WEED MANAGEMENT IN RICE AND ITS CARRY
OVER EFFECT ON SUCCEEDING BLACK GRAM

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ABSTRACT

Field experiments were conducted on weed control in rice-blackgram at Annamalai University Farm, Annamalainagar, India during 1999-2000. Among the rice weed control measures, hand weeding twice recorded the least weed counts (19.0 m⁻²) and weed dry matter production (300.2 kg ha⁻¹) with maximum rice grain yield (5.91 t ha⁻¹), which was at par to incorporation of 10 t pressmud ha⁻¹ + 1 t Azolla ha⁻¹ (5.72 t ha⁻¹). The later had positive carry over effect on weed control in succeeding black gram also.

Rice cultivation either as a single crop or double crop during monsoon season and black gram or green gram either as relay crop (sown on standing rice a week prior to harvest) or immediately after the harvest of rice during the summer, has been the traditional cropping pattern in the Cauvery delta region, popularly known as rice granary of Tamilnadu State in India. Black gram suits the fallows better, by virtue of its ability to grow with residual soil moisture and to restore the soil fertility through symbiotic nitrogen fixation. Annually, 15 million tonnes of rice is reported to be lost due to weeds in India (Chatterjee and Maiti, 1981) and black gram, since raised under marginal conditions with meagre inputs also suffer equally due to weed competition. Hence, the study was taken up to evolve an efficient and economic weed management for the rice-blackgram cropping system and to trace carry-over effect of rice weed control on black gram also.

Experiments were conducted Annamalai University Experimental Farm, Annamalainagar (Tamil Nadu) during 1999-2000. The soil of the experimental field was clayey loam with a pH of 7.3 and organic matter content of 0.78 per cent. The soil was low in available N (239 kg ha⁻¹), medium in available P₂O₅ (20.3 kg ha⁻¹) and high in available K₂O (312 kg ha⁻¹). The experiment was laid out in randomized block design with four replications. The treatments are given in the Table 1.

Seedlings of rice cv. CO 43 were transplanted at a spacing of 20 cm x 10 cm. The recommended fertilizer dose of 150 kg N, 50 kg P₂O₅ and 50 kg K₂O ha⁻¹ was applied uniformly to all the treatments. Pressmud, a bio-product from sugar factory, was incorporated 10 days before transplanting. Azolla was inoculated seven days after transplanting. Butachlor was applied 3 days after transplanting (DAT). All the intercultural practices were taken as need based. Immediately after harvest of rice, seeds of black gram cv. ADT 3 were dibbled, when the soil was in soft waxy state (without any field preparation) in order to study the carry-over effect of rice treatments on black gram. For both the crops, weed counts and weed dry matter production (DMP) were recorded.

Effect on rice weeds: Among the weed control measures in rice, untreated control recorded the highest weed counts (82.1 m⁻²) and weed DMP (947.1 kg ha⁻¹). Hand weeding recorded the least weed counts (19.0 m⁻²) and weed dry matter production (300.2 kg ha⁻¹) due to manual removal of existing weeds (Navarez and Moody, 1989). It was at par with the application of 10 t pressmud ha⁻¹ + 1 t Azolla ha⁻¹. Pressmud incorporation destroyed the weed seeds and seedlings due
### Table 1. Effect of weed control measures in rice and its carry over effect on succeeding black gram

<table>
<thead>
<tr>
<th>Treatments</th>
<th>Weed count on 60 DAT (No. m⁻²)</th>
<th>Weed DMP on 60 DAT (kg ha⁻¹)</th>
<th>Grain yield (t ha⁻¹)</th>
<th>Weed count on 45 DAT (No. m⁻²)</th>
<th>Weed DMP on 45 DAT (kg ha⁻¹)</th>
<th>Seed yield (t ha⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>82.1</td>
<td>947.1</td>
<td>3.75</td>
<td>76.4</td>
<td>592.0</td>
<td>0.67</td>
</tr>
<tr>
<td>Hand weedings twice</td>
<td>19.0</td>
<td>300.2</td>
<td>5.91</td>
<td>72.3</td>
<td>526.0</td>
<td>0.76</td>
</tr>
<tr>
<td>10 t Pressmud ha⁻¹</td>
<td>65.3</td>
<td>784.2</td>
<td>4.35</td>
<td>73.5</td>
<td>560.0</td>
<td>0.88</td>
</tr>
<tr>
<td>1 t Azolla ha⁻¹</td>
<td>37.3</td>
<td>507.4</td>
<td>5.10</td>
<td>73.0</td>
<td>534.0</td>
<td>0.81</td>
</tr>
<tr>
<td>10 t Pressmud ha⁻¹ + 1 t Azolla ha⁻¹</td>
<td>24.7</td>
<td>315.7</td>
<td>5.72</td>
<td>70.4</td>
<td>510.0</td>
<td>0.93</td>
</tr>
<tr>
<td>1.25 kg Butachlor ha⁻¹</td>
<td>42.6</td>
<td>540.5</td>
<td>5.06</td>
<td>73.3</td>
<td>548.0</td>
<td>0.73</td>
</tr>
<tr>
<td>CD (P=0.05)</td>
<td>6.1</td>
<td>139.2</td>
<td>0.45</td>
<td>NS</td>
<td>NS</td>
<td>0.04</td>
</tr>
</tbody>
</table>

NS - Non significant.

...to reduced soil pH and allelochemicals produced from the native microbes of pressmud (Shanmugavadivu and Kathiresan, 1997). Azolla inoculation also complemented the weed suppression as the thallus growth formed a thick mat on the surface of water, curtailing the interception of light by weed seeds and seedlings as reported by Kannaiyan et al. (1983). Integrated use of azolla inoculation and pressmud incorporation was appreciable and comparable to hand weeding with regard to weed suppression. These results are close conformity with the result of Kathiresan and Vijayabaskaran (1993).

#### Effect on rice yield:
Hand weeding twice recorded the highest grain yield (5.91 t ha⁻¹) of rice which was on par with the application of 10 t Pressmud ha⁻¹ + 1 t Azolla ha⁻¹ mainly due to better weed control and weed free environment. Similar results were reported by Navarez and Moody (1989) and Kathiresan and Vijayabaskaran (1993) also.

#### Effect on succeeding black gram:
Among the treatments given to the rice crop, incorporation of 10 t Pressmud ha⁻¹ + 1 t Azolla ha⁻¹ reduced the weed count (70.4 m⁻²) and weed DMP (510.0 kg ha⁻¹) with the maximum grain yield (0.93 t ha⁻¹) of succeeding black gram. This might be due to better weed control in rice crop and favourable residual on physico-chemical and biological properties on the soil (Marcus Franda, 1981).

### REFERENCES


