WORMS FOR PEST CONTROL?

Dr Tiisetso Lephoto's fight to protect SA's crops

South African farmers and the agricultural sector are increasingly struggling with insect pest control due to the growing problem of pesticide resistance. But Dr Tiisetso Lephoto has a plan – worms.

According to the Food for Mzansi website, farmers are facing a growing problem – pests are becoming resistant to pesticides. PreventionWeb reports that the challenge of insect pest control poses a threat to food security. "Insect pests could cut crop production by 25–40%, if not well managed. Climate change is fuelling an upsurge of crop pests in Sub-Saharan Africa". This challenge threatens crop production, forcing farmers to adopt new solutions such as Integrated Pest Management (IPM) strategies. According to the United States Environmental Protection Agency website, IPM is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. "IPM programmes use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment".

Dr Tiisetso Lephoto is passionate about science, agriculture and innovation. She has expertise in insect pest control and management on farms and in agricultural industries. Lephoto discovered indigenous microscopic worms that can infect and kill problematic soil-dwelling insects within 24–48 hours of invasion.

She is a multi-award-winning, trailblazing scientist with published papers in national and international journals. She has successfully supervised over 30 postgraduate (PhD, MSc and BSc Honours) students in the School of Molecular and Cell Biology at the University of the Witwatersrand (Wits). Through her Nematech Biosciences Foundation, and with the support of the Department of Science, Technology and Innovation (DSTI), she assists in the mentorship of more than 200 graduates.

Lephoto is a Lecturer and Principal Researcher and received the prestigious 2024 TW Kambule-NSTF Award: Emerging Researcher in the NSTF-South32 Awards, known as the 'Science Oscars' of South Africa.

She harnesses the power of entomopathogenic nematodes – microscopic worms with a lethal talent for dispatching insect pests. Her work is at the forefront of a global shift towards sustainable, environmentally friendly pest control methods, namely biological control agents (natural enemies for pests), which promise to

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Dr Tiisetso Lephoto (right) holding her award, which was proudly handed to her by Minister of Science, Technology and Innovation, Dr Blade Nzimande (left).

reshape agricultural practices across South Africa and beyond. By applying cutting-edge techniques, like whole genome sequencing and transcriptome analysis, Lephoto is unlocking the genetic secrets behind these nematodes' remarkable abilities.

Lephoto was born and raised in Soweto, and her parents supported her when, at just five years old, she expressed a desire to grow her own fruit and vegetables. "I watched my crops grow with great excitement, but soon experienced a problem with pests," she recalls. "I became determined to be a scientist, for the sake of my garden, my community and the world."

Lephoto hopes her winning of the NSTF-South32 Award will encourage aspiring young scientists to persevere and reach their dreams.

"There may be people who tell you that you are too ambitious, you're not capable and you won't make it. Believe in the power of your potential and remember why you started. Ignore the noise and focus on what matters — yourself, and your contribution to science."

For more information on careers in science, technology, engineering and mathematics (STEM), refer to the STEMulator.org and the STEMulator Career Booklet. If you are interested in food and agricultural sciences, have a look at: Agronomist (p5); Biologist (p10); Botanist (p11); Chemical Engineer (p12); Geneticist (p23); Microbiologist (p30); Nematologist (p31); and Zoologist (p46).

Article written by Barnard Manne, Media Liaison and Communications Manager at the National Science and Technology Forum (NSTF).

Balemi ba Afrika Borwa le lefapha la temo ba lebane le mathata a go laola dikhunkhwane ka lebaka la go se sa šoma ga dihlare tša di-pesticide. Eupša Dr. Tiisetso Lephoto o na le leano—diboko tše dinnyane. O šomiša matla a tšona go fediša dikhunkhwane ka tsela ya tlhago.

Translated into North Sotho by Prof. Walter Matli