



Research Article

Crop yield, efficiency and economics of autumn and spring sown single bud sugarcane intercropped with pulse crops

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ABSTRACT : The low plant population albeit of high seed rate in sugarcane (*Saccharum officinarum*) coupled with shrinking net cultivable land in Punjab, necessitates the generation of an innovative technique that aims at enhancing plant population and maximization of land-use. In this context, a single-bud sowing technique in sugarcane might be a convincing option for reducing seed rate and furthermore, being long duration and widely spaced crop it offers considerable scope for intercropping for maximization of land-use. The present investigation was, therefore conducted during 2009-10 to assess the potential of single-bud planted autumn (*var.* CoJ-64) and spring sugarcane (*var.* CoH-119) intercropped with pulses (gram/lentil/summer moong/summer mash) at farmers' field in sub-tropics of Roop-nagar (Punjab). During the study period, 94-97 per cent bud germination was observed in single-bud planted cane plots as opposed to 76-84 per cent in three-bud planted plots. The intercropping of spring and autumn planted sugarcane with pulses exerted a synergistic effect on sugarcane in terms of enhanced yield and improved production and economic efficiency. The autumn cane yield increased by 3.97 and 2.48 per cent, respectively with intercropping of gram and lentil over sole cane. The highest cane yield (125.6 t ha⁻¹) was obtained when sugarcane was intercropped with gram followed by intercropping with lentil (123.8 t ha⁻¹) and sole cane (120.8 t ha⁻¹). The economic analysis demarcates autumn sugarcane + gram as most profitable intercropping system that gave the highest net returns (Rs. 178042.5 ha⁻¹) and the highest B-C ratio (1.84) as compared to autumn sugarcane + lentil and sole cane. Maximum production efficiency (356.9 kg ha⁻¹ day⁻¹) and economic efficiency (Rs. 462.4 ha⁻¹ day⁻¹) values in sugarcane + gram intercropping system also reflected the same. Likewise, the cane yield increased by 3.2 and 2.2 per cent, respectively with intercropping of summer moong and summer mash over sole spring cane. However, highest cane yield (121.6 t ha⁻¹) was obtained with intercropping of sugarcane with summer moong followed by intercropping with summer mash (120.4 t ha⁻¹) and sole cane (117.8 t ha⁻¹). Economically, sugarcane + summer moong intercropping system gave highest net returns (Rs. 177607.9 ha⁻¹), production efficiency (404.2 kg ha⁻¹ day⁻¹) and economic efficiency (Rs. 530.2 ha⁻¹ day⁻¹) than sugarcane + summer mash and sole cane. Thus, it can be concluded that single-bud technique in spring and autumn sugarcane intercropped with pulses, has immense scope in subtropical areas.

KEY WORDS : Single-bud technique, Production efficiency, Economic efficiency, Intercropping

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INTRODUCTION

Sugarcane (*Saccharum officinarum*) is an important and

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assured crop in tropical and subtropical India. Sugarcane production in India during the last decade has been reported to fluctuate between 233 and 355 Mt, in contrast to its productivity at the farm level which is as low as 40 t ha⁻¹ (Gujja *et al.*, 2009). However, the low plant population owing to the low germination rate (35-40%) albeit of high seed rate (6.0 t ha⁻¹) in sugarcane (*Saccharum officinarum*) (Singh *et al.*, 2011) has been recognized as major culprit for lower cane production. Owing to the high seed rate of sugarcane, the profit margins of farmers are dwindling since the planting material costs 22 to 25 per cent of the total production cost (Srivastava *et al.*, 1981).