

ALLELOPATHIC EFFECT OF BRASSICA BIOMASS ON WEED CONTROL OF WHEAT

Dr. Parimal Kanti Biswas

Extended Summary

A two years research project was initiated from November, 2007 at Agronomy department, Sher-e-Bangla Agricultural University to study the allelopathic effect of *Brassica* spp. to control weeds in wheat field. The first experiment was assigned in a split-plot design where three cultivated *Brassica* spp. viz. *Brassica campestris*, *Brassica juncea* and *Brassica napus* were in the main plot and five different ways of biomass inclusion were in the sub-plot. The second experiment was comprises with three factors as previous crop conditions (fallow and mustard) were assigned in the main plot; two maturity date of *Brassica* biomass (25 days & 35 days) in the sub-plot and three levels of biomass concentration (0, 0.5 g/m² & 1.0 g/m²) in the sub-sub-plot. The *Brassica* crops were sown on November 2, 2007 for the first experiment and 01 and 12 November for the second year experiment. Wheat seeds were sown on using 20 cm line to line distance. Weed samples were collected two times on 30 DAS and 50 DAS for counting weed population and dry weight. Some weeds e.g., *Amaranthus spinosus*, *A. viridis*, *Lindernia procumbens*, *Heliotropium indicum*, *Polygonum hydropiper*, *Celosia argentea*, *Ageratum conyzoides*, *Brassica kaber* and *Digitaria ischaemum* were not found in the wheat field. Significantly, the highest weed dry matter (1.72 g/m²) was revealed in *Brassica juncea* plots at 30 DAS but in *Brassica napus* field (1.44 g/m²) at 50 DAS. The lowest weed dry matter (0.89 g/m²) was recorded in total incorporation of *Brassica* biomass to the soil. The interaction of *Brassica* species and ways of biomass incorporation revealed the highest (3.83 t/ha) grain yield of wheat in *Brassica juncea* spreading above ground.

The second year study showed the highest weed density (77.22 and 70.28 gm⁻² at 30 and 50 DAS, respectively) in 35 days old *Brassica* biomass incorporation. Weed population in wheat field was significantly reduced by the increasing of *Brassica* biomass concentration though previous crop condition had no influence on weed

population in wheat field. The wheat yield was not affected by the previous crop condition but the 25 days old *Brassica* biomass incorporation revealed the higher yield (1.61 t ha⁻¹) compared to 35 days (1.44 t ha⁻¹). Application of 1.0 kg m⁻² *Brassica* biomass showed the highest wheat yield (1.63 ha⁻¹) that followed by 0.5 kg m⁻² *Brassica* biomass (1.52 t ha⁻¹) and no *Brassica* biomass (1.42 t ha⁻¹).

Table 1. Weed density and weight in wheat as affected by Brassica biomass and methods of incorporation

Treatments	Weed density (no./m ²)		Weed dry weight (g/m ²)	
	30 DAS	50 DAS	30 DAS	50 DAS
Brassica species:				
S1	17.67	14.07	1.16	1.08
S2	25.60	20.20	1.72	0.96
S3	22.47	18.80	1.16	1.44
LSD _{0.05}	8.690	12.154	0.350	0.208
Ways of biomass incorporation:				
B1	26.78	17.78	1.49	1.66
B2	17.78	20.11	0.89	1.10
B3	26.89	20.89	1.59	1.31
B4	15.33	16.56	1.11	0.93
B5	22.78	13.11	1.65	0.80
LSD _{0.05}	9.425	12.847	0.534	0.491

S₁ = *B. campestris* S₂ = *B. juncea* S₃ = *B. napus*; B₁ = No biomass B₂ = Spreading above ground B₃ = mixed with soil B₄ = spreading in lines B₅ = 50% spreading + 50% mixed with soil

Table 2. Weed density and weight in wheat as affected by previous crop condition, age of Brassica and concentration Brassica biomass

Treatments	Weed density (no./m ²)		Weed dry weight (g/m ²)	
	30 DAS	50 DAS	30 DAS	50 DAS
Previous crop condition:				
Fallow	68.17	61.67	4.88	18.64
Brassica campestris	60.06	52.06	4.72	19.81
LSD _{0.05}	NS	NS	NS	NS
Age of Brassica plant:				
25 days	51.00	43.44	2.96	11.51
35 days	77.22	70.28	6.64	26.94
LSD _{0.05}	17.289	9.308	1.381	3.516
Biomass concentration:				
0	82.83	72.75	6.35	22.49
0.5 kg/m ²	59.92	53.83	4.41	18.93
1.0 kg/m ²	49.58	44.00	3.64	16.27
LSD _{0.05}	21.175	11.399	1.691	4.306