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## Evaluating the Global Warming Impact of Palm Oil Production. (I). A Field Model

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*There is substantial interest in the extent to which palm oil production affects global warming via its impact on fluxes of greenhouse gases. Oil palm planting has expanded considerably in recent years, most markedly in Southeast Asia, replacing forest and other vegetation and hence most likely changing the overall carbon balance of the region. Several previous attempts have been made to assess effects of these changes and to determine the nature of the impacts. This paper describes a flexible model which applies to individual sites and stands of oil palm, and which takes account of the major factors likely to influence the carbon balance of the crop.*

*The model calculates all major on-site (plantation) and off-site (mill) gains and losses of C, taking into account different site conditions and management practices. It offers numerous options that include choice of previous land use and crop lifespan. There are specific options governing C emission from peat soils, while different crop yield potentials are represented via a choice of oil palm growth curves. Provision is made for input of data by the user. Different management options are catered for such as use of palm oil mill by-products and fossil fuel equivalent inputs in the field, the latter including both direct (i.e. fuel for transport and machinery) and indirect (fertilisers, herbicides, crop protection chemicals etc.) sources.*

*Outputs from the model showing effects of different previous land uses and other factors are presented. The model is also extended to track the C balance over successive oil palm crops.*

**Keywords:** Oil palm, land use change, carbon sequestration, greenhouse gas emission, single crop model.