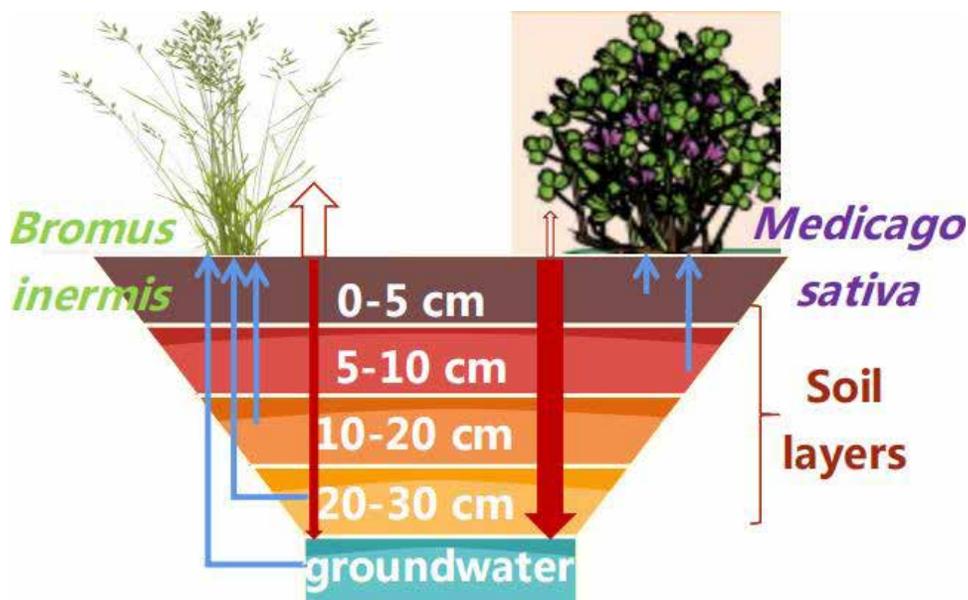


Comparison of Water Use Characteristics Between *Bromus inermis* & *Medicago sativa* for Revegetating Degraded Land in Agro-Pasture Ecotone in North China

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Revegetation with herbaceous plants has been effective in neutralizing land degradation, however, there is limited understanding about the water use characteristics and influences on soil water dynamics of revegetated species for ecological restoration. Hence, the stable isotopic composition of xylem water, soil water and groundwater was measured to investigate the water uptake patterns of *Bromus inermis* and *Medicago sativa* in the semi-arid agro-pasture ecotone in North China. Based on hierarchical clustering analysis, soil was classified into four layers (0-5 cm, 5-10 cm, 10-20 cm and 20-30 cm) as different water sources. The main sources for *Bromus inermis* were from 20-30 cm (27.0%) and groundwater (24.2%) in May, to 0-5 cm (33.9%) and 5-10 cm (26.8%) in June, became groundwater (54.7%) in July, and then to 10-20 cm and 20-30 cm in August (23.2% and 20.6%) and September (35.1% and 32.1%). *Medicago sativa* were from groundwater (52.9%) and 20-30 cm (32.4%) in May, to 0-5 cm in June (61.0%), July (39.9%), August (47.6%), and then to 5-10 cm (77.8%) in September. Regression analysis showed a negative relationship between soil water content (SWC) and contribution of water uptake (CWU) ($\text{CWU} = -2.284 \times \text{SWC} + 60.833$), when the difference in water isotopes was small among soil layers. Finally, the two grassland types showed distinct soil water dynamics shaped by species-specific water use strategies and associated soil pore properties. These results indicate that water use characteristics are species-specific and species combination with less water competition is recommended for sustainable revegetation of degraded land.



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