# Postdoctoral Fellowship in Population Genomics and Molecular Breeding of *Eucalyptus grandis*

**Supervisor:** Prof Zander Myburg, Forest Genomics Programme (FGP)
**Location**: Stellenbosch University, South Africa
**Duration:** Two years (full-time, with potential for extension based on funding and performance)
**Start Date:** Flexible, ideally by 28 February 2026 or as soon as possible after

**Position Overview**
The Forest Genomics Programme (FGP) at Stellenbosch University seeks a highly motivated postdoctoral researcher to join an international project investigating the genomics of growth, form, and woody biomass production in *Eucalyptus grandis*. The successful candidate will work with state-of-the-art genomic and computational resources and phenotyping technologies, collaborating with world-class researchers and industry partners to advance climate-resilient tree breeding.

**The Project**
The project leverages large-scale genomic resources recently generated by the US Department of Energy Joint Genome Institute (DOE-JGI) in an initiative led by Prof Zander Myburg, with co-leads Prof Justin Borevitz (Australian National University, ANU) and Prof Jill Wegrzyn (University of Connecticut, UCONN).
Key resources include:

- A new, nearly telomere-to-telomere phased reference genome for *E. grandis* (Lötter et al., 2025)
- 24 fully phased *E. grandis* pangenomes (i.e., 48 additional haplotype assemblies)
- Genome resequencing data (10-20× short-read coverage) for over 2000 *E. grandis* individuals representing the species' natural range in Australia and deeper (40-50x short read) coverage of 187 family representatives.

The *E. grandis* trees have been planted in replicated, reciprocal common garden trials (subtropical vs. temperate environments) hosted by South African forestry companies. Extensive phenotyping has been conducted using direct measurements, above-canopy drone imaging, and below-canopy terrestrial LiDAR scanning (TLS), led by collaborator Prof David Drew in the Department of Forestry and Wood Science at Stellenbosch University.
The research aims to integrate these resources to uncover DNA sequence and structural variants, and regulatory mechanisms underlying key traits for sustainable woody biomass production and climate-resilient tree breeding.
The fellow will join a dynamic, multidisciplinary team and international network of collaborators with access to cutting-edge genomics, computational and molecular biology facilities, as well as greenhouse, phenotyping and industrial field-testing facilities.

**Key Responsibilities**

- Perform population genomic analyses on large-scale *E. grandis* resequencing data aligned to the new phased reference and pangenome resources.
- Construct Haplotype Reference Panel (HRP) and perform genome-wide genotype imputation for 2000 resequenced individuals.
- Integrate genomics and high-resolution phenotypic data (e.g. from drone imaging and TLS).
- Conduct genome-wide association studies (GWAS) to link genomic variation to growth, form and wood property traits.

- Optimize bioinformatics pipelines for genotype imputation, trait association and gene discovery in a high-performance computing environment.
- Design and execute validation experiments including additional genotyping, 'omics analyses, comparative and evolutionary genomics, and greenhouse and field testing.
- Contribute to high-impact publications, grant proposals, and supervision of postgraduate students.
- Collaborate with international partners (JGI, HudsonAlpha Institute, ANU, UCONN, Camcore, North Carolina State University and others) on genomics and quantitative genetics, and with industry partners (Sappi and Mondi) on fieldwork, phenotyping and molecular breeding applications.

**Required Qualifications and Skills**

- A PhD degree in Genetics, Genomics, Bioinformatics, Plant Sciences, or a closely related field, obtained within the last 5 years
- Proven experience in population genomics and analysis of next-generation sequencing (NGS) data, including variant detection, genotype imputation, population structure analysis and association genetics (GWAS)
- Proficiency in programming/scripting (e.g., Python, R) and the use of NGS and GWAS related bioinformatics tools (e.g., bwa, samtools, GATK, VCFtools, Beagle, IMPUTE, PLINK, TASSEL and others) and the use of cloud-based computational resources
- Background in population and quantitative genetics, and related statistical analyses
- A track record of peer-reviewed publications in genomics, genetics or related fields
- Excellent communication skills in English and ability to work independently and collaboratively

**Recommended Qualifications and Skills**

- Strong interest in and experience with plant/tree genetics and genomics aimed at plant improvement
- Familiarity with GWAS, QTL mapping, genomic selection and molecular genetics in general
- Hands-on experience with high-performance computing (HPC) and cloud-based platforms
- Knowledge of integration of genomics and remote phenotyping (drone imaging, LiDAR)
- Prior work in forest genetics, field phenotyping, or data visualization/machine learning in genomics.

**Funding and What We Offer**

The position is funded by Stellenbosch University, with contributions from South African forestry companies (Sappi and Mondi), and government grants from the South African Department of Science, Technology and Innovation (DSTI) and the Forestry Sector Innovation Fund (FSIF). The latter are grants funding collaborative activities at Stellenbosch University and the University of Pretoria.

- Competitive tax-free stipend aligned with South African postdoctoral norms and experience
- Support for local or international relocation to Stellenbosch (limited)
- Access to advanced DNA sequencing, computational infrastructure, and international research networks
- Opportunities for professional development, conference attendance, and career advancement.
- Participation in IUFRO Tree Biotechnology 2027 Meeting (April 2027) – Stellenbosch and Cape Winelands
- A supportive academic environment embedded in the beautiful Stellenbosch winelands region and proximity of the picturesque coastline of the Western Cape of South Africa.

**How to Apply**

Submit the following as a single PDF to Prof Zander Myburg at zandermyburg@sun.ac.za (cc: Dr Nanette Christie, nanettechristie@sun.ac.za)

- Cover letter (max 2 pages) describing your research interests, relevant experience, and motivation for this position.
- Full CV, including publication list and contact details for at least two academic referees.
- Copies of academic transcripts and PhD certificate (or expected PhD completion date).

**Closing date**
Applications will be reviewed on a rolling basis until the position is filled. Early expressions of interest (by email) are encouraged. Shortlisted candidates will be invited for interviews (virtual or in-person, if possible). Stellenbosch University is committed to employment equity, diversity, and inclusion; applications from underrepresented groups are especially encouraged.

For further inquiries, contact Prof Zander Myburg at zandermyburg@sun.ac.za.
We look forward to your application!