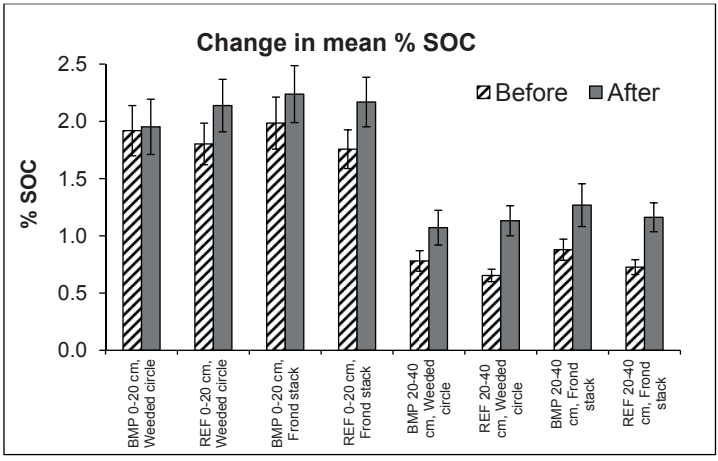
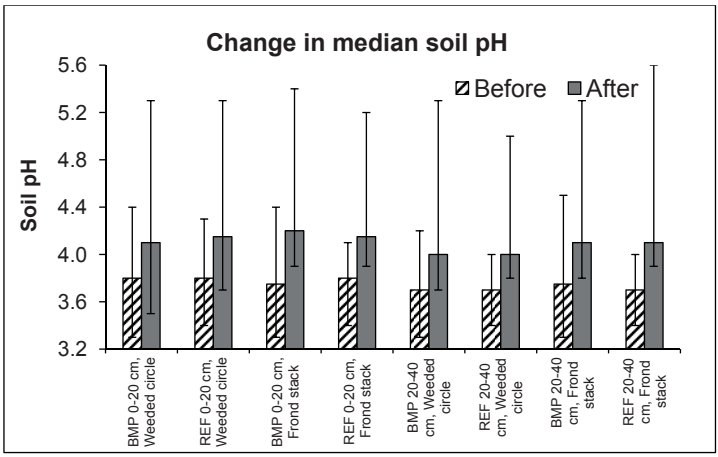
Environmental Footprint with Oil Palm Intensification

Indonesia and Malaysia produce 87% of the world's palm oil i.e., 53 Mt/yr, which is around 30% of the world's production of vegetable oil. Demand for vegetable oils has increased in a linear fashion since the 1970s, while demand for palm oil has grown exponentially because it is cheaper. Production has increased through area expansion with negative impacts on biodiversity, C accumulation and food security. Better management practices (BMP) can increase yields of palm oil from the average 4 t/ha to 5–6 t/ha or as much as 8 t/ha in good years. In an IPNI project over four years, BMP increased the harvest by increased crop recovery and also by increased crop productivity. This experiment also compared the effect of BMP with standard management (REF) on a range of soil properties across representative sites in Indonesia. Soil pH and soil organic carbon (SOC) increased in both the BMP and the REF treatments during the four years of the experiment (Figure). The increase in median pH varied between 0.3–0.45 units in both the BMP and REF blocks and at both sampled soil depths. The most important feature was that SOC percentage increased by about the same amount in the 20-40 cm depth as in the surface soil, with a range 0.03–0.48%. If we ignore the lowest figure, the range is 0.25–0.48%. At a bulk density of 1.4 g/cm3, common in plantation soils, the increase in SOC is 14-26 t/ha over the 4 years of the experiment (to 40 cm depth), or 3.5 to almost 6.5 t C/ha/yr. These high figures show potential to contribute as potential sinks for atmospheric CO_2. It would be worthwhile in future work to sample the soil to at least 1 m. The results show that with reasonable management, soil quality under oil palm can improve.





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