

Comparative Oil Content of Fresh Fruit Bunches Harvested from Oil Palms Grown in Peat and Mineral Soils

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It has been noted for some time by private oil palm millers in North Sumatera that mills processing crop predominantly from peat soils have oil extraction rates (OER) 1.0 to 2.0 per cent lower than sister mills processing crop from mineral soils. As Asian Agri's Research and Development (R&D) Department had established a number of Gen-1 and Gen-2 progeny and tenera clonal trials on both mineral and peat soils, bunch component analysis data from these 12 trials were re-examined in greater detail to determine whether there was any scientific basis to confirm the perception of lower oil content in bunches originating from peat soils. If so, the contributing bunch components and possible means to rectify these shortcomings were also identified. This paper summarises the findings of the above investigations.

Bunch component analysis carried out annually over a period of six years consistently recorded lower oil/bunch (O/B) in fresh fruit bunches (FFB) originating from peat, compared with their counterparts in mineral soils. Oil content was 1.7 to 2.5 per cent lower in Gen-1 progenies and 2.3 to 3.7 per cent lower in Gen-2 progenies. A similar trend was also recorded in tenera clones, with oil content being 2 to 3 per cent lower. This characteristic was consistently recorded in almost all of the progeny crosses and clones evaluated. The findings also showed that the deeper the peat, the lower the oil content.

All trials consistently showed that fertile fruit/bunch (FF/B), fruit/bunch (F/B), moisture content/mesocarp (MC/M) and oil/wet mesocarp (O/WM) were the four main bunch components responsible for the lower O/B recorded in peat soils. The lower FF/B and F/B were due to poorer pollination and fruit set, as male flower inflorescence production was significantly lower in peat as compared to mineral soils. As such, there is potential for improving O/B in peat soils by carrying out assisted pollination, either by manual means or by the Hatch and Carry system.

Correction of high MC/M and lower O/WM in fruitlets offers less scope for O/B improvement, as the underlying causal factors remain unknown. It is thought that peat soils' high water-holding capacity and high groundwater table may be contributing factors. Uptake of chlorine via application of high rates of potassium chloride fertilisers in peat may also be a factor, as chlorine uptake is known to increase mesocarp moisture content. A more in-depth study is required to ascertain the cause of the high MC/M ratio.

Keywords: Fresh fruit bunches, moisture content, oil content, palm oil, peat.