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# STUDIES ON THE COMPARATIVE PERFORMANCE OF GRANULAR WEEDICIDES ON RICE

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Weeding is one of the items of rice culture that consumes a major share of cost of cultivation. Attempts to substitute the conventional mode of hand weeding with chemical weed control proved in many an occassion sucessfull (Soundrapandian *et al.*, 1972 and Sahu and Das, 1969) but not always practically feasible. Difficulty in spraying these chemicals at the right time in the proper way had been one of the factors that precluded the widespread preferential acceptance of chemical weed control. Granular phytoehemicals with toxicity to a wider spectrum of weed species of rice and convenience in their application might be expected to counteract the practical difficulties to an extent. The experiment under report was designed and laid out to study the comparative performance of three granular weedicides recently introduced into the market on the growth and yield of rice and control of associated weeds.

## Materials and Methods

An experiment was conducted at the farm attached to the Agricultural College, Vellayani, for two consecutive seasons (*mundakan* and *punja*) from July 1972. It was laid out in randomized block design and was replicated thrice. Three commercial preperations of granular weedicides were used, viz (i) Machete (2-chloro-2' 6' diethyl n (butorymethyl) acetanylide), (ii) Tok Granular (2, 4-dichlorophenyl p-nitrophenyl ether) and (iii) Weedone (2, 4 - dichlorophenoxy acetic acid). The treatments were (1) Control (no weeding) (2) Hand weeding twice at monthly intervals (3) Weed-free environment (4) Upper recommended level of Machete (44 kg/ha) (5) 3/4 recommended leva! of Machete (33 kg/ha) 6) Upper recommended level of Tok Granular (40 kg/ha) (7 3/4 recommended level of Tok Granular (30kg/ha) (8) Upper recommended level of Weedone (30 kg/ha) and (9) 3/4 recommended level of Weedone (22kg/ha).

Weedicides were applied as per treatments one week after transplanting. Standing water was maintained in all plots till two weeks prior to harvest. For recording weed count quadrats of 0.5m were marked at random in each plot. In the case of the two weeds, viz: *Brachyra* sp., which was of a spreading type and *Salvinia auriculata* an aquatic weed, percentage spread in the quadrat of observation was taken.

Table 1

**Effect of weedicides and intensity of hand weeding on yield and yield contributing characters of rice. Season 1 *(Mundakan)***

| Treatment | Grain yield (kg/ha) | | No. of panicles/m² | | No. of spikelets/panicle | | Percentage of fertile grains | | 1000 grain weight (g) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | A | B | A | B | A | B | A | B |
| 1. Control (no weeding) | 3826 | 1619 | 350 | 592 | 85 | 93 | 93 | 83 | 23.0 | 23.0 |
| 2. Handweeding twice | 4303 | 1821 | 400 | 658 | 92 | 82 | 93 | 75 | 23.2 | 22.9 |
| 3. Weed free | 4143 | 1790 | 434 | 633 | 79 | 91 | 89 | 74 | 23.1 | 22.8 |
| 4. Machete full | 4115 | 2002 | 367 | 608 | 94 | 84 | 87 | 78 | 22.9 | 23.0 |
| 5. Machete 3/4 | 3587 | 1725 | 334 | 650 | 96 | 75 | 91 | 70 | 22.8 | 23.0 |
| 6, Tok Granular full | 3469 | 1790 | 400 | 625 | 85 | 97 | 93 | 78 | 23.1 | 22.8 |
| 7, Tok Granular 3/4 | 4085 | 1588 | 400 | 625 | 89 | 77 | 88 | 79 | 23.1 | 23 0 |
| 8. Weedone full | 3792 | 1887 | 428 | 608 | 90 | 99 | 88 | 76 | 23.2 | 22.6 |
| 9. Weedone 3/4 | 3952 | 1746 | 344 | 625 | 94 | 88 | 89 | 69 | 22.8 | 22.6 |
| F. test | N.S | N.S | N.S | N.S | N.S | N.S | N.S | N.S | N S | N.S |
| S. Em ± | 361 | 128 | 75 | 55 | 13 | 11 | 7 | 7 | 0.3 | 0.3 |

A. Season 1 (Mundakan) B. Season 2 (Punja)

Table 2

**Effect of weedicides and intensity of hand weeding on weed growth Season 1 *(Mundakan)***

| Treatment | Dry weight of weeds at harvest (g/m²) | | Weed count at harvest-dicot/m² | | Weed count at harvest-monocot/m² | | Percentage spread of *Brachyra xp.* | | Percentage spread of *Salvinia sp.* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | A | B | A | B | A | B | A | B |
| I. Control (no weeding) | 143 | 176 | 2.7 | 2.2 | 31.9 | 25.9 | 44.0 | 11.0 | 11.0 | 11.0 |
| 2. Hand weeding twice | 108 | 136 | 33 3 | 2.6 | 18.6 | 22.6 | 0 0 | 22.0 | 0 0 | 0.0 |
| 3. Weed free | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4, Machete full | 166 | 94 | 0.0 | 7.3 | 59.9 | 26.2 | 44.0 | 22.0 | 0.0 | 22.0 |
| 5. Machete 3/4 | 131 | 74 | 5.3 | 8.2 | 4.0 | 22 1 | 11.0 | 33.0 | 11.0 | 0.0 |
| 6. Tok Granular full | 181 | 141 | 25.3 | 17.9 | 30.6 | 16.2 | 22.0 | 22.0 | 0.0 | 11.0 |
| 7. Tok Granular 3/4 | 147 | 123 | 9.3 | 10.2 | 30.6 | 4.1 | 22.0 | 11.0 | 22.0 | 33.0 |
| 8. Weedone-full | 132 | 162 | 1.3 | 13.1 | 89.1 | 17.7 | 0.0 | 11.0 | 33.0 | 11.0 |
| 9. Weedone 3/4 | 124 | 97 | 6.7 | 11.3 | 22.6 | 26.1 | 22.0 | 22.0 | ! 1.0 | 0.0 |
| F test | N.S | Sig | N.S | N.S | N.S | N.S | N.S | N.S | N.S | N.S |
| S. Em ± | 40 | — | 10.2 | 7.2 | 117.3 | 13.3 | 58.0 | 32.4 | 53.5 | 33.2 |
| C. D. (0,5) | | 19 | | — | | — | | -- | | |

A. Season 1 (Mundakan) B. Season 2 (Punja)

## Results and Discussion

Data on yield of grain and yield components of the first and second seasons are given in Table 1. As will be evident from the Table, the weedicides in any of the concentrations tried did not have significant effect on yield of rice or on yield contributing characters. Even the treatment of weed-free environment which was weeded at weekly intervals failed to record any superiority over the unweeded control. The extent of weed growth in the plots were so low that they probably failed to result in influencing the growth and yield of rice. Continuous flooded conditions were thus able to keep down weed growth to reasonably low levels. Such a system of flooding was maintained in the experiment as it was necessary for the effectiveness of the weedicides. Such a pattern of yield variation would thus suggest that under conditions of rice culture prevalent in the area, maintaining standing water in the field itself would adequately control weeds of rice. As shown by the data on the number of weeds (Table 2) there was no indication of any of the above chemicals having lethal phytotoxicity on the existing weed species especially on *Brachyra sp.* and *Salvinia auriculata* which were the dominant ones found surviving under the continuously flooded conditions. In terms of dry weight of weeds at harvest (Tables 2) significant treatment differences were noticed during the second season. However, the results were protracted and showed no distinct pattern of variation between treatments, thus making it difficult to draw any valid conclusion. Granular weedicides are reported to be forming a coating of the active ingredient over the soil surface thus killing the meristematic cells of the new undergrowlh. In the experiment under study, the number of such weeds was very low making an evaluation of the toxicity of the chemicals on them difficult. It may be noted that differences in weed counts of monocots and dicots between unweeded control and weed free environment also remained non.significant, The distribution of Brachyra *sp.* the spreading type of weed and *Salavinia auriculta,* the aquatic type were erratic and was found to follow no treatment variation. The error component in the observation on percentage area, occupied by them was raised so high as to mask treatment differences even between unweeded control and treatment of weed free enviornment.

## Summary

The field experiment was conducted in the farm attached to the Agricultural College, Vellayani frr a period of two seasons to evaluate the performance of three granular weedicides on the lethality of weeds of rice and on the growth and yield of rice. There was no effect on the growth and yield of rice or on number and dry weight of weeds. The differences between unweeded control and continuously hand weeded treatment also remained nonsignificant both in terms of rice yield and weed growth. This points to the fact that continuous water logging itself was effective in keeping down weed growth and in preventing the consequent effect on rice yield. There was no apparent toxicity of the chemicals on the existing weed species of the area.

സംഗ്രഹം

നെല്ലിലെ കളകളെ നശിപ്പിക്കുന്നതിനും, നെല്ലിന്റെ വളർച്ച, വിളവു് എന്നിവയെ സഹായിക്കുന്നതിനുമുള്ള പുതിയതായി വിപണിയിൽ ഇറക്കിയിട്ടുള്ള മൂന്നു ഗ്രൂപ്പിലുള്ള കളനാശിനികളുടെ കഴിവിനെപ്പറ്റി ഒരു താരതമ്യപഠനം വെള്ളായണി കാർഷിക കോളേജിൽ നടത്തുകയുണ്ടായി. നെല്ലിന്റെവളർച്ച, വിളവു് എന്നിവയെ സംബന്ധിച്ചിടത്തോളം ഈ കളനാശിനികൾക്കു് പങ്കില്ലെന്നു തെളിയുകയുണ്ടായി. കൂടാതെ, കളയെടുക്കാത്ത പ്ലോട്ടും തുടർച്ചയായി കൈകൊണ്ടു് കളയെടുത്ത പ്ലോട്ടും തമ്മിൽ വിളവിലോ, ചെടിയുടെ വളർച്ചയിലോ യാതൊരു വ്യത്യാസവുമില്ലായിരുന്നു. ഇതു് കാണിക്കുന്നതു് വയലുകളിൽ വെള്ളം നിറുത്തുന്നതു കൊണ്ടുമാത്രം കളകളുടെ വളർച്ചയെ നിയന്ത്രിച്ചുനിർത്താൻ കഴിയുമെന്നും അങ്ങനെ വിളവിനെ ബാധിക്കാതെ രക്ഷിക്കാൻ കഴിയുമെന്നുമാണു്.

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