

## EMERGING THREATS OF PRIORITY AGROFORESTRY TREES IN AFRICA: CHALLENGES AND OPPORTUNITIES

Jane Njuguna<sup>1</sup>, Eston Mutitu<sup>1</sup>, Ely Mwanza<sup>1</sup>, Alice Muchugi<sup>2</sup>, and Ignazio Graziosi<sup>2</sup>

Agroforestry has a strategic role for Africa's smallholders, as it builds resilient agro-ecosystems and provides enduring benefits to farmers. The World Agroforestry Centre is conserving over 18,000 germplasm accessions of more than 200 tree species in globally established field genebanks and seed banks. Emerging biotic threats are targeting the cultivation of crucial tree species in Sub-Saharan Africa, thus frustrating local benefits of agroforestry and forestry. A stem canker disease caused by Botryosphaeriaceae pathogens is triggering extensive dieback to the Australian silk oak *Grevillea robusta*, widely used in Africa as highly adaptable, multi-purpose, and fast growing tree. Botryosphaeriaceae disease complexes are also involved in the newly detected dieback of native baobab *Adansonia digitata*, and, along with Teratosphaeriaceae species, in cankers of *Eucalyptus* spp. In addition, *Eucalyptus* planted forests in Southern and Eastern African countries are under attack from non-native bronze bug *Thaumastocoris peregrinus* (Hemiptera: Thaumastocoridae), blue gum chalcid *Leptocybe invasa* (Hymenoptera: Eulophidae), and red gum lerp psyllid *Glycaspis brimblecombei* (Hemiptera: Psyllidae). We developed laboratory protocols to detect fungal pathogens affecting *G. robusta* and *A. digitata* seeds and seedlings with the aim of distributing clean agroforestry material and reducing further spread of these organisms. We also implemented a countrywide survey to assess distribution, incidence, and population levels of *Eucalyptus* insect pests in Kenya. As the next step, we plan to determine variation in disease resistance within germplasm collections for *G. robusta* (40 accessions from Australia and Kenya) and *A. digitata* (297 accessions from Tanzania Burkina Faso, Kenya, Mali), and investigate the occurrence of natural resistance to insect pests in Kenya's *Eucalyptus* planted forests. Developing management strategies that include selecting for resistance to pests and diseases may be the key to mitigate biotic threats to agroforestry in Sub-Saharan Africa.

---

<sup>1</sup>Kenya Forestry Research Institute, P.O. Box 20412 - 00200 Nairobi, Kenya, (jwknjuguna@yahoo.com).

<sup>2</sup>World Agroforestry Centre, P.O. Box 30677, 00100, Nairobi, Kenya, (ignazio.graziosi@fulbrightmail.org).

Citation for proceedings: Nelson, C. Dana; Koch, Jennifer L.; Sniezko, Richard A., eds. 2020. Proceedings of the Sixth International Workshop on the Genetics of Host-Parasite Interactions in Forestry—Tree Resistance to Insects and Diseases: Putting Promise into Practice. e-Gen. Tech. Rep. SRS–252. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 170 p.