

**Prof Denis Murphy**

**High Yielding palm oil leads to environmental sustainability and socio economics benefit.**

## **Can the oil palm industry be environmentally sustainable? A British scientist's perspective**

### **Being a non-Malaysian, how did you get involved in oil palm research?**

The five major edible oils crops grown around the world in order of importance are oil palm, soybean, maize, rapeseed, and sunflower. Fats and oils are essential nutrients that make up 40% of our calorie intake and serve other important health functions. For a plant breeder like me, what is important is developing crops that are productive, sustainable and high yielding. I worked with many temperate crops like soybean and rapeseed. When I realised oil yield of oil palm was ten times higher than temperate crops, that made me switch my area of research.

### **Tell us about your research background**

My first exposure to oil palm research was in the early 1990s when I met leading Malaysian researchers at several international conferences. I was very intrigued by this tropical oil crop and I got deeply involved in oil palm research. Prior to that I was a Fulbright Fellow at the Univ of California, working on temperate oilseed crops. In the 1980s I set up a lab at Durham University, UK to apply the newly emerging biotechnological methods to improve the oil composition of these important crops. For 10 years in 1990s, I was the Head of the Oilseeds Research Dept at the renowned John Innes Centre in Norwich, UK where I was studying how major oilseed crops, especially rapeseed could be improved for both food and non-food uses. However, from the mid-1990s, when I knew that oil palm has the potential to produce 10 times more oil, which means less land and more oil, I became more focused on this crop.

### **What are the benefits of high-yielding oil palm?**

My area of research underpins development of new high yielding oil palm varieties. In 2020, Sime Darby Plantation Bhd announced that new varieties capable of almost 10 T/ha oil yield were under commercial development, which is more than 2.5 times the current average oil yield of about 3.8 T/ha. Other companies are working on similar projects and some plantations are already able to achieve 6 T/ha on a commercial scale. What does all this mean?

If most of the current oil palm land is replanted with these varieties over the next decade, an extra 20 to 30 million tonnes of oil could be produced on the same land area as is used today.

This would avoid the need for future expansion onto forest or peatland so would end the deforestation problem.

Individual growers, including smallholders, would generate more oil and therefore higher profits with consequent socioeconomic benefits.

Increased profit could be invested into transforming plantation industry from a labour-intensive and relatively low skilled operation to a semi-mechanised and higher skilled format, reducing labour costs. This would help secure the place of Malaysia as the global leader in this technology and allow it to provide the new crop varieties and mechanical technologies such as mechanisation to other major oil palm growing regions, most notably SE Asia, W Africa & S America.

Younger people, especially children of ageing smallholders (current average age about 60), would be more likely to be attracted into a more profitable business enterprise

Climate change is likely to reduce yield due to increased disease, drought etc but high yielding oil palm would offset these losses

High yielding oil palm would be more competitive than other oilseed crops and could increase its market share globally.

### **What is your current involvement in Malaysia on oil palm?**

To support all these benefits through research, I established several collaborations with universities and research centres in Malaysia, especially with MPOB. From the mid-1990s I became more actively involved in joint research, which included hosting several Malaysian PhD students in my UK lab. In 2001, I was appointed as Chair of the Biology panel of the MPOB Programme Advisory Committee (PAC), which has carried out annual audits of MPOB R&D and recommended future research directions. I have also worked with industry partners as a consultant on biotechnology and breeding directions for crop improvement.

Over the past decade my work has expanded to cover broader policy issues such as sustainability and environmental concerns, including climate change impacts. I am truly enjoying my work as I believe this tropical oil crop is so environmentally friendly yet providing the world the demand for edible oil.

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