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Silviculture Research Group



Part-time support
from Steyn Viljoen
(Nursery manager)





Main focus areas for silvicultural research



1. Silviculture
 - Dryland Industrial and Rural Afforestation Programme
 - Research in dry savanna forests
2. Carbon sequestration
 - Allometric studies for above-ground biomass
 - Below ground biomass, forest floor and soil C pools
3. Forest soils and nutrition
 - Controlled-release fertilizers
 - Wood ash application to soils
4. Fire management
 - Repeated controlled burning under pines
 - Fire in savanna forests
5. Forest eco-physiology



1A. Plantation silviculture

- The interaction between site, harvest residue management and plant stock quality on *Eucalypt* transplant survival, growth and uniformity (PhD candidate Dean da Costa)
- The potential for Eucalypt hybrids in farm forestry in the semi-arid winter rainfall region of South Africa (MSc candidate Hugo Lambrechts)
- The growth and timber value implications of an altered thinning regime in *Pinus patula* (Francis Zhangazha)
- International Link = exchange with USP - ESALQ

Prof. Leonardo Gonçalves

Student interns:

Amanda Franci, José Rocha

Visitors to ESALQ:

Deon Malherbe, Anton Kunneke, GP Scheepers



E. gomphocephala,

Atlantis area



1B. Dry savanna forest research



- Effects of thinning intensities on the growth regeneration of *Burkea africana* and *Pterocarpus angolensis* in the Zambezian-Baikiaea woodlands. (Werner Mbongo - PhD)
- Effect of Rainfall gradient and Fire disturbance on Natural Regeneration and stand characteristics of selected tree species in the Zambian Phytoregion (Paul Mwansa - MSc)
- Effect of fire history on the concentration of root carbohydrates of encroaching *Terminalia sericea* at the Waterberg plateau park, Namibia (Siphiwe Luthibezi – MSc)
- Collaboration with Namibia UST, SLU & SASSCAL
Co-supervision with Drr. V de Cauwer & D. Joubert

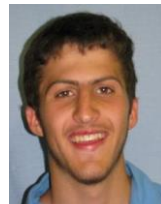




2. Carbon sequestration



- Carbon storage in South African plantations (with PAMSA)
 - *Above-ground biomass*
 - *Below-ground biomass*
 - *Forest floor and soil*
- Estimating C sequestered in an undisturbed *Cryptosepalum* forest in NW Zambia
(MSc candidate Martin Kambayi)
- Collaboration with SASSCAL, ICFR, DEA
- Co-supervisor to MSc students on allometric studies in SA plantation species (with D. Drew & S. Dovey)
 - Philip Muyambo – *P. elliottii*
 - Philip van Niekerk - *E. gxn*





3. Forest Soils & Nutrition



- Fertilizing *P. elliottii* across various edaphic conditions in Tsitsikamma: effects on nutrient dynamics and stand productivity (PhD candidate GP Scheepers)
- The effect of wood ash on the soil properties, nutrition and growth of *E. g x u* grown on a sandy coastal soil in Zululand (with GP Scheepers)
- Controlled-release fertilizer increases nutrient uptake and eucalypt growth on subtropical sands (with MSc graduate Ralston Hans)
- Effects of Calcium and lime applications on eucalypt growth – literature review with José Rocha
- Collaboration with: ESALQ, ICFR, Soil Science at SU, Mondi and MTO





4. Fire research



- The impact of repeated prescribed burning in semi-mature pine plantation forests of Mpumalanga on fuel loads, nutrient pools and stand productivity. (**MSc graduate Christoff Gresse**, currently with MTO)
- Carbon dynamics and nutritional sustainability of South Africa's pine plantation soils: A case study of Mpumalanga escarpment forests subjected to different burning regimes (**PhD candidate A. Kunhlande**)
- Information exchange with Prof. Mark Adams, Mike Cantelo (Australia), Ben Bothma, Dr. Neels de Ronde, & Prof. Winston Trollope (NMU)



Collaboration with Mondi, KLF, Sasscal

Department of Forest and Wood Science





5. Eco-physiological research



- The effect of periodic drought events on the architecture of *Pinus radiata*

In collaboration with Dr. Michel Vennetier, France

- Carbohydrate storage in roots of coppicing species from the dry savanna forest

In collaboration with Dr. Elizabeth Rhower, SU

- Short-term growth responses as a function of water availability or deficit

In collaboration with TUM, Padova

- WUE, tree ring and carbon isotope research

In collaboration with U. Padova, Mondi

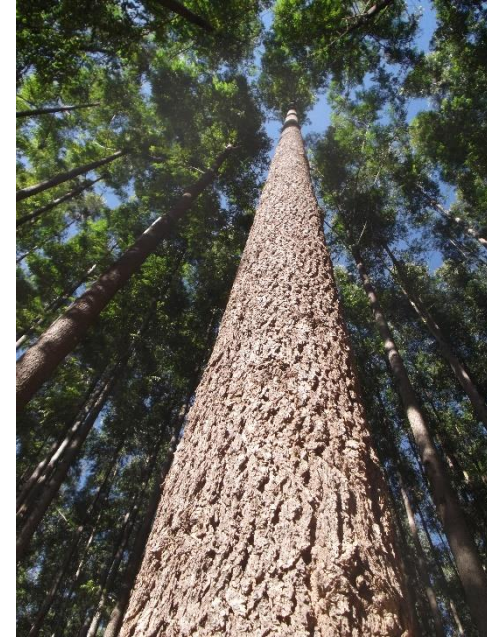




Closing comments



- Our goal is forests that are...
 - Water use efficient
 - Productive
 - Sustainable
 - Fire resistant
 - Resilient to climate change
 - Well matched to sites, using diverse species
 - Capable of serving diverse markets
 - Efficient carbon traps



» Or all of the above!

- ... and to produce postgraduate students that can assist in working towards this goal