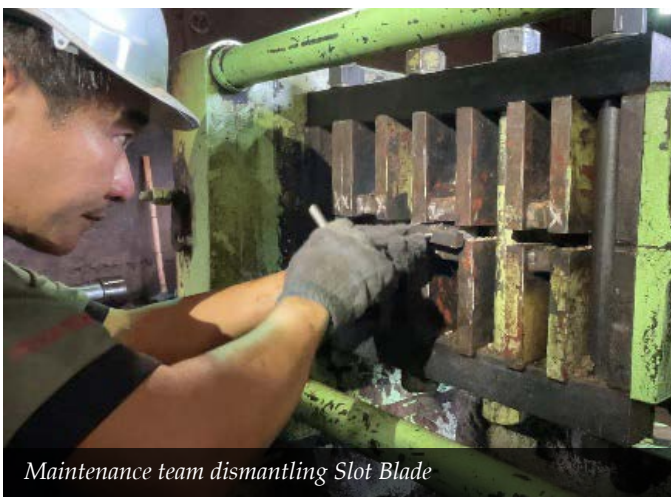


Patented Duo Shaft

if accidentally fed in of foreign metal with shaft bush feature, resulting in high productivity and low downtime with easy maintenance practices. This feature reduces OPEX associated with maintenance activities.

2. Body Cage Scraper/Spacer:

An often overlooked yet critical aspect, maintenance access significantly impacts operational downtime and efficiency. While the common standard offers limited and tedious access points to unbolt many parts before dismantling worm collars, the YTH-9.35 model boasts the easiest access point strategically positioned for effortless servicing of components. This minimizes downtime and empowers maintenance crews to perform tasks swiftly and efficiently.



Maintenance team dismantling Slot Blade

3. Ease of Maintenance:

Ease of maintenance is a cornerstone of operational excellence in KCPs. The YTH-9.35 model sets a new standard with its high degree of maintenance simplicity, contrasted against the common standard model in the market. By simplifying access to worm collars and enabling fast maintenance procedures, KCP can reduce the time required for routine press servicing.

Featuring impact-wrench-free maintenance and modular components, the YTH-9.35 model enables operators to execute routine maintenance tasks with unparalleled ease, reducing downtime and maximizing productivity, inducing harmonious maintenance practices.



Maintenance team working inside KCP, while dismantling shaft

4. Impact Wrench-Free Maintenance:

A standout feature of the YTH-9.35 model is its impact-wrench-free maintenance capability, a rarity in common standard designs. Unlike common brands in the market which may necessitate specialized tools for certain maintenance tasks, the YTH-9.35 model simplifies maintenance procedures, eliminating the need for additional equipment and expediting maintenance activities.

5. Modular Design:

Modularity is key to efficient maintenance and repair processes. The YTH-9.35 model incorporates easily accessible modular components that facilitate swift troubleshooting and replacement.

- Individual Removeable Slot Blades
- Duo Shaft comprises of Drive Shaft and Press Shaft
- Shaft bush enabling most minimal damage to Press Shaft
- Lockable Cone Point Features to enable stable pressing ampere
- Duo-Oil Pan of Machine Base Frame to prevent contamination of lubrication oil to CPKO
- Clamping bar cage adaptable to Every Machine Housing and Base Frame for minimal keeping stocks

These modular designs minimize downtime, allowing for rapid component replacement, ensuring continuous operation, saving cost, safeguarding the pressing efficiency, and adaptive to the requirements of MOSH and MOAH.



Lockable Cone Point Features to enable stable pressing ampere

6. Throughput Capacity:

Operational efficiency hinges on throughput capacity, and here, the First Press YTH-9.35 model excels with a throughput capacity of 1250 kg/hr, and its Second Press YTH-9.18 model achieves 750kg/hr, surpassing the common standard model in the market. This Second Press YTH-9.18 has stood as the highest 2nd press capacity in the industry. Higher throughput translates to increased productivity and faster processing times, providing a competitive edge in the market.



Clamping Bar Cage adaptable to Every Machine Housing and Base Frame for minimal keeping stocks

7. Cost Savings and Operational Efficiency:

By advancing kernel press maintenance practices, the YTH-9.35 and YTH-9.18 models deliver tangible benefits in terms of cost savings and operational efficiency. These benefits include:

Reduced Downtime: The streamlined maintenance procedures of the YTH-9.35 and YTH-9.18 models minimize downtime associated with servicing and repairs, allowing operators to maximize press uptime and production throughput.

Extended Equipment Lifespan: By implementing proactive maintenance practices, operators can extend the lifespan of press components and reduce the frequency of costly repairs and replacements. This leads to significant cost savings over the lifespan of the equipment.

Improved Product Quality: Well-maintained kernel presses enable palm kernels to have consistently low oil residuals. In return, the overall oil extraction rate (OER) of the plant can be improved.



Individual Removeable Slot Blade

Conclusion:

In conclusion, the YTH-9.35 and YTH-9.18 Kernel Press Models represent the pinnacle of KCP technology, embodying innovation, efficiency, and ease of maintenance. Through their advanced features such as **duo shaft design, individual removable slot blade, impact wrench-free maintenance, and modular design**, these models set new standards in the industry and empower KCP operators to achieve optimal performance and productivity, and of course by prioritizing ease of maintenance, these models empower operators to achieve higher levels of uptime and product quality.

The technical comparison with common market standard designs highlights the clear superiority of the YTH-9.35 and YTH-9.18 models across critical parameters. As the palm oil industry continues to evolve, embracing cutting-edge technologies like the YTH-9.35 and YTH-9.18 models is essential for staying ahead of the curve and driving sustainable growth. By leveraging these innovative solutions, KCP operators can optimize their processes, minimize downtime, and precision maintenance practices, and maximize profitability, positioning themselves for long-term success in the competitive global market.

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Palm Oil's Secret Ingredient: Boron



Weng Kee Ch'ng
Regional Sales Manager, Southeast Asia,
U.S. Borax



Fabiano Silvestrin
Global Market Development, Agriculture,
U.S. Borax

As demand for palm oil continues to rise, and the option to grow more palm may seem obvious. Yet, the more sustainable answer is to increase output and efficiency.

Today's researchers and palm growers recognize the importance of boron in increasing yield and crop quality. But do you know why palms need boron and how boron deficiency can affect your crops? Katherine Warington first demonstrated the need for boron as a plant nutrient in 1923. We now have 100 years of research and field trials showing the important role boron has in agriculture.

Why boron?

Standard NPK fertilizers are important, but oil palm plants also need essential micronutrients, most commonly boron. Better plantation management and plant husbandry have satisfied yield expectations, but these practices also make more boron-related

demands on palms and the land. Specifically clonal varieties that have been bred for high fruiting performance require and remove more boron from the soil.

Micronutrients are the tiny superheroes of a good fertilizer mix but do pose some limiting factors due to their parts-per-million soil concentrations. Low levels lead to deficiency symptoms and major yield shortages. In addition to its benefits, boron also acts as a catalyzer for most other plant nutrients including nitrogen, phosphorus, potassium, magnesium, and zinc.

In addition to playing a significant role in cell wall strength and membrane function, research has shown boron deficiency reduced pollen germination and viability. In the image below:

- Anthesising period: 1 – 5 days
- High pollination activity on day 2

What happens when boron is lacking?

Boron deficiency in palm oil can include:

- Hook leaf
- Fascination
- Inability for pinnae to expand
- Leaflet shatter
- "Blind leaf"
- "Fishbone leaf"
- Breakdown of the growing point results in dry heart rot



Transfer of viable pollens from male to female flowers

Agents wind & pollinating agents



Image source: Dr. Ramle Moslim



Good
Fruit set = 71.69%



Moderate
Fruit set = 31.13%



Poor
Fruit Set < 10%

And, perhaps most critically for a grower looking to increase yield, fruit set is poor when the plant does not get enough boron (see image above).

When boron is deficient, the signs are hard to miss, but by this point, it's already too late. To properly prevent boron deficiency, take steps during your regular nutrition application. Contact your local agronomist to learn about dosage requirements. Recommendations depend on planting materials, soil type, leaf/ foliar analysis, and soil analysis.

Types of borates

Although it is clear crops need boron, there is still debate as to what sources of boron are best. There are two borate classifications:

1. Those where the original source material has gone through a refinement process. Unsurprisingly, these are known as refined borates. Examples include boric acid, disodium octaborate tetrahydrate, borax decahydrate, borax pentahydrate, and anhydrous borax.
2. Those borates have had no refinement process. These are called mineral or unrefined borates. Examples include hydroboracite, colemanite, and ulexite.

Borate solubility by type

The more soluble a product is, the more boron is available to the palm. The borate solubility depends on the source material and the interaction of boron with sodium (Na), calcium (Ca), and magnesium (Mg). The more Mg and Ca a borate has the less soluble this mineral will be.

Most borate fertilizers come from five boron ores (images continued on next page):

Hydroboracite ($\text{CaMgB}_6\text{O}_{11} \cdot 6\text{H}_2\text{O}$)

Calcium and magnesium borate: Practically insoluble in water (solubility of 0.8 g/L at 20° C)



Image from Rob Lavinsky, iRocks.com

Colemanite ($\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$)

Calcium borate: Low water solubility (4.7 g/L at 20° C)



Image from U.S. Borax

Ulexite ($\text{NaCaB}_5\text{O}_9\cdot 8\text{H}_2\text{O}$)

Calcium and sodium borate: Partial solubility in water
(10.9 g/L at 20° C)



Image from U.S. Borax

Kernite ($\text{Na}_2\text{B}_4\text{O}_7\cdot 4\text{H}_2\text{O}$)

Sodium borate: Water soluble (19.0 g/L at 20° C)



Image from U.S. Borax

Why solubility matters

Palm roots take up boron from the soil solution as uncharged boric acid. Boric acid is a small molecule and is the only element that isn't absorbed from soil as an ion. In the soil, boric acid (H_3BO_3) is transported to roots via mass flow—without water there is no movement of H_3BO_3 in the soil.

Once you apply borates to the soil, they will undergo chemical processes until they are transformed into H_3BO_3 . Regardless of the type of boron applied to the soil—ulexite, colemanite, or borax pentahydrate—plant roots will always uptake boron in the form of H_3BO_3 by mass flow. The H_3BO_3 is then absorbed and translocated via the xylem to the whole plant.

You may think that applying boric acid directly to the soil would be the best way to fix boron deficiency. However boric acid has a greater potential to cause plant toxicity compared to other boron sources. Because boric acid is readily available to be taken up by roots, the palm will absorb it too quickly to be of use—causing toxicity.

When ulexite is applied to the soil, only 35 - 46% of the boron present in this mineral will be released within 40 weeks, due to the strong bond between boron and calcium.

When a refined sodium tetraborate pentahydrate product (such as Granubor® from U.S. Borax) is applied to the soil, almost 100% of the boron present in the fertilizer will gradually release in the soil within 40 weeks.

If your borated fertilizer is only partially soluble in the soil solution, you're leaving fertilizer in your field—unavailable to your crops.

Refined borates from U.S. Borax

U.S. Borax agriculture products are fully refined to remove impurities and maximize potential plant uptake. This process results in a pure, natural product that provides optimized nutrition throughout the growing season.

Tincal, also known as borax, ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$)

Sodium borate: Water soluble (26.5 g/L at 20° C)



Image from U.S. Borax

Many of our products are OMRI® Listed and appropriate for organic farming, including:

- Fertibor® for direct soil application and Granubor®—a granular borate—can be applied either alone or in conjunction with NPK granular blends and can be used every six months.
- Solubor® is a soluble borate delivered at seeding or in young palm seedlings. Solubor® can also be mixed with insecticides or fungicides and is commonly used in nurseries in three to four applications. A preventative application of boron can be carried out during the fourth, eighth, and tenth months after germination. For seeding, we recommend doing a spray test on several seeds to find out the appropriate dosage of fertilizers before application to all plants in the nursery.

About U.S. Borax

U.S. Borax, part of Rio Tinto, is a global leader in the supply and science of borates—naturally occurring minerals containing boron and other elements. We are 1,000 people serving 650 customers with more than 1,800 delivery locations globally. We supply around 30% of the world's need for refined borates from our world-class mine in Boron, California, about 100 miles northeast of Los Angeles.

Our local agriculture experts understand the uses and benefits of boron on crops. In addition to a global sales team, we have several agronomists on staff to help fertilizer distributors maximize the benefits of borates in agriculture applications. Our ag team can answer individual growers' questions and concerns about their particular crop.

For more information: www.borax.com/oil-palm

Interview with Dr. Sathia Varqa, Senior Analyst Fastmarkets

(FORMER OWNER AND CO-FOUNDER OF PALM OIL ANALYTICS)



Palm Oil Analytics was founded by Sathia Varqa and Gus Lim in March 2016 in Singapore with the single mission of serving the palm oil industry with mid-day and closing market price assessment and commentary. The company grew to be known globally and quoted widely. In February 2023, Palm Oil Analytics was acquired by London-based price reporting agency Fastmarkets



Dr. Sathia Varqa is the Managing Editor and Senior Analyst with Fastmarkets based in Singapore

1. Could you elaborate on the expertise of the POA team and how it contributes to the quality of your market reports?

We publish daily market commentary and product pricing twice daily in our Palm Oil Asia Mid-day and Palm Oil Asia Closing reports. The reports offer our subscribers insights into the factors driving crude palm oil (CPO) futures daily.

We explain what's driving the CPO futures in the market commentary based on fundamentals by referring to the movement in related oils and supply and demand. While technical and sentiments are important in explaining the futures market movement, we mainly focus on the fundamentals. By fundamentals, I mean edible oils supply and demand dynamics.

We also report on cash market product prices in major origin and destination markets; Malaysia, Indonesia, China, India and the European Union. We speak to a wide range of market participants when assessing palm product prices. We also provide analysis covering monthly outlooks by engaging with a wide range of market participants online and offline.

Our primary focus is to explain palm price behaviour using fundamentals and offer insights to pricing direction to our readers.

2. In what ways does POA aim to bring clarity to the highly volatile and imperfect conditions of the palm oil market?

Markets operate in an asymmetrical world. By this I mean not all information and data are equally distributed and available to all despite the advancement of technology and the internet. This creates an imperfect market condition for market participants. Our role is to help reduce this imperfection by generating and publishing market and pricing information that will hopefully help and refine trading decisions.

We aim to offer clarity by consistently returning to fundamental analysis. We cannot ignore fundamentals in any market. If we set aside fundamentals, prices can often be heavily influenced by speculation and sentiment which can accumulate to create pricing bubbles which are ultimately unsustainable.

Prices could rise or fall due to technical or other factors, but ultimately, they revert to fundamentals. Fundamentals such as production, export, end-month stocks, imports, domestic consumption, mandates, trade policies and the dynamics of related edible oils are some of the variables to be taken into account when analysing the palm price behaviour. Although palm supply and demand particularly in Malaysia is critical in assessing palm pricing direction, we cannot ignore the behaviour of competing edible oils like soybean, rapeseed and sunflower oil as edible oils pricing tend to move in tandem with palm the most competitively priced oil.



Gus Lim, senior palm oil price reporter based in Singapore and been involved in trading and palm oil market price reporting for four decades.

3. How do you leverage social media in addressing the asymmetry of information?

Social media platforms are generally free and easily accessible, but they come with challenges. At Palm Oil Analytics we have always been active in using social media, viewing it as the best way to serve the industry whether you are a paid subscriber or not.

Our Palm Oil Analytics LinkedIn page has over 10,000 subscribers and followers, allowing us to publish data updates for everyone to access. This approach can help reduce information asymmetry, although we recognize that it is impossible to eliminate it entirely. Information asymmetry is a natural aspect of any market. Being active on social media and sharing information openly, we hope to bridge the gap and provide valuable insights to all our followers.

4. Could you provide examples of how POA identifies and reports on emerging opportunities and investment trends in the palm oil market?

We are now part of a bigger enterprise and this offers us plenty of opportunities to improve and refine our existing strengths but also to think about expansion into new areas.

Our team today comprises four editors covering palm prices and news based in Singapore and supported by a global sales team serving thousands of customers worldwide. Our market insights come from extensive engagement with stakeholders. The emerging opportunities in the palm market include biodiesel, used cooking oil, sustainable aviation fuel, sustainability and innovation in downstream products.

We are constantly engaged with the market daily but also present at major palm and laurics conferences and exhibitions.

A significant regulatory change is imminent, the EU deforestation regulation, which will take effect at the end of this year. From 31 Dec 2024, palm oil, coffee, cocoa, soy, cattle, timber and rubber entering the EU have to be both deforestation-free and legal i.e. produced in accordance with the relevant legislation of the country of production.

According to this law exporters or importers placing these seven specified products in the EU market will need to demonstrate that their product is deforestation-free and not linked to forest degradation from the period 31 December 2020 onwards.

Exporters will need to comply with rigorous due diligence requirements, providing evidence of the date of production and adherence to EU regulations. There are several critical challenges in coming up with the due diligence requirements from the basics of conflicting definitions of what is a 'forest', the identification of geolocation and traceability. Malaysia is in a strong starting position to meet the EUDR requirement but there are gaps and misalignments that the Malaysian Palm Oil Council (MPOC) are working on with the EU institutions to address them.

This and other regulations that are bound to come up in the future will offer plenty of opportunity to the industry to innovate, invest and expand their markets. We at Fastmarkets Palm Oil Analytics are well-positioned to serve the industry with information, pricing and insights.



Regina Koh, palm oil price reporter with Fastmarkets based in Singapore



Yaw Min Jie, palm oil price reporter with Fastmarkets based in Singapore



5. How do you see the role of POA evolving in the next five years within the global commodity markets?

POA was acquired last year by Fastmarkets, a British-based company that covers thousands of daily prices, from metals to battery raw materials to agriculture products. We are very optimistic about Fastmarkets Palm Oil Analytics' growth within the larger company, especially in terms of expanding the range of prices we can cover and the experience we offer to the readers.

Our technology will allow customers to customize, analyze and interact with price data across the edible oil complexes from around the globe.

We also look forward to participating in more conferences, meeting more people in the industry and engaging with the market participants.

Highlights of the Event



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Our Rigorous Palm Oil Standard Deserves Recognition for Sustainability

Malaysia's mandatory palm oil certification scheme, the Malaysian Sustainable Palm Oil (MSPO), is a world-class standard capable of helping Malaysian exporters and European customers adhere to stringent no-deforestation regulations.

This conclusion emerged from a recent webinar organized by the Malaysian Palm Oil Council (MPOC), featuring experts from the European Forest Institute (EFI), Dr Jossil Murray and Pierre Bois d'Enghien, a leading palm oil and rubber certification expert and the author of the MSPO EUDR gap analysis.

Over recent months, the EFI and Bois d'Enghien have conducted independent assessments of the MSPO standard, concluding that it includes robust requirements for no deforestation, mandatory reporting and auditing.

Bois d'Enghien said: "The MSPO is by any standards a world-class standard for agriculture."

The assessments also evaluated how closely MSPO aligns with the European Union's new Deforestation Regulation (EUDR), a complex regulation imposing new regulatory burdens on seven commodities imported into the EU, including palm oil.

The EUDR aims to reduce the EU's importation of products linked to deforestation, affecting stakeholders in Malaysia's palm oil supply chain.

Companies must provide due diligence statements demonstrating that their products are deforestation-free and specify the geo-location of land plots over 4ha.



Certifications like the MSPO are crucial in helping businesses meet EUDR requirements.

The experts identified a few areas for potential enhancement (referred to as “gaps”) to achieve full alignment with the EUDR.

In several aspects, the MSPO was found to be stricter than the EUDR.

For example, the MSPO has more rigorous labor standards and an earlier deforestation cut-off date (2019) compared with the EU regulation (2020).

Conducting these assessments offers Malaysia an opportunity to continuously improve its standards, staying ahead of competitors.

This highlights Malaysia’s commitment to sustainable agriculture, independent of EU regulations.

The MSPO was developed several years before the EUDR, driven by the Malaysian government and industry’s commitment to mandatory sustainability in the palm oil sector.

Even without the EUDR, the MSPO would continue to enforce stringent sustainability standards.



Source: www.nst.com.my



The MSPO deserves international recognition.

The EU, known for its leadership in environmental regulation, should acknowledge and reward countries like Malaysia that share these environmental commitments.

Recognizing the MSPO as a compliance tool for EUDR would reinforce the EU’s sustainability goals globally.

This recognition would have immediate benefits for stakeholders.

Malaysian farmers and exporters would face reduced burdens and costs, while European importers would gain assurance of deforestation-free, EUDR-compliant palm oil.

EU leaders would demonstrate a commitment to new partnerships with developing nations, encouraging others to develop strong sustainability standards.

While there is always room for improvement, experts agree that the MSPO is a high-quality standard fostering environmental change.

It deserves recognition for its role in promoting sustainable palm oil.

Belvinder Sron is Chief Executive Officer of Malaysian Palm Oil Council.

The above comments and opinions in the article are the author’s own and do not necessarily represent Asia Palm Oil Magazine’s view.

Advancing Sustainable Agriculture: A Collaborative Effort to Combat *Ganoderma* Infection in Oil Palm Plantations between MPOB and IBG Biofertilizer



Introduction:

The Malaysian palm oil industry stands as a vital pillar of the nation's economy, contributing significantly to both economic growth and social development. However, amidst its success, the industry faces a formidable challenge in the form of *Ganoderma boninense*, a fungal pathogen that causes Basal Stem Rot (BSR) disease in oil palm trees. This insidious disease, often referred to as the “cancer” of oil palm, poses a grave threat to plantations, resulting in substantial economic losses and environmental degradation. In response to this pressing issue, the Malaysian Palm Oil Board (MPOB) and IBG Manufacturing Sdn Bhd have embarked on a collaborative journey to develop an innovative solution – the iM-bioGuard biofertilizer. This article explores the groundbreaking partnership between MPOB and IBG, the development of iM-bioGuard, and its potential to revolutionize sustainable agriculture practices in Malaysia.

Partnership Announcement and Trial Initiation:

In March 2024, the Malaysian palm oil industry witnessed a significant milestone with the announcement of a collaborative partnership between MPOB and IBG Manufacturing Sdn Bhd. The partnership aimed to address the urgent need for effective measures against *Ganoderma* infection in oil palm plantations. At the heart of this collaboration was the development of iM-bioGuard, a biofertilizer infused with potent bacteria *Pseudomonas*, designed to combat *G. boninense* and mitigate the devastating effects of BSR disease.

The trial for iM-bioGuard commenced with great anticipation, marking a crucial step towards combating *Ganoderma* infection in oil palm plantations. Dr. Mohd Hefni Rusli, Head of Plant Pathology and Biosecurity at MPOB explained the potential impact of iM-bioGuard during the trial initiation ceremony

held in Machap Estate. “*G. boninense* poses a grave threat to plantations, causing substantial economic losses in Malaysia and Indonesia,” remarked Dr. Hefni. “Although the disease progresses slowly, it is difficult to intervene as the pathogen spreads via root-to-root contact and causes damage to the oil palm xylem system, ultimately resulting in palm death.”

Demonstration and Ministerial Visit:

As part of the trial initiation process, a demonstration showcasing the efficacy of iM-bioGuard was organized at Machap Estate, owned by United Malacca Berhad (UMB). The event drew the attention of industry stakeholders, including Deputy Minister of Plantation and Commodities, Datuk Chan Foong Hin. Datuk Chan’s presence underscored the government’s commitment to supporting initiatives aimed at addressing critical issues in the palm oil industry.

During the demonstration, Datuk Chan expressed optimism about the potential impact of iM-bioGuard, emphasizing the importance of collaborative efforts in advancing sustainable agriculture practices. “The introduction of iM-bioGuard represents a significant milestone in our collective efforts to mitigate the devastating effects of *Ganoderma* on the oil palm industry,” remarked Datuk Chan. “I hope that by starting the first trial with UMB, it can help to increase crop resilience while promoting environmentally sustainable practices.”

Following the demonstration, Datuk Chan embarked on a visit to IBG Manufacturing Sdn Bhd to gain insight into the company’s biofertilizer production process. The visit provided Datuk Chan with a deeper understanding of IBG’s technological capabilities and commitment to innovation in sustainable agriculture. “I commend the collaborative efforts between the private sector and government agencies for the betterment of the palm oil industry,” said Datuk Chan. “My gratitude to IBG Group CEO Datuk SP Yeat and the entire team for hosting the visit.”





Technological Capabilities and Collaborative Research:

IBG Manufacturing Sdn Bhd's commitment to innovation and quality was evident during Datuk Chan's visit. With the largest fermentor system in the industry and ISO-certified facilities, IBG showcased its technological capabilities aimed at revolutionizing crop production and promoting soil health. The tour highlighted IBG's role as a pioneer in sustainable agriculture, with a focus on enhancing crop yields and reducing chemical fertilizer application rates.

Collaborative research efforts between IBG and MPOB on *Ganoderma* prevention using bacterial formulations further exemplify the company's dedication to driving positive change in the palm oil industry. The partnership between IBG and MPOB signifies a united front in advancing sustainable practices and safeguarding the future of Malaysia's oil palm industry. Through ongoing trials and collaborative research, the industry can look forward to innovative solutions that address critical challenges and promote long-term sustainability.



Conclusion:

The collaborative partnership between MPOB and IBG Manufacturing Sdn Bhd represents a significant step forward in addressing the challenges posed by *Ganoderma* infection in oil palm plantations. Through the development of iM-bioGuard biofertilizer, the partners aim to revolutionize sustainable agriculture practices and mitigate the devastating effects of BSR disease.

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MPOB to Introduce New Innovative Techs, Services at Launch of Transfer of Technology 2024



The Malaysian Palm Oil Board (MPOB) will be introducing new innovative technologies and services due to research and development (R&D) encompassing the upstream and downstream sectors of the palm oil sector.

In a statement, MPOB director-general Datuk Dr Ahmad Parveez Ghulam Kadir said the technologies will be launched in conjunction with the Transfer of Technology (TOT) MPOB on July 4, 2024.

He said that the technology and services produced by MPOB are offered to industrialists and local companies, including micro, small and medium enterprises, for commercialization.

“As a research agency in the palm oil industry, MPOB continues to be committed to exploring all aspects of technology that can be developed, so that the country’s palm industry remains competitive on the global stage,” said Ahmad Parveez.

The annual TOT MPOB is the agency’s main platform for stakeholders in the palm oil industry and local entrepreneurs to explore business opportunities by commercializing technologies and formulations of palm oil-based food and non-food products.

In addition, the exhibition will highlight technology and innovation in the palm oil sector and a space for interaction with researchers or technology “inventors”, as well as funding agencies for commercialization, according to the value chain ecosystem and the current needs of the palm oil industry.

At last year’s TOT MPOB, two new technologies were offered: True-to Type Version 2 — High-Resolution Genotyping Platform for Parental Identification, and palm-based Mozzarella cheese analogue.

Entry at TOT MPOB is free and the agency urges visitors to interact with MPOB researchers at the exhibition, and participate in the technology commercialization-sharing session (Pocket Talk).



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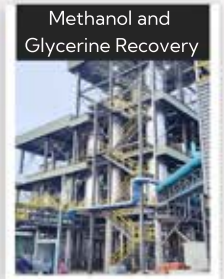
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