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RESEARCH ARTICLE :

Summer sorghum (*Sorghum bicolor* (L.) Moench) production influenced by irrigation scheduling : A climatological approach

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SUMMARY : A field experiment was conducted during summer of 2010 and 2011 at AICRP on Water Management, Marathwada Krishi Vidyapeeth, Parbhani (M.S.) to study the effect of different irrigation schedules on the productivity of summer sorghum grown on Vertisols. The soil of the experimental site was low in organic carbon and nitrogen, medium in available phosphorus and fairly rich in potassium and slightly alkaline in reaction. The experiment was laid out in randomized block design with four replications. The net plot size was 5.4 m x 3.6 m. The treatments comprising of four irrigation schedules *viz.*, I_1-0.6 IW:CPE, I_2-0.8 IW:CPE, I_3-1.0 IW:CPE and I_4-As per the canal rotation interval. During both years, seeds of summer sorghum Var.SPV-655 were dibbled with spacing of 45 cm x 15 cm on 30th January in flat beds. Scheduling of irrigation was done on the basis of climatological approach (IW:CPE). Depth of irrigation was maintained 60 mm per irrigation in each treatment. The pooled results revealed that summer sorghum performed better throughout the growth stages and significantly higher grain, fodder, *bhoosa*, biological yields and bio-energy values were recorded under irrigation scheduled at 1.0 IW:CPE (15 irrigations) which being on par with 0.8 IW:CPE (12 irrigations), as compared to 0.6 IW:CPE (10 irrigations) and canal rotation interval (10 irrigations) treatment. Whereas, significantly lowest values of economic yields were recorded by canal rotation interval treatment than others. During both the years of study, highest mean daily and total consumptive use of water was recorded with 1.0 IW:CPE, ratio while the lowest values were recorded with 0.6 IW:CPE, ratio however, WUE was decreased with increase in the frequency of irrigation schedules. In addition, summer sorghum plants extracted most of their moisture needs from the uppermost soil layers (0-15 cm and 16-30 cm soil depths) than the lower successive soil layers. The economic yield-irrigation water relations showed that during first and second year; these relationships were quadratic and exponential, respectively, however, on pooling; the results showed linear response. Thus, it is concluded that scheduling of irrigation with 0.8 IW:CPE ratio (12 irrigations) found optimum for cultivation of summer sorghum on Vertisols under assured irrigated conditions of Parbhani (M.S.).

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