



# Indonesian Company Makes Scientific Breakthrough in Oil Palms

## *Sumatra Bioscience Announces Publication of World's First Patent to Produce F<sub>1</sub> Oil Palm Hybrids*

**SINGAPORE** – 7 October 2008 – Sumatra Bioscience, a subsidiary of PT PP London Sumatra Indonesia Tbk (Lonsum), today announced that it has developed the first process to produce F<sub>1</sub> oil palm hybrid seeds. An F<sub>1</sub> oil palm seed is a first generation offspring of two distinctly different genetically uniform oil palms, each with two identical sets of chromosomes.

The process, which involved no genetic modification, will enable the company to produce F<sub>1</sub> oil palm hybrids that are expected to more than triple conventional yield. This is based on historic yields from other F<sub>1</sub> hybrid crops such as corn (maize), which annual yield has increased six folds since the early 1930s. Today, approximately 95% of corn crops in the United States are grown from F<sub>1</sub> hybrid seeds. F<sub>1</sub> hybrids have also been achieved in many other crops such as oil seed rape, sunflower, sugar beet and rice, as well as in fruits, vegetables and ornamental plants.

However, there has been little progress with oil palms until now principally due to the lack of any method to produce homozygous, or genetically uniform, oil palms. This is because commonly used methods to produce homozygous lines in other crops were not feasible with oil palms as a result of its breeding system and long generation time.

The development of F<sub>1</sub> oil palm hybrids will benefit the world and the environment greatly because of their ability to generate higher yields, which will result in less land being needed for crop cultivation. It could also help alleviate the escalating global food shortage crisis. According to World Bank's estimation, the global demand for food is expected to double by 2030, while world's population is expected to grow by another three billion by 2050.

This pioneering work was undertaken by Sumatra Bioscience, a newly created R&D company under Lonsum. Sumatra Bioscience will spearhead the company's R&D activities and collaborative partnerships in oil palms and other food crops both in Indonesia and around the world. It inherits the decades of R&D efforts undertaken by Lonsum's Bah Lias Research Station.

Bryan Dyer, Director of Sumatra Bioscience, said: "This is a major breakthrough for the global oil palm industry because increasing yields per unit area of land will reduce the pressure to use more land for oil palm cultivation. While F<sub>1</sub> hybrids have been achieved in many other food crops, it is the first time anyone has come close to doing the same for oil palm."

The news came on the back of the publication of a patent from the European Patent Office, which verifies Sumatra Bioscience's approach to F<sub>1</sub> oil palm hybrids as the first of its kind and thereby potentially allowing it to become the first commercial producer of F<sub>1</sub> oil palm hybrids.

"Palm oil is the most productive of all oil crops with the highest yield per unit area. This explains why R&D centres across the world continue to invest in research to increase the oil palm yield. We believe that our F<sub>1</sub> oil palm hybrids will offer unrivalled value for oil palm plantations and farmers," Mr Dyer added.

The process to produce F<sub>1</sub> oil palm hybrids involves the following steps:

- **Identifying haploid and double haploid oil palm seedlings through screening:** Using morphological screening, flow cytometry and molecular markers, Sumatra Bioscience has successfully identified more than 600 rare, naturally occurring haploid oil palm seedlings. Haploids have half the number of chromosomes of a normal diploid oil palm seed.
- **Doubling naturally occurring haploids:** Sumatra Bioscience is in the midst of doubling the haploids to produce homozygous doubled haploids. These homozygous doubled haploids will then undergo rigorous testing of their progenies in field trials.
- **Crossing superior homozygous doubled haploid to produce F<sub>1</sub> oil palm hybrids:** After thorough testing and evaluation, Sumatra Bioscience will cross the superior quality homozygous doubled haploids to produce F<sub>1</sub> oil palm hybrid varieties for commercial release.

Director of Research at Sumatra Bioscience, Stephen Nelson, said: “Sumatra Bioscience is firmly committed to F<sub>1</sub> oil palm hybrids as they are more economically viable and environmentally sustainable. We will continue our research on F<sub>1</sub> oil palm hybrids with an aim to increase yields further to achieve the physiological potential which is conservatively estimated at 18.5 tonnes of oil per hectare per year, as well as produce trees with a range of traits to meet the demands of both the small- and large-scale oil palm plantations.”

Sumatra Bioscience expects to commercialise the production of F<sub>1</sub> oil palm hybrids by 2018. It aims to market at least 30 different hybrid varieties at any one time, which may be produced in mass quantities to meet market demand without sacrificing quality.

In line with its commercialisation plans, Sumatra Bioscience will invest US\$5 million to expand its existing R&D facilities. The expansion will increase R&D activities at Sumatra Bioscience by up to 10 times and will boast expanded capabilities in genomics, and tissue culture research to support the breeding work in progress. Sumatra Bioscience will continue to invest in its agronomy and crop protection divisions to ensure robust systems are developed for its customers to realise the genetic potential of its seed.

The bulk of the research on F<sub>1</sub> oil palm hybrids was conducted in Indonesia at Sumatra Bioscience. The team of local scientists was also supported by three international scientists namely: Professor Peter Caligari, Managing Director, BioHybrids Limited; Professor Jim M Dunwell, The University of Reading, UK; and Professor Mike J Wilkinson, University of Aberystwyth, UK. The team were assembled by BioHybrids International Limited, a UK company which provides research & development consultancy services for temperate and tropical crops.

Lonsum is the second largest plantation company listed on the Jakarta Stock Exchange and is amongst the leading palm oil producers in Indonesia.

## **Sumatra Bioscience**

Sumatra Bioscience is a leading research & development centre focusing on plantation crops such as oil palm, rubber and cocoa and has been operating in Indonesia since the 1980s. The company, which inherits decades of expertise and work of the Lonsum's Bah Lias Research Station, will spearhead research on tropical crops as well as collaborative efforts around the world.

Boasting more than 20 years of experience in seed production, Sumatra Bioscience is one of the world's leading oil palm seed producers. The centre is synonymous with oil palm seeds that are high in yield and low in dura contamination. On average, annual palm product yield from a palm oil tree grown from a Sumatra Bioscience seed reaches as high as 6 to 7 metric tonnes/ ha, compared to the industry average of 3 – 4 tonnes/ ha. With demand rising rapidly, Sumatra Bioscience currently sells about 20 million germinated oil palm seed per year and strictly controls production to ensure customers receive the highest genetic quality.

## **PT PP London Sumatra Indonesia Tbk**

Founded in 1906, London Sumatra (Lonsum) is the second largest plantation company listed on the Jakarta Stock Exchange and one of the leading palm oil producers in Indonesia. Its operations encompass the breeding, planting, harvesting and processing of oil palm fresh fruit bunches (FFB) to produce crude palm oil (CPO) and palm kernel oil (PKO). The Company also grows, produces and sells significant quantities of rubber, and also cocoa and tea.

Central to Lonsum's operations is a firm commitment to research & development (R&D). Its estates are amongst the highest-yielding oil palm plantations in Indonesia and the world. The average CPO extraction rate achieved by Lonsum in 2004 is one of the highest in the world. Currently, the Company has 38 nucleus plantations and a further 7 small-holder plantations in Indonesia, located in Sumatra, Java, Kalimantan and Sulawesi. In total, Lonsum manages over 100,000 hectares of land in Indonesia.

As a responsible palm oil producer, Lonsum is committed to promoting the growth and use of sustainable palm oil. The Company has been a member of the Roundtable on Sustainable Palm Oil (RSPO) since 2005, a unique international platform that has established a set of Principles and Criteria which cover legal, technical, environmental, social and plantation aspects of sustainable oil palm production. 2008 is the first year in which external accredited expert companies can audit for adherence to these Principles & Criteria, and Lonsum hopes to achieve Certified Sustainable Palm Oil production in this first year. In 2006 all of Lonsum's plantations and factories achieved ISO 14001 certification.

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