



Plant Sciences - Research outputs 2019

Research articles

Ahmad, T., Cawood, M.E., Iqbal, Q., Ariño, A., Batool, A., Tariq, R.M.S., Azam, M. & Akhtar, S. 2019. Phytochemicals in *Daucus carota* and their health benefits - Review Article. *Foods* 8: 424.

Akinnuoye-Adelabu, D.B., Steenhuisen, S. & Bredenhand, E. 2019. Improving pea quality with vermicompost tea and aqueous biochar: Prospects for sustainable farming in Southern Africa. *South African Journal of Botany* 123: 278-285.

Amah, D., Alamu, E., Adesokan, M., van Biljon, A., Maziya-Dixon, B., Swennen, R. & Labuschagne, M. 2019. Variability of carotenoids in a *Musa* germplasm collection and implications for provitamin A biofortification. *Food Chemistry X* 2: 100024.

Amah, D., van Biljon, A., Brown, A., Perkins-Veazie, P., Swennen, R. & Labuschagne, M. 2019. Recent advances in banana (*Musa* spp.) biofortification to alleviate vitamin A deficiency. *Critical Reviews in Food Science and Nutrition* 59: 3498-3510.

Amah, D., van Biljon, A., Maziya-Dixon, B., Labuschagne, M. & Swennen, R. 2019. Effects of *in vitro* polyploidization on agronomic characteristics and fruit carotenoid content; Implications for banana genetic improvement. *Frontiers in Plant Science* 10: 1450.

Birkenfeld, M., Horwitz, L.K., Bar-Yosef Mayer, D.E., Bond, J., Guttmann-Bond, E., Cummings, L.S., Goldgeier, H., Krakovsky, M., Natalio, F., Nebenhaus, K., Neumann, F.H., Porat, N., Scott, L., Simmons, T., Yashuv, T. & Avner, U. 2019. Investigations at Nahal Roded 110: a Late Neolithic ritual site in the southern Negev. *Antiquity* 93 (367) (e4), 1-8. <https://doi.org/10.15184/aqy.2019.6>

Birkhofer, K., Addison, M.F., Arvidsson, F., Bazelet, C., Bengtsson, J., Booyesen, R., Conlong, D., Haddad, C., Janion-Scheepers, C., Kapp, C., Lindborg, R., Louw, S., Malan, A.P., Storey, S.G., Swart, W.J. & Addison, P. 2019. Effects of ground cover management on biotic communities, ecosystem services and disservices in organic pome fruit orchards in South Africa. *Frontiers in Sustainable Food Systems* 3: 107.

Boshoff, W.H.P., Bender, C.M. & Pretorius, Z.A. 2019. Reaction of South African rye, triticale and barley forage cultivars to stem and leaf rust. *South African Journal of Plant and Soil* 36(2): 77-82.



Boshoff, W.H.P., Bender, C.M. & Pretorius, Z.A. 2019. The value of field ratings of differential lines for pathotyping *Puccinia graminis* f. sp. *tritici*. *European Journal of Plant Pathology* 155(1): 349-352.

Boshoff, W.H.P., Prins, R., De Klerk, C., Krattinger, S.G., Bender, C.M., Maree, G.J., Rothmann, L. & Pretorius, Z.A. 2019. Point inoculation method for measuring adult plant response of wheat to stripe rust infection. *Plant Disease* 103(6): 1228-1233.

Boshoff, W.H.P., Visser, B., Terefe, T. & Pretorius, Z.A. 2019. Diversity in *Puccinia graminis* f. sp. *avenae* and its impact on oat cultivar response in South Africa. *European Journal of Plant Pathology* 155: 1165-1177.

Buwa-Komoreng, L.V., Mayekiso, B., Mhinana, Z. & Adeniran, L.A. 2019. An ethnobotanical and ethnomedicinal survey of traditionally used medicinal plants in Seymour, South Africa: an attempt towards digitization and preservation of ethnic knowledge. *Pharmacognosy Magazine* 14: 115-123.

Carrión, J.S., Scott, L. & deMenocal, P. 2019. Paleofloras, paleovegetation and human evolution. *Review of Palaeobotany and Palynology* 267: 32-38.

Chirango, Y., Steenhuisen, S., Bruyns, P.V., Midgley, J.J. & Shuttleworth, A. 2019. The March fly and the ant: the unusual pollination system of *Eustegia minuta* (Apocynaceae: Asclepiadoideae). *Arthropod-Plant Interactions* 13(5): 745-755.

Cordova, C.E., Kirsten, K.L., Scott, L., Meadows, M.E. & Lücke, A. 2019. Multi-proxy evidence of Late-Holocene paleoenvironmental change at Princessvlei, South Africa: The effects of fire, herbivores, and humans. *Quaternary Science Reviews* <https://doi.org/10.1016/j.quascirev.2019.105896>.

Cozien, R., van der Niet, T., Johnson, S.D. & Steenhuisen, S. 2019. Saurian surprise: lizards pollinate South Africa's enigmatic 'hidden flower'. *Ecology* 100(6): e02670.

Crous, P.W., Wingfield, M.J., Lombard, I., Roets, F., Swart, W.J., et al., 2019. Fungal Planet Description Sheets: 951-1041. *Persoonia* 43: 223-425.

Engelbrech, F.A., Marean, C.W., Cowling, R., Engelbrecht, C., Nkoana, R., O'Neal, D., Fisher, E., Shook, E., Franklin, J., Neumann, F.H., Scott, L., Thatcher, M., McGregor, J.L., van der Merwe, J., Dedekind, Z. & Difford, M. 2019. Downscaling Last Glacial Maximum climate over southern Africa. *Quaternary Science Reviews* 226: 105879.



Galindo, A.C., López, J.O., Munguía, A.R., Inungaray, M.L.C., Cawood, M., Pérez, G.M., Luqueño, F.F. & Montiel, R.G.C. 2019. Influence of bioactive compounds incorporated in a nanoemulsion as coating on avocado fruits (*Persea americana*) during postharvest storage: Antioxidant activity, physiochemical changes and structural evaluation. *Antioxidants* 8: 500.

Gerrano, A.S., Jansen van Rensburg, W.S., Shargie, N.G., Amelework, B.A., Shimelis, H.A. & Labuschagne, M.T. 2019. Selection of cowpea collections based on grain minerals and protein composition. *Acta Agriculturae Scandinavica, Section B - Plant Soil Science* 69: 155-166.

Greeff-Laubscher, M.R., Beukes, I., Marais, G.J. & Jacobs, K. 2019. Mycotoxin production by three different toxigenic fungi genera on formulated abalone feed and the effect of an aquatic environment on fumonisins. *Mycology* DOI: 10.1080/21501203.2019.1604575 (ISSN 2150-1203).

Grímsson, F., Shirley Graham, S., Coiro, M., Jacobs, B.F., Xafis, A. Neumann, F., Scott, L., Currano, E.D. & Zetter, R. 2019. Origin and divergence of Afro-Indian Picrodendraceae: linking pollen morphology, dispersal modes, fossil records, molecular dating and paleogeography. *Grana* 10.1080/00173134.2019.1594357.

Hiscock, L., Bothma, C., Hugo, A., van Biljon, A. & Jansen van Rensburg, W.S. 2019. Hedonic evaluation and check-all-that-apply (CATA) question for sensory characterisation of stewed vegetable *Amaranthus*. *Journal of Food Sciences and Technology* DOI.10.1007/s13197-019-04073-1.

Jordaan, E., van der Waals, J.E. & McLaren, N.W. 2019. Effect of irrigation on charcoal rot severity, yield loss and colonization of soybean and sunflower. *Crop Protection* 122: 63-69.

Li, F., Upadhyaya, N.M., Sperschneider, J., Matny, O., Nguyen-Phuc, H., Mago, R., Raley, C., Miller, M.E., Silverstein, K.A.T., Henningsen, E., Hirsch, C.D., Visser, B., Pretorius, Z.A., Steffenson, B.J., Schwessinger, B., Dodds, P.N. & Figueroa, M. 2019. Emergence of the Ug99 lineage of the wheat stem rust pathogen through somatic hybridisation. *Nature Communications* 10: 5068.

Li, H., Boshoff, W.H.P., Pretorius, Z.A., Zheng, Q., Li, B. & Li, Z. 2019. Establishment of wheat *Thinopyrum ponticum* translocation lines with resistance to *Puccinia graminis* f. sp. *tritici* Ug99. *Journal of Genetics and Genomics* 46: 406-407.

Manjeru, P., van Biljon, A. & Labuschagne, M.T. 2019. The development and release of maize fortified with provitamin A carotenoids in developing countries. *Critical Reviews in Food Science and Nutrition* 59(8): 1284-1293.



Manjeru, P., van Biljon, A., MacRobert, J. & Labuschagne, M.T. 2019.

Provitamin A maize hybrid response to drought, heat, low nitrogen and low phosphorous stress. *Crop Science* 59: 2533-2543.

Maree, G.J., Prins, R., Bender, C.M., Boshoff, W.H.P., Negussie, T.G. & Pretorius, Z.A. 2019. Phenotyping Kariega x Avocet S doubled haploid lines containing individual and combined adult plant stripe rust resistance loci. *Plant Pathology* 68(4): 659-668.

Maree, G.J., Prins, R., Boyd, L.A., Castelyn, H.D., Bender, C.M., Boshoff, W.H.P. & Pretorius, Z.A. 2019. Assessing the individual and combined effects of QTL for adult plant stripe rust resistance derived from Cappelle-Desprez. *Agronomy* 154(9): article 154, 13pp.

Mbuma, N.W., Zhou, M.M. & Van der Merwe, R. 2019. Comparing family with individual genotype breeding parameters for cane yield in sugarcane populations. *South African Journal of Plant and Soil* 36(1): 11-19.

Mbuma, N.W., Zhou, M.M. & Van der Merwe, R. 2019. Evaluating parents for cane yield in sugarcane breeding using best linear unbiased prediction analysis of progeny data derived from family plots. *South African Journal of Plant and Soil* 36(1): 21-28.

Ollerton, J., Liede-Schumann, S., Endress, M.E., Meve, U., Rech, A.R., Shuttleworth, A., Keller, H.A., Fishbein, M., Alvarado-Cárdenas, L.O., Amorim, F.W., Bernhardt, P., Celep, F., Chirango, Y., Chiriboga-Arroyo, F., Civeyrel, L., Cocucci, A., Cranmer, L., da Silva-Batista, I.C., de Jager, J.C.L., Deprá, M.S., Domingos-Melo, A., Dvorsky, C., Agostini, K., Freitas, L., Gaglianone, M.C., Galetto, L., Gilbert, M., González-Ramírez, I., Gorostiague, P., Goyder, D., Hachuy-Filho, L., Heiduk, A., Howard, A., Ionta, G., Islas-Hernández, S.C., Johnson, S.D., Joubert, L., Kaiser-Bunbury, C.N., Kephart, S., Kidyoo, A., Koptur, S., Koschnitzke, C., Lamborn, E., Livshultz, T., Machado, I.C., Marino, S., Mema, L., Mochizuki, K., Morellato, L.P.C., Mrisha, C.K., Muiruri, E.W., Nakahama, N., Nascimento, V.T., Nuttman, C., Oliveira, P.E., Peter, C.I., Puneekar, S., Rafferty, N., Rapini, A., Ren, X., Rodríguez-Flores, C.I., Rosero, L., Sakai, S., Sazima, M., Steenhuisen, S., Tan, C., Torres, C. Trøjelsgaard, K., Ushimaru, A., Vieira, M.F., Wiemer, A.P., Yamashiro, T., Nadia, T., Queiroz, J. & Quirino, Z. 2019. The diversity and evolution of pollination systems in large plant clades: Apocynaceae as a case study. *Annals of Botany* 132(2): 311-325.

Pretorius, Z.A., Booysen, G.J., Boshoff, W.H.P., Joubert, J.H., Maree, G.J. & Els, J. 2019. Additive manufacturing of devices used for collection and application of cereal rust urediniospores. *Frontiers in Plant Science* 10, article 639, doi: <https://doi.org/10.3389/fpls.2019.00639>



Ramulifho, E., Goche, T., Van As, J., Tsilo, T.J., Chivasa, S. & Ngara, R. 2019. Establishment and characterization of callus and cell suspension cultures of selected *Sorghum bicolor* (L.) Moench varieties: a resource for gene discovery in plant stress biology. *Agronomy* 9(218):

doi:10.3390/agronomy9050218.

Santchurn, D., Badaloo, M.G.H., Zhou, M.M. & Labuschagne, M.T. 2019. Contribution of sugarcane crop wild relatives in the creation of improved varieties in Mauritius. *Plant Genetic Resources* 17: 151-163.

Santchurn, D., Badaloo, M.G.H., Zhou, M.M. & Labuschagne, M.T. 2019. Genetic studies on sugar and fibre accumulation patterns among different types of energy canes in Mauritius. *SugarTech* 21: 879890.

Saunders, D.G.O., Pretorius, Z.A. & Hovmøller, M.S. 2019. Tackling the re-emergence of wheat stem rust in Western Europe. *Communications Biology* 2: 51.

Scott, L., van Aardt, A.C., Brink, J.S., Toffolo, M.B., Ochando, J. & Carrion, J.S. 2019. Palynology of Middle Stone Age spring deposits in grassland at the Florisbad hominin site, South Africa. *Review of Palaeobotany and Palynology* 265: 13-26.

Sobol, M., Scott, L. & Finkelstein, S. 2019. Reconstructing biome states using machine language and modern pollen assemblages: a case study from Southern Africa. *Quaternary Science Reviews* 212: 117.

Terefe, T., Pretorius, Z.A., Visser, B. & Boshoff, W.H.P. 2019. First report of *Puccinia graminis* f. sp. *tritici* race PTKSK, a variant of wheat stem rust race Ug99 in South Africa. *Plant Disease* 103(6): 1421.

Thackeray, J.F., Scott, L. & Pieterse, P. 2019. The younger dryas interval at Wonderkrater (South Africa) in the context of a platinum anomaly. *Palaeontologia africana* 54: 30-35.

Tóth, B. & Moloi, M.J. 2019. The use of industrial waste materials for alleviation of iron deficiency in sunflower and maize. *International Journal of Recycling of Organic Waste in Agriculture* 8: 145-151.

Tóth, B., van Biljon, A., Moloi, J. & Labuschagne, M. 2019. Effects of different fertilization levels on the concentration of high molecular weight-glutenin subunits of two spring, hard red bread wheat cultivars. *Cereal Chemistry* 96: 1004-1010.

Venter, S.L., Fouche, H.J., de Wit, M., Mavengahama, S., Coetzer, G., Swart, W.J. & Amonsou, E.O. 2019. The effect of fostering partnerships on broadening the food base: The role of cactus pear, an underutilised crop with unlimited potential and the South African Perspective. *ISHS Acta Horticulturae* 1247: *IX International Congress on Cactus Pear and Cochineal*: CAM Crops for a Hotter and Drier World, pp 237-244.



Visser, B., Meyer, M., Park, R., Gilligan, C., Burgin, L.E., Hort, M.C., Hodson, D. & Pretorius, Z.A. 2019. Microsatellite analysis and urediniospore dispersal simulations support the movement of *Puccinia graminis* f. sp. *tritici* from southern Africa to Australia. *Phytopathology* 109: 133-144

Wessels, E., Prins, R., Boshoff, W.H.P., Zurn, J.D., Acevedo, M. & Pretorius, Z.A. 2019. Mapping a resistance gene to *Puccinia graminis* f. sp. *tritici* in the bread wheat cultivar Matlabas. *Plant Disease* 103(9): 2337-2344.

Yekelo, N., Rothmann, L., Bender, C.M., Pretorius, Z.A. & Boshoff, W.H.P. 2019. Response of an international triticale collection to *Puccinia triticina* and *Puccinia recondita* and assessment of temperature sensitivity in leaf rust isolates. *Cereal Research Communications* 47(3): 496-505.

Books/Chapters in Books

Igrejas, G., Labuschagne, M.T., Ruiz, M., Rogers, J. & Morris, C. 2019. Durum wheat storage protein composition and the role of LMW-GS in quality. In: *Wheat quality for improving processing and human health*. Igrejas, G., Ikeda, T. & Guzman, C. (eds.). Springer.

Labuschagne, M.T. & Igrejas, G. 2019. Proteomics as a tool in gluten protein research. In: *Wheat quality for improving processing and human health*. Igrejas, G., Ikeda, T. & Guzman, C. (eds.). Springer.

Marais, G.J. 2019. Fungal diseases associated with pecans in South Africa: a field guide. Xerox, Bloemfontein, South Africa.

Mwenye, O.J., Van Rensburg, L., Van Biljon, A. & Van der Merwe, R. 2019. Seedling shoot and root growth responses among soybean (*Glycine max*) genotypes to drought stress. In: *Soybean biomass, yield and productivity*. Kasai, M. (ed.). Intechopen Limited.

UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA



UFS
NATURAL AND
AGRICULTURAL SCIENCES

Research reports

Boshoff, W.H.P. 2019. *Evaluation of wheat cultivars and lines for genetic resistance to rust diseases*. Report delivered to the Winter Cereal Trust.

Boshoff, W.H.P. 2019. *Genomics for resistance*. Report delivered to King Abdullah University of Science and Technology (KAUST) as part of the project: "State-of-the-Art Genomics to Understand Durable Disease Resistance in Wheat and Barley".