

Effect of chemical weed control on growth and yield of direct seeded puddled rice (*Oryza sativa* L.)

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ABSTRACT

Field experiment was carried out on effect of chemical weed control on growth and yield of direct seeded puddle rice Zonal Agricultural Research Station, Mandya. Results revealed that better weed control and higher grain yield of rice was achieved with pre-emergent application of Butachlor @ 1.0 kg ai ha⁻¹ + Safener (5334 kg ha⁻¹) followed by Pretilachlor @ 0.4 kg ai ha⁻¹ + Safener (5100 kg ha⁻¹). However, the minimum yield (5562 kg ha⁻¹) was recorded with hand weeding twice at 20+40 DAS. The toxicity of the herbicides on rice plant was very low and plant stand was better compared to other treatments. They also recorded higher plant height and low grain sterility.

Key words : Toxicity, Weed population, Plant density, Weedy check

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 bio-efficacy of the pre-emergent herbicides to control the weeds and their effect on growth and yield of 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 Anilophos 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 DAS. The spray solution was used at the rate of 700 litres per hectare. The experimental data was analyzed statistically at 5 per cent level of probability. The weed count and the weed dry weight data was subjected to square root transformation and analyzed statistically (Sundar Raj *et al.*, 1972)

RESULTS AND DISCUSSION

The results obtained from the present investigation are summarized below :

Effect on weeds:

The predominant weed flora noticed in the experimental plots were *Echinochloa crusgalli*, *Leptochloa chinensis* and *Panicum repens* among the grasses and *Cyperus iria*, *Cyperus difformis* and *Fimbristyllis miliace* among the sedges and *Eclipta alba*, *Marsilia quadrifolia*, *Centella asiatica* and *Monochoria vaginalis* among the dicot weeds.

The visual observations on toxicity of herbicides revealed that all the herbicidal treatments caused phytotoxic effect on rice crop except Butachlor @ 1.0 kg ai ha⁻¹ + Safener and Pretilachlor @ 0.4 kg ai ha⁻¹ + Safener. Very low or no toxic effects were observed with these herbicidal treatments could be attributed to the

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