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RESEARCH PAPER

Soil temperature, PAR interception and crop phenology of maize (*Zea mays* L.) as influenced by straw mulching and herbicides

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Abstract : A multi location experiment was conducted at Punjab Agricultural University, Ludhiana and Regional Research Station Gurdaspur (PAU) during *Kharif* 2017 to evaluate the effect of straw mulching and herbicides on soil temperature, PAR interception and crop phenology of maize. Application of mulch at 9.0 t ha^{-1} helped to reduce the soil temperature at 5 cm soil depth by 3.8 to 4.6^{0}C at 20 DAS, 1.0 to 1.4^{0}C at 40 DAS, 1.0 to 1.3^{0}C at 60 DAS and 0.7 to 1.2^{0}C at harvest as compared to no mulch treatment, but at 10 cm soil depth the temperature was reduced by 2.2 to 3.7^{0}C at 20 DAS, 1.3^{0}C at 40 DAS, 0.5^{0}C at 60 DAS and 0.4^{0}C at harvest at both the locations. High values of PAR interception and less number of days taken to tasselling, silking and physiological maturity were recorded with application of PSM 9.0 t ha^{-1} as compared to PSM 6.25 t ha^{-1} and no mulching treatments. Mulch application at 6.25 t ha^{-1} also significantly lowered the soil temperature and resulted in significantly higher PAR interception and less number of days to tasselling, silking and physiological maturity as compared to no mulch treatment. Different weed control treatments did not significantly influence the emergence of maize and soil temperature at 5 cm and 10 cm depth at both the locations. Application of tembotrione at 0.088 kg ha^{-1}, tembotrione at 0.110 kg ha^{-1} and weed free treatments recorded statistically similar but significantly higher values of PAR interception and less number of days for tasselling, silking and physiological maturity as compared to atrazine at 0.8 and 1.0 kg ha^{-1} and unweeded check.

Key Words : Atrazine, Crop phenology, Maize, PAR interception, Soil temperature, Straw mulching, Tembotrione

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