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EVALUATION OF MULCHING SYSTEMS FOR MITIGATION OF LOW TEMPERATURE STRESS OF *HEVEA BRASILIENSIS* SEEDLINGS GROWN IN NORTH EAST INDIA

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Different mulching systems using paddy straw, polythene, Farm Yard Manure (FYM), paddy straw along with FYM, polythene overhead cover and FYM plus paddy straw along with polythene overhead cover were evaluated in a polyclonal seedling nursery of *Hevea brasiliensis*. During low temperature stress, the soil temperatures in the morning were 1.74 and 1.92°C higher under the treatments FYM + paddy straw mulching and polythene overhead cover respectively when compared to control. The combination of these two mulching systems increased the soil temperature by 1.94°C over control. Plants under polythene overhead cover showed better photosynthesis and growth. However, with removal of polythene cover and with increase in air temperature during the month of March – May, six month old seedling under both FYM + paddy straw mulching and polythene overhead cover with FYM – straw mulching attained comparable stem diameter. While 46.5 per cent seedlings attained the required stem diameter for budding under FYM + paddy straw mulching and 44 per cent under polythene overhead cover with FYM - paddy straw mulching, only 22.5 per cent seedlings attained similar diameter in control.

Key words: *Hevea brasiliensis*, Low temperature, Mulching, Seedling growth.

INTRODUCTION

Natural rubber (*Hevea brasiliensis*) seedlings experience a low temperature stress during their early growth stage particularly in the north eastern regions. Nursery practice of India that can minimize the adverse effects of low temperature can improve the growth of the seedlings. In peak winter season, the minimum ambient temperature varies from 7.8°C to 12.9°C during early morning followed by high irradiance (Ray *et al.*, 2003). This atmospheric condition in particular is highly detrimental to the young plants. Mulching is reported to be an effective cultural practice to overcome the delererious effects of low temperature in many crops (Liakatas *et al.*, 1986; El-hassan, 1986; Kim *et al.*, 1988; Chamabasavanna and Setty, 1991). It also conserves soil moisture and improves the soil temperature during winter season (Dey and Hundal, 2003). Soil temperature may be a growth limiting factor for tree seedlings when the mean root zone soil temperature during the growing season is 10 to 18°C with the

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