

## From seedling to Citriodiol®

Jacqueline Watson, Managing Director, Citrefine International Ltd

Deforestation has resulted in soil erosion across Malawi and topsoil has been washed away into lake Malawi over the years, draining the quality of the soil and having a negative impact on agriculture and crop yields. Malawians live a hand-to-mouth way of life which is directly impacted by crop yields, so deforestation has not only contributed to climate change but has resulted in poverty and hunger.

The Kawandama Hills Plantation was established in 2009 by Jacqueline Watson (Managing Director) and Genevieve Faherty's (Regulatory Affairs Director) cousin and uncle in the beautiful Mzuzu district of Malawi. The plantation's values are very closely aligned with ours as a business; living and working in harmony with nature.

The plantation is 6,500 hectares, and in 12 years has planted over five million *Eucalyptus citriodora* trees, also known as *Corymbia citriodora*. The team conserves the indigenous forest that occupies half of the plantation, and plant the *Eucalyptus citriodora* trees around the forest, so that they are working with the environment, not against it. The plantation attracts the most amazing array of animals with hyenas, civets, servals, giant eagle owls, honey badgers and wild pigs making it their home, which is a good indication that nature is thriving.

### The green process

The *Eucalyptus citriodora* trees are grown for about 12 months before they are first harvested and then the leaves and twigs are taken to the distillation facility, where the team extracts the essential oil. This is exported throughout the year to us in the UK and then turned into Citriodiol®, the natural active substance for insect repellents. The waste leaf (also known as bagasse) is the only fuel source used to fire the boiler, while excess bagasse is used to maintain the plantation soil.

*Eucalyptus citriodora* oil contains a compound called p-menthane-3,8-diol (PMD) and another called citronellal. To ensure efficacy, we put the oil through a simple process converting high levels of citronellal in the oil into more PMD. The result is Citriodiol®, which contains a high proportion of PMD and has preserved the naturally occurring minor components in the *Eucalyptus citriodora* oil. The active substance is used across the world in insect repellent formulations readily available off the shelf in pharmacies and supermarkets.

Through the year, the plantation has between 140 and 160 people working in the business at any one time, from security management and field workers, to the distillation plant team.

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## Providing stability for local community

To accommodate the workers, the plantation has built two staff villages, one on the plantation and one near the Mkoko school. It has a fully Malawian management team who run the business and has also established a staff welfare fund, so that people can access loans for unforeseen events and emergencies.

The plantation always knew that it would need a school so that its workforce would settle and stay. Mkoko primary school was an abandoned state school just seven kilometres from the Kawandama Hills Plantation and so the plantation team applied to the Ministry of Education to reopen it so that its workers' children would have somewhere to study, along with other children from the community. The school now has 760 students and has been handed over to the government.

Giving back to the local community at the Kawandama Hills Plantation is of real importance to us at Citrefine. We have placed a strong emphasis on the welfare of the community and expansion of the Mkoko primary school, donating funds towards new classroom blocks, building housing for local teachers and supporting with every day community needs.

Our relationship with not just our customers but our suppliers and their communities is crucial, especially with the volumes of Citriodiol® we are producing; we have a strong working partnership based on transparency, mutual trust and respect and long may that continue.

