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Yield and water use of summer transplanted pearlmillet (*Pennisetum glaucum* L.) as influenced by IW : CPE ratios, mulches and antitranspirant

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ABSTRACT

A field experiment was conducted at College Agronomy Farm, B.A. College of Agriculture, Anand, Gujarat on loamy sand soil during summer season of the year 2006 and 2007 to elucidate the effect of irrigation, mulches and antitranspirant on yield and water use efficiency of summer transplanted Pearlmillet (*Pennisetum glaucum* L.). The results revealed that significantly higher pearlmillet grain and dry fodder yields were obtained under 1.1 IW : CPE ratio, though it was at par with 0.9 IW : CPE ratio. Among the mulches white plastic sheet mulch was found significantly superior and which was at par with an application of pearlmillet Bhusa. Which increased the consumptive use of water and water use efficiency over control. Also antitranspirant 6 % kaolin spray recorded significantly higher grain and fodder yields of pearlmillet.

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Key words : Pearlmillet, IW : CPE ratio, Mulch, Kaolin and Yield

INTRODUCTION

In summer season, water is the limiting factor and costly input for crop production for semi arid and arid tropics. Water is a key factor to enhance the crop productivity and is also prerequisite for an efficient utilization of all the farming inputs. Summer cultivation of transplanted Pearlmillet (*Pennisetum glaucum* L.) particularly in irrigated areas of the Gujarat has got importance, because of the assurance of targeted crop yield. Irrigation in summer pearlmillet is one of the major input of crop production. Supply of timely and adequate irrigation is a key factor for high and economic yield. Parihar *et al.* (1974) advocated more practicable approaches of the use of IW : CPE ratio for different crops. Mulches maintains the soil water status through reducing evaporation, runoff and weeds. 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 produces. Judicious application of reflective pigments to increase the albedo and thus, decrease the net radiation load on the canopy and material. It should be possible to reduce transpiration by use of antitranspirant kaolin without affecting the photosynthesis and thus increase water use efficiency. Reducing loss of water through transpiration appears to be a promising approach for the efficient water utilization in summer season. Accorrdingly, an experiment was planned to evaluate the effect of irrigation, mulches and antitranspirant on yield and water use efficiency of summer transplanted Pearlmillet under middle Gujarat conditions.

MATERIALS AND METHODS

A field experiment was conducted at the College Agronomy Farm, Department of Agronomy, B. A. College of Agriculture, Anand Agricultural University, Anand during the years 2006 and 2007 during summer season on loamy sand soil. The soils of the experimental site was free from any kind of salinity or sodicity hazards, low in organic carbon and nitrogen, medium available phosphorus and high in potassium. There were 18 treatment combinations, comprising of three levels, each of irrigation schedules (0.7, 0.9 and 1.1 IW : CPE ratios) and mulches (Control, Pearlmillet Bhusa @ 5 t ha^{-1} and White plastic sheet, 200 gauge) and two levels of antitranspirant (Control *i.e.* water spray and 6 % kaolin spray at 20 and 50 DATP) embedded in a split-split plot design with four replications. A recommended fertilizer dose of chemical fertilizer 120-60-0 kg NPK per hectare was applied uniformly. Full dose of phosphorus (60 kg P_2O_5 ha^{-1}) through diammonium phosphate and 50 per cent nitrogen (60 kg N ha^{-1}) from diammonium phosphate as well as ammonium sulphate were applied in opened furrows

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