

Effect of organic manures on productivity of finger millet and redgram inter cropping system under protective irrigation

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ABSTRACT

A Field experiment was conducted at University of Agricultural Sciences, Bangalore, Karnataka, India during *Kharif* seasons of 2006 and 2007. The soil of experimental site was red sandy loam and clay loam in texture with slightly acidic in nature. The experiment was laid out in Randomized Block Design with four replications and seven treatments comprised of different organic sources such as FYM, sewage sludge, poultry manure compost, urban garbage compost, vermicompost and enriched urban garbage compost and they were applied at the rate equivalent to recommended nitrogen and were compared with recommended inorganic fertilizers to study the response of Ragi + Redgram intercropping system under protective irrigation. Application of either sewage sludge or poultry manure compost produced significantly higher grain yield (2498 and 2475 kg ha⁻¹, respectively) and straw yield of finger millet (4065 and 4009 kg ha⁻¹, respectively) and redgram grain and stalk yield (370 and 355 kg ha⁻¹, respectively). The study clearly revealed that sewage sludge and poultry manure compost application at equivalent recommended nitrogen dose could be successfully used for finger millet and redgram intercropping system to substitute the chemical fertilizers and found to be sustainable.

Key words : Finger millet, Redgram, Organic manures, Protective irrigation and yield, Intercropping

INTRODUCTION

In recent energy crisis, hike in the prices of the inorganic fertilizers and declining soil health and productivity necessitate the use of organic manures compulsorily in agricultural crop production. The continuous use of inorganic fertilizers under intensive cropping system has caused widespread deficiency of secondary and micronutrients in soil (Anonymous, 2005). Ragi + redgram intercropping system (8 :2) under rainfed condition is a common practices in southern Karnataka. It can be evaluated as an additive intercrop redgram would increase the productivity of soil and cropping system besides helps to supply protein to the farmers. The research evidences conspicuously indicated that the yield advantages are possible through protective irrigation in inter cropping over sole cropping. It is necessary to manage the soil moisture through protective irrigation. Although the millet crops are reported to be most tolerant to moisture stress but even for short period of moisture stress during critical stages of growth, markedly reduces the yield (Udayakumar *et al.*, 1986). The information on sustainable productivity of finger millet and redgram with use of organic manures in finger millet based intercropping system is essential.

season of 2006 and 2007 at Gandhi Krishi Vignana Kendra, University of Agricultural Sciences, Bangalore. The soil of the experimental site was red sandy loam in texture classified under the order *Alfisols*, Vijaipura series, isohyperthermic family of *oxihaplustaf*. pH was slightly acidic (6.44) having low cation exchange capacity (7.50 C mol kg⁻¹) with an electrical conductivity of 0.23 dSm⁻¹. The organic carbon content was low with 0.47 per cent. The soil was low in available nitrogen (202.8 kg ha⁻¹), high in available phosphorus (26.2 kg ha⁻¹) and medium in available potassium (217.10 kg ha⁻¹). The experiment was conducted in Randomized Complete Block Design with four replications to study the response of finger millet + redgram intercropping system under protective irrigation condition as influenced by different organic sources. Seven treatments comprised of different organic sources such as FYM, sewage sludge, poultry manure compost, urban garbage compost, vermicompost and enriched urban garbage compost were applied at the rate equivalent to recommended nitrogen basis and then compared with the recommended inorganic fertilizers. Yield and yield attributes were recorded at harvest in both the crops. Protective irrigation was given thrice to the crop based on the availability and economics of intercropping systems were worked out based on prevailing market price of product.

MATERIALS AND METHODS

Field experiment was conducted during the *Kharif*

RESULTS AND DISCUSSION

The results obtained from the present investigation

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