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The potential of fragipans in sustaining pearl millet during drought periods in north-central Namibia

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Author(s) Prudat, Brice; Fister, Wolfgang; Bloemertz, Lena; Krenz, Juliane; Kuhn, Niklaus J.

Author(s) at UniBasel [Fister, Wolfgang](#) ; [Kuhn, Nikolaus J.](#) ; [Krenz, Juliane](#) ; [Vos, Heleen Cornelia](#) ;

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Sandy soils with fragipans are usually considered poorly suited for agriculture. However, these soils are cultivated in Namibia as they can secure a minimum harvest during droughts. In order to understand the hydrological influence of fragipans in these soils, Ehenge, their soil moisture content was measured for 4 months. These data were then compared to a deep soil without fragipan, Omutunda, which is more productive during normal years but less productive during droughts. The results illustrate that the combination of sandy topsoil and shallow fragipan has beneficial effects on plant-available water during dry periods. Three reasons can be determined: (i) high infiltration rate in the sandy topsoil, (ii) prevention of deep drainage by the fragipan, and (iii) limitation of evaporation losses through the sand. Consequently, transferring these findings to other dry, sandy areas with fragipans, with respective consequences on farming practices, crop productivity, and food security, should be possible.

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