

# Multiple-source characteristics of crop water use strategy in hyper-arid regions

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The shortages of water resources and unsustainable water resource management are more prominent in arid and semi-arid areas. The mismatch between water supply schemes and the characteristics of root

water uptake leads to lower water use efficiency of crops in these regions.

Isotope technology, an accurate, quick, and non-destructive method, can be used to explore water use strategy of plants. Affected by multiple [water sources](#) and hyper-arid climate, the characteristics of root water uptake in crops are extremely complicated in oasis agroecosystems.

Recently, researchers from the Northwest Institute of Eco-Environment and Resources (NIEER) of the Chinese Academy of Sciences (CAS) found that the isotopes in stem water of crops had high similarity to groundwater, [irrigation water](#), and [soil water](#) across consecutive years.

The study was published in *Agricultural Water Management*.

Interestingly, from the jointing stage to the dough stage, the depth of root water uptake in maize was from shallow to deep, but after the dough stage, the depth of root water uptake in maize was from deep to shallow.

"The depth of root water uptake in crops varied with growth stage, which mainly depends on root activity and [soil moisture](#)," said Prof. Zhang Yongyong, first author of this study.

Affected by various water sources, root water uptake patterns in [crops](#) became complicated with growth stage. The contributions of soil water in 0–20 cm, 20–40 cm, 40–60 cm, and 60–100 cm soil layers to root water uptake in maize were 30%, 12%, 15%, and 43%, respectively. Crops prefer to absorb irrigation water and groundwater in oasis farmlands.

This finding provides a guide for optimizing water use strategies in oasis agroecosystem in hyper-arid regions.

**More information:** Yongyong Zhang et al, Multiple sources characteristics of root water uptake of crop under oasis farmlands in hyper-arid regions, *Agricultural Water Management* (2022). [DOI: 10.1016/j.agwat.2022.107814](https://doi.org/10.1016/j.agwat.2022.107814)

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