

Effect of chemical weed control on nutrient uptake and economics of direct seeded puddled rice (*Oryza sativa* L.)

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ABSTRACT

Field experiment was carried out on effect of chemical weed control nutrient uptake and economics of direct seeded puddled rice at Zonal Agricultural Research Station, V.C. Farm, Mandya, Karnataka. Results revealed that pre-emergent application of Butachlor @ 1.0 kg ai ha⁻¹ + Safener recorded maximum net returns (Rs. 13,962 ha⁻¹) and B:C ratio (2.15) closely followed by Pretilachlor @ 0.4 kg ai ha⁻¹ + Safener (Rs.13,768 ha⁻¹) and B:C ratio (2.04). However, hand weeding twice at 20 + 40 DAS has registered highest net returns (Rs. 14,770 ha⁻¹). Higher uptake of nitrogen was noticed with Butachlor @ 1.0 kg ai ha⁻¹ + Safener (196.3 kg ha⁻¹) followed by Pretilachlor @ 0.4 kg ai ha⁻¹ + Safener (183.1 kg ha⁻¹) compared to other treatments.

Key words : Rice, Nitrogen, Uptake, Economics, Net returns, Herbicides, Anilphos, Pendimethalin, Butachlor, Pretilachlor

INTRODUCTION

Rice is an important staple food crop of the world and India. It is grown under different ecosystems viz., irrigated, rainfed lowland, rainfed upland and flooded conditions by small and poor farmers with labour intensive methods of production. In most of the Asian countries rice is established through transplantation, which is time consuming, laborious and costly. Whereas, the direct seeding methods are easy, time and labour saving and low cost methods with grain yield equivalent or even higher than transplantation method (IRRI, 1969 and De Datta, 1988). Broadcasting of pre-germinated seeds on the puddled soil is one of the methods of direct seeding. In direct seeded rice weed infestation and competition is very severe, because the crop and the weed seeds germinate simultaneously and compete for same pool of resources. In recent years several herbicides have been made available to manage the weeds in varied situations. Therefore, the present study was conducted to know the effect of chemical weed control on nutrient uptake and economics of direct seeded puddled rice.

MATERIALS AND METHODS

Field experiment was conducted during *Kharif* 2005 at Zonal Agricultural Research Station, V.C. Farm, Mandya (Karnataka) to study the bio-efficacy of pre-emergent herbicides to control weeds and their effect on growth and yield of rice. The soil of the experimental site was sandy loam in texture, neutral in reaction and medium in soil fertility. The experiment consisted of 14 treatments, which include herbicides like Anilphos 30 EC,

Pendimethalin 30 EC, Butachlor 50 EC and Pretilachlor 50 EC. All tried alone at different concentrations and in combination with 2,4-D 36 EC. The experiment was replicated thrice and laid out in RCBD. The pre-germinated seeds of Rasi (IET-1444) were broadcasted uniformly on the puddle soil. The herbicides were applied uniformly as per the treatments at 4 days after sowing. The spray solution was used at the rate of 700 litres per hectare. The experimental data were analyzed statistically at 5 per cent level of probability. The weed count and the weed dry weight data were subjected to square root transformation and analyzed statistically (Sundar *et al.*, 1972). Available nitrogen was estimated by using standard procedure of Walkely and Blacks wet oxidation method (Piper, 1996).

RESULTS AND DISCUSSION

The results obtained from the present study as well as relevant discussion have been presented under following heads:

Effect on nitrogen uptake:

The maximum uptake of nitrogen by crop varied significantly due to weed control methods (Table 1). Higher amount of nitrogen uptake among herbicidal treatments was noticed with Butachlor + Safener @ 1.0 kg ai ha⁻¹ (196.3 kg ha⁻¹) followed by Pretilachlor + Safener @ 0.4 kg ai ha⁻¹ (183.1 kg ha⁻¹). Higher yield (Grain and straw) as a result of better plant stand and weed control resulted in increased absorption and transport of higher amount of nutrients. The difference in uptake of nutrients

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