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Benchmarking Yield for Sustainable Intensification of Oil Palm Production in Indonesia using PALMSIM

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The physiological oil palm growth model PALMSIM can be used to estimate yield ceilings that provide benchmarks for sustainable intensification of oil palm production, either by expansion of cultivation to degraded sites or by increasing production from areas under cultivation. This is demonstrated using two case studies. In the first case study, PALMSI Mestimates of water-limited yield for Kalimantan was overlaid onto a recently published map showing degraded sites potentially suitable for oil palm cultivation. A large proportion (35.6%; or 115,300 lan²) of the identified areas fell into the potential productivity range of 35 to 40 tonnes FFB per hectare. In the second case study, PALMSIM was used to estimate potential yield for six plantation sites in Indonesia where best management practices (BMP) were assessed for yield intensification by the International Plant Nutrition Institute (IPNI) Southeast Asia Program (SEAP) and its collaborating plantation partners. Potential yields are generally higher in Sumatra than in Kalimantan due to higher solar radiation. Water deficit was a problem at two sites. The gap between water-limited yield and actual yield differs from location to location, and therefore requires a site-specific analysis. In these two case studies, the scope for sustainable intensification at regional and at plantation level was explored in a quantitative manner - a novel approach to oil palm production.

Keywords: PALMSIM, oil palm intensification, yield benchmarking.

