

## Influence of irrigation schedules, mulches and antitranspirant on growth and yield of summer transplanted pearl millet (*Pennisetum glaucum* L.)

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### ABSTRACT

The field experiment was conducted on pearl millet during summer seasons of the year 2006 and 2007 with three levels of irrigation schedules (0.7, 0.9 and 1.1 IW : CPE ratio), mulches (Control, Pearl millet Bhusha @ 5 t ha<sup>-1</sup> and White plastic sheet, 200 gauge) and two levels of antitranspirant (control and 6% kaolin spray at 20 and 50 DATP). Irrigation scheduled at 1.1 IW : CPE ratio recorded significantly higher values for growth, yield attributes, grain and fodder yield of pearl millet. The increase in grain yield under 1.1 IW : CPE ratio was to the tune of 18.2 % and 4.6 % over 0.7 and 0.9 IW : CPE ratios, respectively. Mulching with white plastic sheet was found best over control followed by pearl millet Bhusha @ 5 t ha<sup>-1</sup>. Among the mulches 13.2 % increase was observed under white plastic sheet over control. Also application of 6% kaolin antitranspirant found remunerative and increased the 9.7 % grain yield over control.

**KEY WORDS :** Pearl millet, Irrigation, Mulch, Antitranspirant, Yield

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### INTRODUCTION

Pearl millet (*Pennisetum glaucum* L.) is one of the major cereal crop grown in the arid and semi arid regions of the world. In India, the total area under pearl millet cultivation was 6.79 million hectares with total production of 5.56 million tones and average productivity of 972 kg ha<sup>-1</sup> during the year 2005 (Anonymous, 2006b). The total area under pearl millet cultivation in Gujarat was 7.7 lakh hectares with average productivity of 1414 kg ha<sup>-1</sup> and area under summer pearl millet was 1.71 lakh hectares with average productivity of 2145 kg ha<sup>-1</sup> in the Gujarat state during the year 2005 (Anonymous, 2006a). In summer season, water is the limiting factor and costly input for crop production for arid and semi arid tropics. Summer cultivation of pearl millet particularly in irrigated areas of Gujarat states has got importance because of assured yield. Pearl millet production in summer season is greatly influenced by irrigation. Among different approaches to schedule irrigation, climatological approach

based on the ratio between irrigation water (IW) and cumulative pan evaporation (CPE) was found the most appropriate, as it integrates all the weather parameters giving their natural waitage in a given soil-water plant continuum. More practicable approaches based on the ratio of a fixed amount of irrigation water (IW) to cumulative pan evaporation (CPE) have been adopted (Parihar *et al.*, 1974). Mulches maintain soil water status by reducing evaporation, runoff and weeds. The adequate supply of moisture increased growth and dry matter production of crops directly as well as indirectly. Application of mulches on the soil surface obstructs the solar radiation inducing into the soil. It also checks the escape of water vapour by physical obstruction. It exerts a decisive effect on earliness, yield and quality of the crop. Reducing loss of water through transpiration appears to be a promising approach for efficient water utilization in summer season. Transpiration could be effectively reduced without materially affecting the photosynthesis through judicious use of energy reflecting material like antitranspirants. Timely sowing of pearl millet by drilling method yields maximum and decreases subsequently with delay in sowing. Summer pearl millet is generally grown after vegetable crops like chilli, brinjal, cauliflower, cabbage, potato as well as tobacco and early sown wheat which many times do not permit timely sowing of pearl millet crop resulting in poor yield under middle Gujarat conditions. In this situation, raising seedling in the nursery and timely

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