

## Effect of pearl millet (*Pennisetum glaucum*) based intercropping system on yield and economics of pearl millet on shallow soils under rainfed conditions

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### ABSTRACT

A field experiment was undertaken to study the intercropping of important legumes in pearl millet (*Pennisetum glaucum* (L.)R.Br.) under rainfed conditions during the *kharif* season of 2003 and 2004 at College of Agriculture, Dhule, Maharashtra. An intercropping of pearl millet + moth bean planted at 2:1 row ratio produced significantly higher pearl millet grain equivalent yield (36.62 q ha<sup>-1</sup>) than all other intercropping systems and sole cropping, however, it was at par with pearl millet + cowpea (33.56 q ha<sup>-1</sup>). Similarly the highest net monetary returns (Rs.14617 ha<sup>-1</sup>) as well as benefit-cost ratio (2.98) and the LER (1.47) were recorded in pearl millet + moth bean intercropping system. On the basis of pearl millet equivalent yield, net monetary returns and LER showed that pearl millet + moth bean (2:1) or pearl millet + cowpea (2:1) appears the most productive, efficient and profitable for rainfed conditions of scarcity zone of north Maharashtra.

**Key words :** Intercropping system, Pearl millet equivalent yield, LER., Rainfed conditions.

### INTRODUCTION

Pearl millet (*Pennisetum glaucum*) is mostly spread in Rajasthan, Gujarat, Maharashtra, Uttar Pradesh, Haryana and Karnataka. As its cultivation is mostly confined to rainfed lands poor and impoverished soils, growing of pearl millet as a sole crop under this situation is rather risky and uneconomical. Intercropping can increase the production and productivity by better utilization of available resources and thereby helps to minimize the risks and brings stability under rainfed conditions. Intercropping provides stability and ensures adequate yields of one of the component crops (Rao and Willey, 1983; Subba Reddy and Havangi, 1986) under aberrant weather situations. Its intercropping with grain legumes such as cowpea, moth bean, horse gram is a common recommended practice. Plant population and spatial arrangement in intercropping have important effects on the balance of competition between component crop and on their productivity. To study the performance of suitable pearl millet based intercropping system, the present experiment was planned and conducted under rainfed condition.

### MATERIALS AND METHODS

A field experiment was conducted during the *kharif* season of 2003 and 2004 at Bajra Research Scheme, College of Agriculture, Dhule, in randomized block design with eight treatments replicated three times. The soil of experimental site was shallow having pH 8.0, low in organic

carbon (0.44 %), low in nitrogen (276 kg ha<sup>-1</sup>), medium in phosphorus (18 kg ha<sup>-1</sup>) and rich in potassium (462 kg ha<sup>-1</sup>). The recommended fertilizer schedule 40 kg N + 20 kg P<sub>2</sub>O<sub>5</sub> per hectare was applied for both sole pearl millet and intercropping systems whereas, for sole moth bean, horse gram and cowpea 20 kg N + 40 kg P<sub>2</sub>O<sub>5</sub> per hectare was given. The recommended cultivars like Shradha of pearl millet, MBS-27 of moth bean, Sina of horse gram and local of cowpea were used in the experiment. The sole pearl millet was sown at the spacing of 45 cm x 15 cm while for sole moth bean, horse gram and cowpea the recommended plant spacing i.e. 30 cm x 10 cm was adopted and in intercropping systems plant spacing 30 cm x 15 cm were followed. The crops were sown in first week of July in both seasons of experimentation. The total rainfall received during crop growth period in 2003 and 2004 was 854 mm, and 778.8 mm, respectively. Both the crop seasons were normal for crop growth.

Pearl millet grain equivalent yield was calculated by converting seed yield of intercrop into pearl millet on the basis of prevailing market rates of the crop produce. Net monetary returns and benefit-cost ratio were computed by using the prevailing rates of inputs and produce.

### RESULTS AND DISCUSSION

#### *Pearl millet grain equivalent yield :*

The pearl millet grain equivalent yield (Table 1) was found to be influenced by different intercropping systems. The pooled mean data showed that intercropping of pearl

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