

## عنوان مقاله:

Root-shoot regulation and yield of mulched drip irrigated maize on sandy soil

## محل انتشار:

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## خلاصه مقاله:

Sandy fields have been reclaimed to exploit the grain production potential in northwest China. A 2-year statistically replicated field study was conducted to determine the effects of mulched drip irrigation on soil water, soil nitrate, shoot root growth and yields of maize on a sandy field in the Hetao irrigation district. Treatments included border irrigation (BI), fully mulched drip irrigation (FMDI) and partially mulched drip irrigation (PMDI). Low frequency fertigation and high frequency fertigation were applied in 2014 and 2015, respectively. The results showed that high frequency mulched drip irrigation (MDI) maintained soil moisture and  $\text{NO}_3\text{-N}$  at suitable levels and improved soil water uniformity (Cus). Soil  $\text{NO}_3\text{-N}$  was adequate for the FMDI treatment of both high and low frequency fertigations, but it was insufficient for the PMDI treatment under low frequency fertigation. Soil water and Cus regulated root-shoot via leaf areas and surface root areas were described well by the ratio of root surface area to leaf area (Sr/l). Higher Cus tended to cause a lower Sr/l. Compared with the BI treatment, a higher yield and harvest index (HI) was obtained under the MDI treatments primarily due to the high number of grains per spike. The FMDI and PMDI treatments resulted in no yield differences under high frequency fertigation. Therefore, high frequency PMDI management with irrigation amounts based on the reference evapotranspiration after the jointing stage were recommended in the sandy maize field based on economic considerations. Under low frequency fertigation, the FMDI treatment was recommended for a higher yield, which was attributable to the higher dry matter of the vegetative organs and maintaining higher levels of soil  $\text{NO}_3\text{-N}$  in the upper sand layer when compared to the PMDI treatment.

## کلمات کلیدی:

Soil water uniformity, Harvest index, Mulched drip irrigation, Shoot-root regulation, Sand-layered soil

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