Foundational Genomics Research, PMI SFA

U.S. DEPARTMENT OF ENERGY | Office of Science

High Impact Publication: Plant hosts modify the response of the belowground microbial community to extreme drought

Objective	• To understand the role of plants in the response of the soil microbial community to drought and recovery.
New science	• Drought stress from climate change negatively impacts microbial activity, but the magnitude of stress response is likely dependent on above and belowground interactions, such as the beneficial associations between plants and microbes. • We found that root fungal communities shift strongly with drought, while root bacterial communities change to a lesser degree. • We found that the proportion of bacterial OTUs that are enriched under drought conditions (~11%) remains high after re-wetting and recovery in bulk soils but declines over time in soils when plants are present.
Impact	• This study demonstrates that plants modulate soil microbial drought responses via tight plant-microbe linkages during extreme drought conditions.

Fig 1.

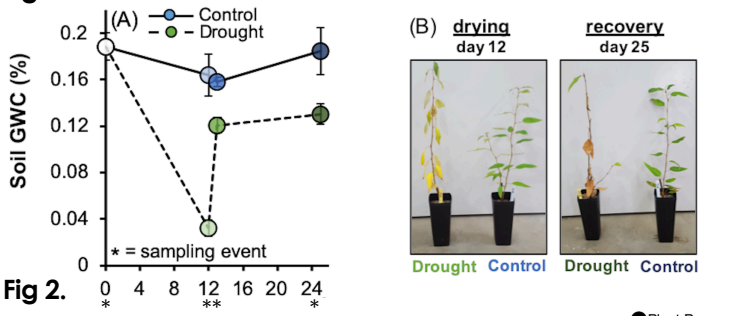
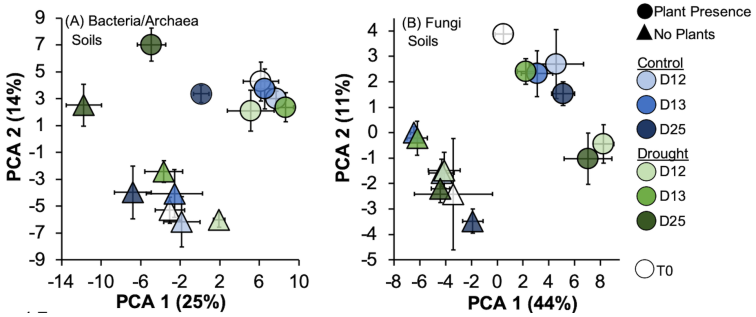


Fig 2.



Soil gravimetric water content (GWC) of irrigated control and drought treatments (1A) which show plants underwent a drought period resulting in significant leaf wilt, a re-wet, and recovery period (1B). Bacterial/archaeal (2A) and fungal (2B) communities vary between planted and bulk soils. Further, drought significantly alters bulk soil bacterial communities (2A).

Plant hosts modify belowground microbial community response to extreme drought
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mSystems, **DOI:** 10.1128/mSystems.00092-20

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