**Philani Justice Dlamini**

Plant Breeder and Biotechnologist

SACNASP: Candidate Natural Scientist (Reg. # 120507)

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# SUMMARY

Philani has been actively involved in crop science research and has gained extensive research experience on different aspects of crop production including plant biotechnology, horticulture, mushroom cultivation and plant genetics. He is also actively involved in the team responsible for the establishment and implementing of the South African Phenomics Research Infrastructure Network, which will include sharing cutting-edge research technologies in South Africa for Plant Phenotyping and Precision Agriculture. He is a registered scientist under the South African Council for Natural Science Profession (SACNSP) and a registered member of the South African Society of Crop Production (SASCP).

# WORK EXPERIENCE

**Fungal Genomics Research Assistant Forest, Agriculture and Biotechnology institute, University of Pretoria**

**1 August 2021 – Present**

* Isolating DNA from fungi and plants for NGS sequencing
* Isolating RNA from fungi and plants for RNA sequencing
* Running DNA sequencer
* Genome assembly and annotation
* Assisting in student research project

**Plant Biotechnology Research PDP Agricultural Research Council, Pretoria, Gauteng**

**1 April 2021 – Present**

* Functional characterising the role of different kinesin genes in facilitating BBTV spread in banana
* Developing BBTV resistant lines using biotechnology assistant breeding.

**Plant Biotechnology Research Intern Agricultural Research Council, Pretoria, Gauteng**

**1 April 2019 – 30 March 2021**

**Plant Genome Engineering Project**

* Conducting transcriptomic responses analysis to the banana bunchy top virus (BBTV) infection to identify BBTV susceptibility genes in banana
* Optimizing *Agrobacterium* transformation protocol for the delivery of the CRISPR constructs on Banana suspension cells
* Doing CRISPR gene editing and analysis of indels on generated plant material
* Identifying Single-nucleotide polymorphism (SNP’s) and other microsatellites (SSR) to be used for Cannabis DNA fingerprinting in South Africa.

**Plant Tissue Culture Lab**

* Assisting with maintaining and multiplying in vitro plant cultures of *Ornithogalum*, banana and grapevine
* Performing meristem initiation in banana from farm material as needed to create mother block cultures. Maintain mother block cultures by transferring to fresh media
* Work with the Research Scientist to optimize media requirements for different stages of growth to ensure adequate multiplication rates are achieved
* Developing and optimizing banana tissue culture protocols to establish suspension cells to be used for CRISPR/Cas9 gene-editing project
* Co-ordinating the Molecular Plant-Microbe Interactions Journal Club, a collaboration between the University of Pretoria-FABI and ARC-PPRI
* Co-organizing trips for collection of initiation material in Nelspruit ARC farm or utilizing ARC-Tropical and Subtropical Crops laboratories for callus initiation
* Developing standard operation procedure (SOP) for deferent laboratory equipment in biotechnology and virology laboratory

**Operation Manager Seng’khona Group, Germiston, Gauteng**

**January 2019 – June 2019**

* Providing administration for human resources and act as the first point of contact for all HR admin-related queries
* Controlling budgets for security operations and monitoring expenses
* Recruiting, training and supervising security officers and guards
* Responsible for the timely and accurate delivery of day-to-day HR/payroll administrative support and client services to hotel management and employees including but not limited to write letters, contracts of employment, employee leave, remuneration and benefits, record keeping, reporting and information management systems
* Management of SAGE pastel payroll system
* Responsible for continuous review and improvement of risk assessment and risk management
* Ensure that the research practices comply with the OHS Act and regulation 85 of 1993, Act 36 of 1947, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and ISO 17025

**Summer Crops Breeding Intern Sensako PTY LTD, Bethlehem, Free State**

**October 2016 – September 2017**

* Conduct plant breeding trials to develop wheat cultivars with improved yield, biotic and abiotic stress tolerance
* Conduct field research aiming to provide improved farming practices that are cost-effective and timely
* Organize seed stocks in the warehouse to prepare them for sowing
* Providing technical and agronomic support and advice to farmers
* Provide research support to Agronomist through problem investigation, product development and improvement
* Conduct field research aiming to provide improved farming practices that are cost-effective and timely e.g. drone technology, NDVI, and satellite images
* Pollinating, collecting flowering data, harvesting, shelling seeds, and trial planting (collecting seeds from the storage unit, sorting, packing according to the planting order and scan to verify the order)
* Conduct plant pathology trials to test the susceptibility of newly developed wheat hybrids to different wheat pathogens
* Ensuring the company follow Quality Assurance (QA)/Quality Improvements processes
* Develop standard operating procedures (SOP) and work instruction for seasonal workers
* Ensure that the research practices comply with the OHS Act and regulation 85 of 1993, Act 36 of 1947, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and ISO 17025

**Horticulture Graduate Trainee Ethekwini Municipality, Durban, KwaZulu-Natal**

**April – September 2016**

* Monitoring a nursery and propagating various vegetable crops (tomato, onion, cabbage, beetroot, brinjal & pepper)
* Actively working on the daily horticultural tasks in the gardens and tunnels. Work with teams as necessary to set a best in class example and to direct the required performance and level of productivity.
* Seedling transplanting, insect, weed & disease monitoring/diagnostics and recommending treatment
* Managing and supporting overall plant health and soil nutrition strategies for all gardens to include sustainable gardening practices and integrated pest management in the gardens, vegetable garden, vertical gardens
* Providing agricultural extension support to help small scale farmers to access information and establish viable independent agribusinesses
* Detailed computerized field reports & record keeping
* Crop budgeting & planning for the municipality hand-out to communal farmers including plan and implement operational process to meet the municipality goals
* Prepare trial protocols, trial execution and data processing as well as drafting of reports
* Liaising with the Department of Rural Development and Land Reform officials for development of the commercial agriculture policies and guidelines to ensure effective and efficient commercial agriculture development functions at municipality level
* Liaising with AgriSETA accredited training institutions in developing learning material for plant production for SAQA aligned National Qualification Framework (NQF) Level 1 and 2
* Training and facilitating communal farmers in plant production

# EDUCATION

**2021-in progress : PhD Plant Biotechnology**

Institution : University of Pretoria

Study Title : CRISPR/Cas9 gene-editing towards resistance to the Banana bunchy top virus in banana

**2019 : MSc Agriculture (Plant Science)**

Institution : University of Zululand

Dissertation title : *In vitro* mutagenesis and preliminary characterization of potential drought-tolerant sugarcane lines

**2016-incomplete : BSc Chemistry and Computer Science**

: University of South Africa

**2015 : BSc Agriculture (Agronomy)**

Institution : University of Zululand

Dissertation title : Comparative study on growth performance of mushrooms (*Pleurotus Djamor* and *Pleurotus eryngii*) and shiitake

(*Lentinula edodes*) on different temperatures in Zululand

# SHORT COURSES & CERTIFICATES

Drones for Agriculture : Wageningen University & Research, [1 Aug – 2 Oct 2020]

Netherland

Next Generation Sequencing : Seperations Simply spectacular [1 July – 30 Aug 2020]

Plant Genome Editing : African Centre for Genetic Technologies [3-5 Sep. 2019]

Basic laboratory Techniques : Agricultural Research Council [8-12 May 2019]

Habitable planet online course : ACCESS [Sept - Nov. 2017]

Import and Export of Agricultural Product Inspection : AQSIQ, People’s Republic of China [1 - 28 Nov. 2016]

and Quarantine

Research Design Method Certificate : Rhodes University [11- 14 April 2016]

National Senior Certificate (Grade 12)  **:** Dingukwazi Senior School [2009]

# SCIENTIFIC SOCIETY MEMBERSHIP

South African Council for Natural Science Profession (SACNASP)

South African Society of Crop Production (SASCP)

# PEER REVIEWED PUBLICATIONS

**Dlamini P.J.,** Schultz-Viljoen T. and Ntuli N. R. *In vitro* mutagenesis and preliminary characterization of potential drought-tolerant sugarcane lines. *Acta Physiologiae Plantarum* (under review). Manuscript number: ACPP-D-20-00955.

**Dlamini P.J.** (2021). Drought stress tolerance mechanisms and breeding effort in sugarcane: a review of progress and constraints in South Africa. *Plant Stress* 1, in press (STRESS-D-20-00053R1).

**Dlamini, P.J**., Schultz-Viljoen, T., and Ntuli, N.R. (2020). Morphological and physiological screening of ethyl methanesulfonate-treated sugarcane calli and plantlets for in vitro mannitol-induced osmotic stress tolerance. *Plant cell biotechnology and molecular biology* 21, 107-120.

# CONFERENCE PRESENTATION

**Dlamini P. J**., Schultz-Viljoen T. and Ntuli N. R. (2020). Ethyl methanesulfonate mutagenesis and in vitro selection procedure for drought stress tolerance in sugarcane. 06 – 11 January 2020. University of Free State, Qwaqwa Campus, Free State, South Africa.

**Dlamini P. J**., Ntuli N. R. and Schultz-Viljoen T. (2019). Impact of EMS treatment on sugarcane callus growth, proline content and cell wall modification during osmotic stress. The 92nd Proceedings of the South African Sugar Technologies Association. 20 – 22 August 2019. Inkosi Albert Luthuli International Convention Centre, Durban, South Africa.

**Dlamini P. J.** and Schultz-Viljoen T. (2018). Characterization of ethyl methanesulfonate treated sugarcane callus for in vitro drought stress selection. 12th South African Plant Breeding Symposium. 11–15 March 2018. Gateway Hotel, Durban, South Africa.

Besten T., **Dlamini P.J**., Fakazi B.H. Mawasha P. T., Mnomiya S. N., Kutu M. W. and Mashabana N. I. (2016). An overview of South African inspection and quarantine of the fresh produce market. Inspection and quarantine of the countries along the 21st maritime silk road. Changzhou, People’s Republic of China

# REFERENCES

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| **CONTACT PERSON** | **DESIGNATION & RELATIONSHIP** | **CONTACT** |
| Dr I. Gazendam | PhD and Plant Biotechnology Mentor at ARC-VOP | +27 (0) 82 394 8034  [igazendam@arc.agric.za](mailto:igazendam@arc.agric.za) |
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| Dr N. R. Ntuli | MSc supervisor at the University of Zululand | +27 (0)78 391 8578  [NtuliR@unizulu.ac.za](mailto:NtuliR@unizulu.ac.za) |