

Growth and yield attributes of summer pearl millet (*Pennisetum glaucum* L.) as influenced by irrigation, mulches and antitranspirant

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SUMMARY

An experiment was conducted during the summer season of the year 2007 and 2008 to study the “Effect of irrigation, mulches and antitranspirant on growths and yield of summer pearl millet (*Pennisetum glaucum* L.) under south Saurashtra conditions”. Among different irrigation scheduling treatments, treatment I₃ (1.0 IW : CPE ratio), being at par with treatment I₂ (0.8 IW : CPE ratio), recorded significantly higher values for yield attributes viz., plant height, number of effective tillers plant⁻¹, leaf area index, length and girth of earhead, grain weight plant⁻¹, test weight and grain yield. While, significantly the lowest values of these attributes were observed under treatment I₁ (0.6 IW : CPE ratio). Treatment M₂ (groundnut shell mulch) recorded significantly higher values for growth and yield attributes and grain yield over treatment M₀ (control). However, treatment M₂ was remained at par with treatment M₁ (wheat cut straw mulch). Application of 6 % kaolin spray (AT₁) recorded significantly the highest values for growth and yield attributes and grain yield as compared to control treatment (AT₀) except number of effective and non effective tillers plant⁻¹ and harvest index.

Key words : Irrigations, Mulches, Antitranspirant, Pearl millet

Agricultural system being basically a photosynthetic one, availability of water is the major motive factor and hence it must be assessed for its efficiency in terms of both primary productivity and useful end products. Moreover, water plays a vital role in the metabolic processes of the plant and therefore, it has a great impact on growth, development and productivity. Thus, water is considered as an elixir of plant life.

Summer cultivation of pearl millet particularly in the irrigated areas of Gujarat State has got importance because of the assurance of targeted crop yield. Irrigation in summer pearl millet is one of the major inputs of crop production. The research work on various agronomic aspects have been undertaken for pearl millet crop. But, the information regarding water requirement and irrigation scheduling as well as the use of mulches and antitranspirant for summer pearl millet crop is lacking for the medium black soils of south Saurashtra agroclimatic zone. Therefore, the present experiment was conducted during the summer seasons of the years 2007 to 2008 to study the “Effect of irrigation, mulches and antitranspirant on growth and yield of summer pearl millet (*Pennisetum glaucum* L.) under south Saurashtra conditions”.

MATERIALS AND METHODS

A field experiment was conducted during summer seasons of 2007 and 2008 at the Instructional Farm, College of Agriculture, Junagadh Agricultural University, Junagadh. The texture of the experimental soil was silty clay with bulk density 1.33 mg/m, field capacity 47 %, wilting point 20 %, pH 7.7, electrical conductivity 0.56 dS m⁻¹ and organic carbon content 0.69 %. The experiment was laid out in split-split plot design with four replications. Treatments comprised of 3 irrigation levels [0.6 IW: CPE ratio (I₁), 0.8 IW: CPE ratio (I₂), 1.0 IW: CPE ratio (I₃)] in main plots, 3 mulching levels [control (M₀), wheat cut straw @ 5 t ha⁻¹ (M₁) and groundnut shell @ 5 t ha⁻¹ (M₂)] and 2 antitranspirant levels [control (AT₀) and : 6 % Kaolin spray at 20 and 50 DAS (AT₁)] in sub-sub plots. Pearl millet variety GHB-558 was sown by drilling on February 9, during both the years 2006 and 2007 at row spacing of 45 cm with seed rate of 3.5 kg ha⁻¹. Crop was fertilized with 60-60-0 NPK kg ha⁻¹ as basal before sowing and 60 kg N ha⁻¹ was applied in two equal splits at an interval of 35-40 days after sowing during both the seasons of experimentation.

The irrigation treatments were imposed after a common irrigation of 50 mm depth. The mulches were applied at 35 days after sowing of the crop in the respective treatments, leaving the pearl millet rows open. Water spray as a control treatment (AT₀) and 6 % kaolin (AT₁) were sprayed on the crop plants at 20 and 50 days after sowing of the crop during both the years. The kaolin @ 600 l ha⁻¹ solution was applied with a hand operated knapsack

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