

CONTROL OF WEEDS IN RICE FIELD USING ALLELOPATHY (an eco-friendly concept)

P. K. Biswas, S. M. Masum and S. K. Mahato¹

Extended Summary

The project was initiated during 2010 with the financial support of Ministry of Science and Information & Communication Technology (MSICT) of which the experiment entitled “Control of weeds in rice field using Allelopathy (an eco-friendly concept)” was conducted in *Aman* season, 2010. The objectives of the project was to evaluate the allelopathic potential of different naturally grown plants for controlling weeds and increasing rice production. Three rice varieties included in the study were BRRI dhan46, Guti Swarna and Ranjit that assigned to the main plot. Five Allelopathic treatments viz. Control (no allelopathic material), Lantena camera, Goose weed, Bon sarisha and Araich were in the sub-plots. The concentration of allelopathic materials was 0.50 kgm^{-2} . The 30 days old seedlings were transplanted on August 02, 2010 maintaining $25\text{cm} \times 15\text{cm}$ spacing with two seedlings/hill. Results showed that application of goose weed gave the lowest weed population ($184.11/\text{m}^2$) and dry weight (91.67 g/m^2) at 20 DAT whereas the lowest weed population at 40 DAT ($52.89/\text{m}^2$) was found in Araich treated plots (Table 1). The interaction of Guti swarna with Goose weed showed the lowest weeds ($138.67/\text{m}^2$) at 20 DAT and ($55.00/\text{m}^2$) at 40 DAT and dry weight (91.67 g/m^2) at 20 DAT and Ranjit with Bon sarisha (8.85 g/m^2) at 40 DAT. Variations of weeds due to different allelopathic materials was also reported by many researchers. The interaction of BRRI dhan46 along with Bon sarisha showed the highest number of tillers/hill (13.67) that similar to the same variety treated with Araich (13.33). The interaction of Ranjit with Araich treatment showed the highest panicle length (28.00 cm) that similar to the same variety treated with Lantena camera. In respect of grain weight, the variety BRRI dhan46 showed the highest grain weight (22.63 g) compared to the other two varieties. The Araich treated plants performed the highest grain weight (19.81 g) whereas the lowest 1000 grain weight by control treatment (16.72 g). The highest number of filled grains/panicle (256.00) was found in the variety Ranjit with Araich application. The variety Guti swarna (21.27) and no allelopathic materials (17.78) and their interaction (28.00) gave the highest unfilled grains/panicle. The highest grain yield (4.81 t/ha) was found in the variety BRRI dhan46 that similar to Ranjit (4.53 t/ha) and the Guti swarna gave the lowest yield (3.80 t/ha) that similar to Ranjit

¹ Professor, Dept. of Agronomy, Sher-e-Bangla Agricultural University, Dhaka-1207

(Table 2). Araich treated plants showed the highest grain yield (4.70 t/ha) that sarisha (4.41 t/ha) whereas the control treatment gave the lowest grain yield (4.18 t/ha) that similar to Goose weed treated plants (4.20 t/ha). The interaction of Ranjit and Araich gave the highest grain yield (5.26 t/ha) and the lowest grain yield (3.41 t/ha) by the variety Guti swarna with no Allelopathic materials (Fig. 1). Mamun *et al.* (2013) also reported the variation of rice yield with allelopathic material. The highest straw weight was given by the variety BRRRI dhan46 (9.70 t/ha), Bon sarisha (9.07 t/ha) that similar to control (8.88 t/ha), Goose weed (8.67 t/ha) and the interaction of Bon sarisha along with BRRRI dhan46 (10.37 t/ha) that similar to the same variety with all other allelopathic materials except Araich.

On the basis of the above results it may be concluded that the studied Allelopathic materials can control weeds where the Goose weed performed better in the early stage and Araich in the later stage of the crop. But for conclusive recommendation similar more experiments have to be undertaken with other Allelopathic materials on more Rice varieties in different locations.

Table 1. Effect of variety and allelopathic materials on number and dry weight of weeds/m² of Aman rice

Treatments	Number of weeds/m ² in rice field at		Dry weight of weeds/m ² in rice field at	
	20 DAT	40 DAT	20 DAT	40 DAT
Variety:				
V ₁	269.53	92.87	141.20	18.00
V ₂	219.40	62.60	103.40	14.47
V ₃	233.87	62.67	117.00	14.90
LSD _(0.05)	NS	NS	NS	NS
Allelopathic materials:				
M ₀	296.56	74.11	136.67	17.97
M ₁	282.00	74.00	126.22	18.62
M ₂	184.11	77.78	91.67	15.23
M ₃	215.22	84.78	118.22	13.28
M ₄	226.78	52.89	129.89	13.89
M ₄	89.990	20.763	34.077	NS
LSD _(0.05)				

V₁ = BRRRI dhan46, V₂ = Guti Swarna, V₃ = Ranjit,

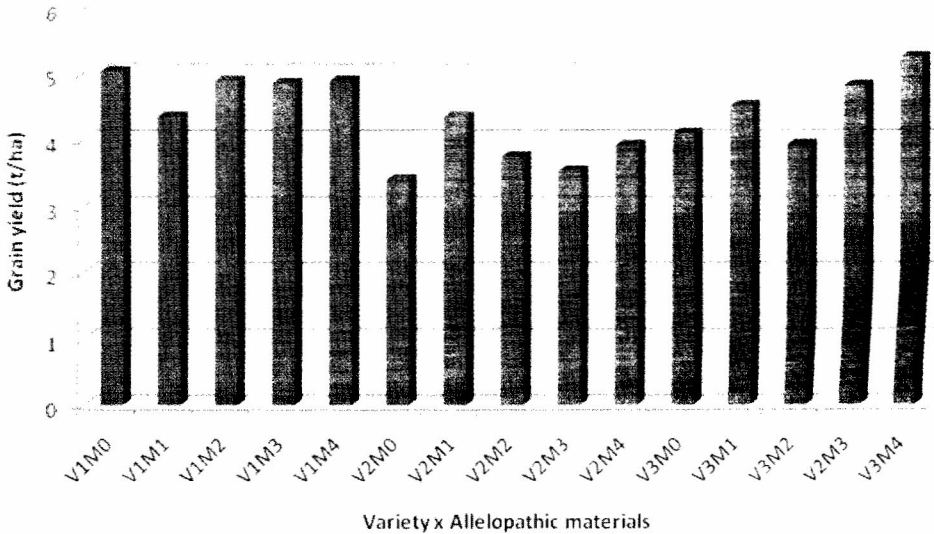
M₀ = Control, M₁ = Lantena camera M₂ = Goose weed, M₃ = Bon sarisha, M₄ = Araich

Table 2. Effect of variety and allelopathic material on yield attributes and yield of Aman rice

Treatments	Filled grains panicle ⁻¹ (No.)	Wt. of 1000 grains (g)	Grain yield (t ha ⁻¹)	Straw yield (t ha ⁻¹)
Variety:				
V ₁	200.33	22.63	4.81	9.70
V ₂	212.07	16.10	3.80	8.34
V ₃	219.33	16.29	4.53	7.75
LSD _(0.05)	56.246	0.541	0.902	1.009
Allelopathic materials:				
M ₀	199.78	16.72	4.18	8.88
M ₁	206.22	18.06	4.42	8.55
M ₂	212.33	18.61	4.20	8.67
M ₃	219.56	18.50	4.41	9.07
M ₄	215.00	19.81	4.70	7.81
LSD _(0.05)	28.915	0.631	0.467	1.013

V₁ = BRRI dhan46, V₂ = Guti Swarna, V₃ = Ranjit,

M₀ = Control, M₁ = Lantena camera M₂ = Goose weed, M₃ = Bon sarisha, M₄ = Araich



V₁ = BRRI dhan46, V₂ = Guti Swarna, V₃ = Ranjit,

M₀ = Control, M₁ = Lantena camera M₂ = Goose weed, M₃ = Bon sarisha, M₄ = Araich

Figure 1. Grain yield of rice as affected by variety and allelopathic materials