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BENEFICIAL EFFECTS OF STRUCTURED WATER AND PINK PIGMENTED FACULTATIVE METHYLOTROPHS FOR GROWTH, YIELD AND QUALITY OF IRRIGATED COTTON

Authors: NALAYINI PERIYAKARUPPAN'

Institutions: ICAR - CENTRAL INSTITUTE FOR COTTON RESEARCH REGIONAL STATION (MARUTHAMALA MAIN ROAD, COIMBATORE 641003)

Abstract:

Water flowing from mountains Into river is known to be the purest water and is conditioned by the vortexes formed along its path. Structured water devise is said to create similar effect to water, it breaks up large low energy water molecule clusters into smaller high energy clusters. This gives water a lower surface tension and better hydrating properties. The structured water is different from bulk water and contains more oxygen (Pollack, 2013). **The structured water devise marketed by Crystal Blue India based at Mysore, India was used in this study and the bore well water passed through this device is termed as structured water**. The experiment was conducted consecutively for two years of 2014-15 and 15-16 cropping season (August-February) at Central Institute for Cotton Research, Regional Station, Coimbatore to study the influence of structured water and bioinoculants for cotton crop. The design used was split plot design with five replications. The irrigation treatments, structured water irrigation and bore well water irrigation were assigned to the main plot with four bioinoculant treatments in the sub plot viz, seed treatment of Azospirillum, Phosphorus Solubilising bacterial and PPFM each 20g/kg of seeds), Seed dressing +soil application +foliar application of PPFM at 1 concentration twice during flowering to boil development stages were compared with uninoculated control. The soil of the experimental soil was low in Nitrogen, Medium in Phosphorus and high in Potassium. The structured water irrigated cotton were taller in stature, produced more number of leaves, higher chlorophyll , root cation exchange capacity, nutrient uptake and accumulated higher dry matter production. **The structured water irrigated cotton produced significantly higher boll numbers (49.9/plant) as against borewell Irrigated cotton (40.1 boils/plant). The boll weight also higher (6.83 g/boll) as against 5.66g/boll under bore well irrigation. The enhancement in bolls/plant and boll weight was reflected in seed cotton yield as evidenced from 3173 kgs being recorded under structured water as against 2836 kgs in bore well water irrigation. The fiber quality attributes were better with structured water irrigation.** Among the biolnoculants, the subplot treatment which received PPFM as foliar spraying at 1 concentration twice during flowering to boll development stages combined with seed dressing and soil application influenced the boll numbers significantly over seed dressing alone or seed dressing + soil application. The boll numbers across the irrigation treatments was 41.3 under uninoculated control as compared to 45.1 bolls which received PPFM as foliar spraying combined with seed treatment and soil application of bioinoculants and the yield trend followed as that of bolls/plant with 9.5 enhanced yield over uninoculated treatment. Pink Pigmented Facultative Methylotrophs (PPFM) influences seed germination and seeding growth by producing plant growth regulators like Zeatin and related cytokinins (Holland and Polacca, 1994) Compatible with other bioinoculants (Senthilkumar et al .. 2002) and bioagents (Nalayinl et al, 2004) and PPFM could be explored as a potentioal bioinoculant for cotton nutrition (Nalayini et al., 2010). This study confirmed the beneficial effects of structured water and foliar supplied PPFM for cotton crop.

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