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Title:	Paclobutrazol improves surface water use efficiency by regulating allometric trait behavior in maize
Authors:	Satbhai, Santosh B. (/jspui/browse?type=author&value=Satbhai%2C+Santosh+B.)
Keywords:	Paclobutrazol improves surface allometric trait
Issue Date:	2022
Publisher:	Elsevier
Citation:	Chemosphere, 307(1), 2-13.
Abstract:	<p>Paclobutrazol (PBZ) role in drought management of maize is least understood. In maize, root traits are linked with surface water management. Over three years, early and terminal deficit irrigation (EDI and TDI) with or without PBZ were imposed on DKC-9144 and PG-2475 maize varieties. Several allometric parameters viz. stem height, stem diameter, leaf area and root traits along with physiological processes were measured. Implication of these parameters in the management of soil surface irrigation in terms of water use efficiency (WUE) was demonstrated in maize. Increased number of lateral roots and root number density in DKC-9144 provided more surface area for water absorption for better management of EDI. Root growth rates showed a similar pattern with root length, root surface areas, and root numbers in EDI. Elevated expressions of ZmRTCL, ZmRTCS and ZmARF34 in EDI and EDI plus PBZ were associated with seminal roots and root laterals initiation. Under TDI alone or in combination with PBZ, root lengths (BRL, CRL, SRL) and root surface areas varied in DKC-9144 and PG-2475 over control. Furthermore, correlation analysis showed that decrease in WUE under TDI was significantly associated with a reduction in stem thickness and leaf surface area. For WUE_N in TDI and PBZ plus TDI, structural equation modelling proposed, brace root surface area (BRSA_N) as a positive contributor, while a negative contributor was seminal root surface area (SRSA_N). Present study explained the importance of specific root traits and their association with other allometric parameters for improving WUE in DKC-9144 variety of maize and the crop in general.</p>
Description:	Only IISERM authors are available in the record
URI:	https://doi.org/10.1016/j.chemosphere.2022.135958 (https://doi.org/10.1016/j.chemosphere.2022.135958) http://hdl.handle.net/123456789/4697 (http://hdl.handle.net/123456789/4697)
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