



Research Paper

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Economics and effect of various herbicidal treatments on fruit quality and yield of plum cv. SATLUJ PURPLE

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ABSTRACT : Efficient weed control is a challenging undertaking in most orchards as it affects the growth, yield and successful orcharding. The investigation on weed management and economics of various herbicidal treatments in plum was conducted at Punjab Agricultural University, Ludhiana during the cropping season. The experiment was carried out with ten (10) weed management treatments *viz.*, T₁= Diuron @ 1.2 kg/ha; T₂= Diuron @ 1.6 kg/ha; T₃= Diuron @ 2.4 kg/ha; T₄= Mulching with black polythene (400 gauge); T₅= Glyphosate @ 0.8 l/ha; T₆= Glyphosate @ 1.2 l/ha; T₇= Glyphosate @ 1.6 l/ha; T₈= Sod culture; T₉= Weed free check; T₁₀= Unweeded check. Pre-emergence herbicide (Diuron) and black polythene mulch were applied during the first fortnight of March and the Post-emergence herbicide (Glyphosate) on second fortnight of March. The results indicated that the different weed management treatments significantly improved the fruit weight, pulp weight and fruit yield. However, maximum fruit weight, pulp weight and fruit yield was obtained under followed by glyphosate @ 1.6lha⁻¹ (T₇) as post-emergence and diuron @ 2.4 kgha⁻¹ (T₃) as pre-emergence application. Based on the weed control efficiency, weed index values, black polythene mulch (T₄) proved to be most effective. Considering net benefit from economic analysis, it appeared that the herbicide glyphosate @ 1.6 l/ha (T₇) is the best possible option for effective and economic weed control in high density planted plum. Black polythene mulch (T₄) is not at all cost-effective.

KEY WORDS : Plum, *Prunus salicina*, Weed management, Glyphosate, Diuron, Mulch, Sod culture, Economics

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Plum orchards face a number of production retarding situations which increase their cost of production on per unit area basis. Competition offered by weed plants is one of them. The weeds cause heavy losses by competing with the main crop for water and nutrients and also provide potential breeding niche for various insects/pests and diseases. In addition to harbouring of insect-pests and microorganisms weed roots produce allelopathic effect which interfere with growth and bearing of main crop (Chatha and Chanana, 2007). Weed control is considered to be one of the most important and expensive cultural practice in the orchard. Mostly the weeds are controlled by hand hoeing or by growing of cover crops or intercrops. However, the method of hand hoeing is very laborious and inefficient. Mulching is another effective measure to control annual weeds. Mulches promote crop development and early harvest, and increase yields. Very

little weed growth occurs under the mulch as the mulches prevent penetration of light or exclude certain wavelengths of light that are needed for the weed seedlings to grow (Ossom *et al.*, 2001). Mulches greatly retard the loss of moisture from the soil. As a result, higher and uniform soil moisture regime is maintained reducing the irrigation frequency. The cumulative cost of equipment, labour and energy used in the control of weeds by physical means is quite high. Hence, the chemical weed control and mulching is gaining momentum during the last decade. Now a day application of black plastic mulch film is becoming popular and very good results have been achieved (Kumar and Bhardwaj, 2012). The beneficial effects of organic and synthetic mulches for crop production have been widely discussed by Ravi and Lourduraj (1996). However, no such studies on the effect of various herbicides on fruit yield and quality and their economics have been conducted in subtropical