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Grass research to alleviate possible adverse climate changes

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A research team has been travelling through the country to find three grass species that could be significant in long-term efforts to alleviate expected adverse climatological conditions due to climate change. The species are *Eragrostis nindensis*, *Oropetium capense* and *Microchloa caffra*.

The project is a collaboration between members of the [University of Illinois](#) and the [University of Cape Town](#).

According to Dr Rose Marks, [assistant professor in Plant Biology at the University of Illinois](#), they focus on resurrection grasses, meaning grasses that can survive without any water. The study aims to understand the natural diversity of these three species across the entire country. These species are significant because of their ability to survive without water, making its tissue fully desiccation tolerant.



Dr Rose Marks, incoming assistant professor in Plant Biology at the University of Illinois, makes notes during a fieldwork excursion.

“What is interesting,” she says, “is that these species not only occur in arid regions but also high-rainfall areas such as the Escarpment. Among other things, this study is aimed at trying to understand if plants occurring in high-rainfall areas have lost some of their hardiness, or conversely, when in the arid regions, have gained some hardiness traits. Once we understand the plants better, we want to look at how we can leverage these traits to breed or engineer more drought-tolerant crops.”

Dr Llewelyn van der Pas, a post-doctoral researcher at the University of Cape Town’s Department of Molecular and Cell Biology, explains that the research has two main aspects: studying the plants and their unique traits, and investigating the soil microbes and their interactions with these plants.

“As we gather plant specimens,” he explains, “we also focus on preserving the soil surrounding the roots, so we can identify and isolate bacteria and fungi that may have co-evolved with these species and possibly could play a role in boosting productivity in other crops. Being a multi-disciplinary research team, we can do comparisons of both above and below ground, involving not only the plants themselves but also their immediate below-soil environment.”

[Read more about the Southern African grass identifying app here.](#)

Next steps

“Several steps still have to be taken in the research,” says Dr Marks. “First, we must bring all the specimens back to the greenhouse and cultivate them, harvest seeds and do detailed phenotyping to compare drought tolerance. We will also conduct a range of genetic and genomic analyses to figure out what genes they are expressing and what genetic variation they have that might contribute to increasing or decreasing their resilience.”

“The same applies to the study of the microbes,” says Dr Van der Pas. “It will involve a lot of culturing, trying to isolate unique organisms, DNA sequencing and possibly generating an inoculum that could enhance the hardiness of crops such as maize, wheat and even teff.”

“Although a scientific paper on this research might be published within a year or two,” Dr Marks concludes, “in terms of finding a key gene and improving grain crops to become desiccation tolerant, this could take a whole career’s work.” – *Izak Hofmeyr, Plaas Media*

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