2017

August

Emerging Digital Technologies and Tools For Application to Oil Palm Plantations[+]

TEY SENG HENG*, CHEN ZI YAN*, LIEW YEW ANN*, NG HONG CHUAN*, TEO CHOR BOO*, DEVAN SUBRMANIAM** AND GOH KAH JOO*

This paper reviews how emerging digital technologies such as GPS receivers, satellite imagery and more recently unmanned aerial vehicles have been adopted for mapping, planning and monitoring in oil palm plantations. Developments in the sensor and robotic technologies have also prompted us to pay attention to potential useful gadgets like agricultural drones, industrial exoskeleton and even personal self-balancing vehicles that can be adopted to reduce the burden on workers. A functional 10 litre-payload agricultural dusting drone has been widely used for paddy and vegetable farming worldwide. A 12 litre-payload drone has also been introduced but there are challenges to be overcome before it can be adopted for spraying in oil palm fields.

The need to improve the efficiency of harvesting and crop recovery is emphasised to minimise crop losses. Harvesting with lightweight aluminum and fibre-carbon poles will remain relevant in the foreseeable future for tall palms. Further improvement may be achieved with the provision of suitable lift harness to reduce the burden of holding heavy motorised cutters and harvesting poles. A new cart that can lighten the burden on buffalos, reduce the inertial force of dragging and cut down the time of unloading collected fruit bunches onto platforms has been fabricated by a large plantation group in Malaysia. Further work is being done to eliminate the need of reloading bunches from platforms to trailers. In fertilisation, labour productivity has doubled from about 0.7 tonnes per manday with manual spreading to 1.7 tonnes per manday with the use of a mechanical spreader (manual loading) and increased substantially to 10 tonnes per manday on terrain accessible to tractors. In Latin America, an advanced variable-rate spreader claimed to be able to maintain a constant dosage of spread to within 10 per cent deviation of the intended rates of application have been successfully developed and used in oil palm plantations.

Keywords: *Oil palm, GPS, drone, remote sensing, digital terrain model, lift-harness, crop evacuation, buffalo cart, fertiliser spreader.*