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YIELD PERFORMANCE OF MUNGBEAN GENOTYPES AS INFLUENCED BY HERBICIDES WITH DIFFERENT WEED MANAGEMENT PRACTICES

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Abstract. *This research was conducted to investigate the effect of different herbicides with weed management practices on growth and yield performance of mungbean genotypes. The experiment consisted of two factors were mungbean genotypes and weed management. There were two genotypes namely BARI Mung 6 and BARI Mung 8. While there were five weed management practices namely control/no weeding and without herbicide application (T1), hand weeding at 20 and 40 DAS (T2), pre emergence herbicide (Panida) at 1-2 DAS (T3), pre emergence herbicide (Neon) at 2-3 DAS (T4), and post emergence herbicide (Neon) at 10-15 DAS+hand weeding (T5). The results revealed that BARI Mung 6 stand superior to BARI Mung 8 in respect of dry matter content/plant, pods/plant, seeds/plant, seed yield, and 1000 seed weight. Among weed management practices, maximum plant height (53.70 cm), dry matter weight/plant (17.96 g), pods/plant (18.31), seeds/plant (171.47), maximum weed control efficiency (33.78 %) obtained from T3 treatment. Based on the interaction effect showed that BARI Mung 6 weeded with pre emergence herbicide (Panida) at 1-2 DAS produced maximum seed yield (1.79 t/ha) as well as yield attributes showed 2.29 % higher seed yield.*
Keywords: yield performance; weed management practices; mungbean crop

1. Introduction

Pulses play a significant role in rainfed agriculture and in average Bangladeshi diets. Major pulse crops grown in Bangladesh are grass peas, lentils, mungbeans, blackgrams and chickpeas. They occupy 93% of the total area under pulses and contribute more than 97 % to total pulse production in the country (Hossain *et al*., 2016). Per capita requirement of pulse by human should be 80g, whereas it is only produced about 10.0 g in Bangladesh (BBS, 2015). Thus, the ideal cereal to pulse ratio (10:1) is not maintained which is now 30:1. This is fact that national production of the pulses is not adequate to meet up the population demand. So, to meet the suggested requirement of pulses production is to be increased even more than four folds (BBS, 2010).

Mungbean (*Vigna radiata* L.) is one kind of highly vital indigenous vegetable legume pulse crops in South Eastern Asia. Khattak *et al*. ,(2003) reported being mungbean crop is plentiful with edible protein (24%), it is used in the cereal-based foods. It comprises vitamin A (94 mg), iron (7.3 mg), zinc (3 mg), calcium (124 mg) and folate (549 mg) per 100 g dry seed hence it is utilized in splitting shape (Dhal) and in further various foodstuffs (Rasul *et al*., 2012). After wheat cropping

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system, barren time of 70-90 days (April to June) in rice crop it is appropriate to grow a catch crop of mungbean. Remaining minimal input needing, rapid period, high-level benefit crop and curative crop, mungbean, obtain its place in rice-wheat and another crop rotation (Achakzai *et al*., 2012). Like mungbean a leguminous crop fixes nitrogen thus enhancing soil richness and necessitates relatively slighter irrigation compare several field crops (Khan *et al*., 2008).

Weed is the most crucial reason liable for minimum yield of pulse crops (Islam *et al*., 2009). Mungbean is not extremely aggressive against weed hence weed management is necessary for production (Moody, 1999). However, such relationship (leaf area, dry matter production, harvest index, yield) may be changed for mungbean which is in competition with weed for solar radiation, nutrients, and moisture. Therefore, the judicial weed management in mungbean cultivation is an essential aspect that greatly influences the growth, development, and yield. Weeds can be tested by accepting several practices as eco-physical, natural, biological, and in recent times over direct and indirect method i.e., integrated weed management. Therefore, the main objectives of this research article was to assess yield and yield attributes of mungbean under the various weed management practices and to obtain the finest possible weed management practices based on weed eradicating efficacy in cultivating of mungbean.

2. Material and Method

Experimentation was done at the Agronomy field of Hajee Mohammad Danesh Science and Technology University, Dinajpur, Bangladesh through the period from (March to May) 2016. Experimental site was characterized under the sub-tropical weather and climate by three distinct seasons with medium high land containing soil pH 5.6, organic carbon 0.45%, temperatures differed from March to May (35.1°C to 28.5°C), humidity (53.7% to 78%), and rainfall (58mm-150mm). This location contained latitude, longitude, and elevation from sea level (25.6279° N, 88.6332° E, and 37m). The experiment set up in RCBD with three replications. Trial field separated into 3 blocks where each block split into 10 plots containing size of the unit plot was 4m × 2.5m area. Seeds placed in rows having distance 30 cm and depth of 2-3 cm. BARI Mung-6 and BARI Mung-8 genotypes are suitable for summer season. Plant height ranges for BARI Mung-6 and BARI Mung-8 (40-45 and 55-60) cm; life cycle (55-58 and 60-62) DAS; average yield (2-2.1 and 1.6-1.7 t/ha). There were five treatments in this research, namely, control (no weeding and without herbicide application) (T1), hand weeding at 20 and 40 DAS (T2), pre emergence herbicide (Panida) at 1-2 DAS (T3), pre emergence herbicide (Neon) at 2-3 DAS (T4) and post emergence herbicide (Neon) at 10-15 DAS + hand weeding (T5). Weeding was done as per treatments at 8 DAS and next at 15 DAS. Two irrigations at 10 and 30 DAS were done. The insecticide Malathion 57 EC was sprayed of 1.5 l/ha at the time of 50% pod formation stage to control pod borer. The basal fertilizer dose was applied during final land preparation. Urea (46% N_2), TSP (20% P_2O_5) and MoP (50% K_2O) were used as sources of N-P-K (30-48-30 kg/ha) All the fertilizers were employed as a basal dose during finishing land preparation. For the estimation of Crop Growth Rate (CGR), Relative Growth Rate (RGR), Weed Infestation Intensity (WII), Weed Control Efficiency (WCE) and Harvest Index (HI) following equations were used (1-5).

$$CGR= \frac{1}{GA} \times \frac{W2-W1}{T2-T1} \text{ g/m}^2\text{/day} \quad (1)$$

$$RGR= \frac{LnW2 - LnW1}{T2-T1} \text{ g/g/day} \quad (2)$$

Where,
GA = Ground area (m^2)
W_1=Total dry weight at previous sampling date
W_2=Total dry weight at current sampling date
T_1=Date of previous sampling
T_2=Date of present sampling
Ln=Natural logarithm

$$WII= \frac{Absolute\ density\ of\ a\ given\ weed\ species/area(m)}{Absolute\ density\ of\ the\ crop\ plant/area(m)} \times 100 \quad (3)$$

$$WCE = \frac{Maximum\ number\ of\ weed\ found\ in\ a\ plot - Number\ of\ weed\ in\ treated\ plot}{Maximum\ number\ of\ weed\ found\ in\ a\ plot} \times 100 \quad (4)$$

$$HI\ (\%)= \frac{Grain\ yield}{Biological\ yield} \times 100 \quad (5)$$

2.1. Determination of maturity

While 80% of the pods became brown in colour, crop was measured maturity and collected was done from inner 1.0 m^2 area of each plot on different dates. Five randomly selected plants from every plot were pull up carefully for data record. Collected parameters were plant height (cm), plant dry matter (gm), branches/ plant (no.), pods/plant (no.) seeds/ pod (no.) seeds number /plant (no.), 1000 seed weight (g), crop growth rate (g/m^2/day), relative growth rate (g/g/day), intensity of weed infestation, weed biomass/ plot, weed control efficiency, stover yield (t/ha), seed yield (t/ha), biological yield (t/ha) and harvest index (%).

2.2. Statistical analysis

Data were analysed statistically as per the design used following the analysis of variance (ANOVA) technique and the mean differences were adjusted with DMRT at 5% level of significance using the statistical computer package program, MSTAT-C (Russel,1986).

3. Results and Discussion

3.1. Growth performance of mungbean on several weed management practices

3.1.1. Plant height on genotypes and weed managements

The plant height was affected due to different genotypic after sowing. Plant height varied significantly for the genotypes (Table 1). The highest plant (59.06 cm) was noted from BARI Mung 8 and shortest (45.66 cm) from BARI Mung 6. Plant height depends on its varietal characteristics which was very much related with the outcomes of (Khan *et al*., 2008; Raj & Tripathi, 2005) genotype K-851 gave significantly higher values for plant height compared with RMG-62 which is inversely proportional to weeds density and dry weight. Different weed managements showed significantly different on plant height. The tallest plant (53.70 cm) was observed from T_3 while shortest (50.02 cm) from T_1 (Table 2). This result indicated that plant height expanded with the application of different weed control methods. Reduced plant height in no weeding might be due to inhibition of cell division and enlargement. This finding similar with (Khan *et al*., 2014) that is increase in plant height is inversely proportional to weeds density and dry weight.

Table 1. Single analysis of variance with morphological attributes of mungbean Genotypes

Genotypes	Plant height (cm)	Dry matter weight (g)	Branches number /plant (no.)	Pods number /plant (no.)	Seeds number/ Pod (no.)	Seeds number/ Plant (no.)	1000 seeds weight (g)
BARI Mung 6	45.66b	17.17a	4.02a	15.71a	9.21a	148.87a	46.68a
BARI Mung 8	59.06a	17.02a	3.93a	15.54b	8.68b	131.71	30.74b
Level of significant	**	ns	ns	**	**	**	**
CV (%)	0.38	1.16	7.76	4.75	6.54	11.34	0.51

Values having same letter (s) do not differ significantly by DMRT at P<5% level
** Highly significant (p≤ 1%) and *significant (p≤ 5%)

3.1.2. Dry matter weight (g) on genotypes and weed managements

Above ground dry matter/plant showed non-significant variation for genotypes (Table 1). and significant variation for different weed management (Table 2). There was trend to increase dry matter/plant with the advancement of days, but definite trend was not followed in genotypes. Rahman (2011) reported highest dry matter production was found in high yielding mungbean genotypes of BINA moog 2 and lowest in local. Dry matter/plant was maximum (17.96 g) in T_3. Treatment T_1 gave minimum dry matter (16.15g) in Table 2. Kumar *et. al.,* (2014) noticed that weed biomass improved and mungbean yield reduced with delay in weeding i.e., if weed elimination at 30 and 40 days after sowing.

3.1.3. Branches Number / Plants on genotypes and weed managements

Table 1 showed maximum branches number/plant was found from BARI Mung 6 (4.02) and BARI Mung 8 (3.93). Based on their varietal characters that was governed by genetic background produced maximum number of branches/plants. Previous findings suggested that management practices influence branches number /plant but genotype itself manipulated branches number /hills. Khan *et al.* (2011) reported with two genotypes (Partow and Gohar) and a line of mungbean (VC-1973A) where line was superior other genotype due to its branch number/ plant of mungbean.

Table 2. Single analysis of variance with morphological attributes for different weed managements

Treatments	Plant height (cm)	Dry matter weight (g)	Branches no/Plant (no.)	Pods no/Plant (no.)	Seeds no/Pods (no.)	Seeds no/plant (no.)	1000 seed weight (g)
T1	50.02c	16.15b	3.44b	12.02c	8.49b	100.24e	37.79c
T2	50.54c	16.25b	4.26a	17.59b	8.23b	123.00d	39.11a
T3	53.70a	17.96a	4.39a	18.31a	9.17a	171.47a	38.76b
T4	52.27b	17.00a	3.59a	17.66b	9.00a	168.45b	39.00a
T5	52.11b	17.23a	4.20a	18.11a	8.88b	145.34c	39.24a
Level of significant	**	**	**	**	ns	**	ns
CV (%)	2.34	0.63	2.63	2.45	0.01	2.44	0.03

Values having same letter (s) do not differ significantly by DMRT at P<5% level
** Highly significant (p≤ 1%) and *significant (p≤ 5%)

Branches number/plants showed significant variation for different weed managements. Maximum (4.39) was recorded from T3 replication and T1(3.44) (Table 2). Branches/plants varied for different weed management practices based upon the growth and net assimilation rate. Muhammad *et al.* (2014) stated that weeding was utilized two times, i.e., at 10 and 35 DAS considerably influenced branches number / plants.

3.1.4. Pods Number / Plants on genotypes and weed managements

Significant variation of pods number/plants was recorded for both genotypes and weed managements practices in Table 1. Higher pods number /plants (15.71) from BARI Mung 6, whereas the lower (15.54) from BARI Mung 8. Different genotypes responded differently due to genetically characters and the prevailing environment during the growing season. Raj and Tripathi (2005) reported that cultivar K-851 gave significantly higher values for pods/ plants compared with RMG-62. The highest (18.31) was found from T3 and lowest (12.02) from T1 weed management practices in Table 2. Bayan and Saharia (1996) reported that pods/plant was significantly influenced by weed management.

3.1.5. Seeds Number /Pods on genotypes and weed managements

The highest of seeds number/pods was recorded from BARI Mung 6 (9.21) whereas BARI Mung 8 was 8.68 (Table 1). Zahir *et al.,* (2016) recorded highest number of seeds/pod (9.43) with BARI Mung 6. There was non-significant relation for seeds number/pod with weed managements. The highest (9.17) was recorded from T3 whereas T1 showed lowest seeds/pod (8.49). Akter *et al.,* (2013) reported the highest seeds number (17.07) /pod from three-stage weeding in mungbean.

3.1.6. Seeds Number/ Plants on genotypes and weed management

Table 1 showed highest seeds number/plants (148.87) observed from BARI Mung 6 while lower (131.71) from BARI Mung 8 and showed significant relation. Sarkar and Mondal. (2013) recorded the highest seeds number /plants (140.43) from BARI Mung 7. Significant variation was recorded for different weed managements. The maximum seeds (171.47) was obtained from T3 and lowest (100.24) from T1. Zahir *et al.,* (2016) also recorded the highest (138.22) with four stages hand weeding.

3.1.7. Seeds Weight on genotypes and weed managements

Genotypes significantly influenced by 1000 seeds weight. The highest (46.68 g) was observed from BARI Mung 6 and lowest (30.74 g) from BARI Mung 8 (Table 1). Raj and Tripathi (2005) reported that cultivar K-851 gave significantly higher values for 1000 seed weight compared with RMG-62. Statistically non-significant variation was observed of 1000 seeds weight due to different weed managements. The highest (39.24 g) was recorded from T5 and lowest (37.79 g) from T1 (Table 2). Muhammad *et al.,* (2014) also reported weeding at 10 and 35 DAS drastically influenced 1000-grain weight.

Table 3. Genotypic effects on Crop Growth Rate

Genotypes	Crop Growth Rate (g/m^2/day)		
	10-20 DAS	30-40 DAS	50-60 DAS
BARI Mung 6	2.94b	7.00b	8.11a
BARI Mung 8	3.06a	7.52a	8.27a
Level of significant	*	*	ns
CV (%)	2.77	1.65	1.69

Values having same letter (s) do not differ significantly by DMRT at P<5% level
** Highly significant (p≤ 1%) and *significant (p≤ 5%)

3.1.8. Physiological parameters Crop Growth Rate (CGR) on genotypes

CGR varied significantly with genotypes at different growth stages of mungbean (Table 3). There was trend to increase CGR (Mondal *et al*., 2012 and Lema *et al*., 2018) with advancement of days from 10-20; 30-40; 50-60 whereas maximum at 50-60 DAS was 8.27 g/m^2/day for BARI Mung 8 and minimum at 50-60 DAS was 8.11 g/m^2/day for BARI Mung 6.

3.2 Physiological performance of mungbean on several weed management practices

3.2.1. Physiological parameters Relative Growth Rate (RGR) on weed managements

RGR for different weed managements at 10-20, 30-40 and 50-60 DAS was found significant (Table 4). At 10-20 DAS, maximum (0.17 g/g/day) RGR was observed from T3, minimum (0.13 g/g/day) from T1. At 30-40 DAS, the highest (0.10 g/g/day) RGR was recorded from T3, while minimum (0.07 g/g/day) from T1 and T4. At 50-60 DAS, maximum (0.02 g/g/day) RGR from T2, T3 and T4 while minimum (0.01 g/g/day) from T1 and T5. Mondal *et al.* (2012) observed same results for six mungbean genotypes of which three highest (BARI mung-4, BINA mung-7, and BUmung-1) and three low (BARI mung-6, BINA mung-6, and BUmung-2) yielding genotypes 0.16 g/g/day for BUmung-2.

3.2.2. Weed Infestation Intensity on genotypes and weed managements

Significant variation was recorded of weed infestation intensity for both genotypes and weed managements. For genotypes, maximum (19.47 %) was recorded from BARI Mung 8 and minimum (19.39 %) from BARI Mung 6 (Table 5). In occasion of weed managements, maximum (26.50) was recorded from T4, and lowest (0.00) from T1 due to no weed management practices (Table 6). Ramesh *et al.,* (2014) reported that weed infestation intensity significantly influenced by weed managements.

Table 4. Weed managements effect on Relative Growth Rate

Treatments	Relative Growth Rate (g/g/day)		
	10-20 DAS	30-40 DAS	50-60 DAS
T1	0.13c	0.07b	0.01a
T2	0.15b	0.09a	0.02a
T3	0.17a	0.10a	0.02a
T4	0.16b	0.07b	0.02a
T5	0.16b	0.08c	0.01a
Level of significant	**	**	ns
CV (%)	4.48	13.55	36.22

Values having same letter (s) do not differ significantly by DMRT at P<5% level
** Highly significant (p≤ 1%) and * significant (p≤ 5%)

3.2.3. Weed biomass/ plot (g) on genotypes and weed management

Dry weight/plot showed non-significant for genotypes (Table 5) while significant differences among the weed management treatments (Table 6). The maximum (223.20 g) was recorded with BARI Mung 8 and minimum (221.83 g) with BARI Mung 6. The highest weed biomass/plot (402.39) was recorded from T1 and lowest (70.87) from T3 due to no weed management practices (Table 6). Khan *et al*., (2011) and Muhammad *et al.,* (2014) stated that weeding at 10 and 35 days after sowing significantly affected weed biomass/plot.

3.2.4. Weed Control Efficiency (WCE) on genotypes and weed managements

Genotypes had non-significant variation while weed management significant differences among the treatments (Table 5). The maximum (18.98) was recorded from BARI Mung 8 and minimum (18.59) from BARI Mung 6. Taj *et al.,* (2003) reported that higher seed rate of HY varieties of mungbean significantly control weed infestation. The highest weed control efficiency (33.78 %) was noted from T3 and lowest (0.00 %) from T1 due to no weed management practices (Table 6). Singh *et al*., (2001) found that combination of mechanical and chemical weed control practices efficiently controls weed infestation.

Table 5. Effect of weeding parameters (weed infestation intensity, weed biomass, weed control efficiency) on genotypes

Genotypes	Weed Infestation Intensity (%)	Weed biomass/plot (g)	Weed control efficiency (%)
BARI Mung 6	19.39a	221.83b	18.59a
BARI Mung 8	19.47a	223.20a	18.98a
Level of significant	**	ns	ns
CV	2.01	1.18	1.04

Values having same letter (s) do not differ significantly by DMRT at P<5% level
** Highly significant (p≤ 1%) and * significant (p≤ 5%)

Table 6. Effect of weed management practices on weed attributes

Treatment	Intensity of weed infestation (%)	Weed biomass/plot (g)	Weed control efficiency (%)
T1	0.00d	402.39a	0.00e
T2	24.14b	113.85d	23.48b
T3	20.27c	70.87e	33.78a
T4	26.50a	322.92b	17.88d
T5	26.25a	202.56c	18.80c
Level of significant	**	**	**
CV (%)	2.34	0.63	2.63

Values having same letter (s) do not differ significantly by DMRT at P<5% level
** Highly significant (p≤ 1%) and *significant (p≤ 5%)

3.3 Yield performance of mungbean on several weed management practices

3.3.1. Stover yield (t/ha) on genotypes and weed managements

Table 7 shown statistically significant variation was recorded for stover yield of the genotypes. Highest (2.19 t/ha) was recorded from BARI Mung 8 while lowest (2.11 t /ha) from Mung 6. Bhati *et al.,* (2005) reported that mungbean cv. PDM-54 showed 13.7% higher fodder yield than the local cultivar. The highest (2.46 t/ha) was observed from T3 while the lowest (1.74 t/ha) from T1 (no weeding + no herbicide) application. Riaz *et al*., (2007) found that mungbean in different cropping patterns showed maximum yield for weeding at 25 and 40 DAS.

Table 7. Effect of yield attributes on genotypes and weed managements

Yield Attributes	Genotypes		Treatments				
	BARI Mung 6	BARI Mung 8	T1	T2	T3	T4	T5
Stover yield	2.11	2.19	1.74	2.00	2.46	2.22	2.09
Seed yield	1.94	1.61	1.75	1.76	1.79	1.76	1.77
Biological yield	3.42	3.37	3.19	3.48	3.22	3.26	3.30
Harvest index	43.09	43.23	32.32	40.00	43.74	42.70	38.43
Significant Level	**	**	**	**	**	**	**
CV%	1.12	0.07	1.02	3.03	1.00	2.25	2.12

** Highly significant ($p \leq 1\%$) and *significant ($p \leq 5\%$)

3.3.2. Seed yield (t/ha) on genotypes and weed managements

Significant variation was recorded for seed yield for the genotypes. The higher seed yield (1.94 t/ha) was observed from BARI Mung 6, whereas lowest (1.61 t/ha) was BARI Mung 8 (Table 7). Bhati *et al*., (2005) showed that K-851 provided superior yield compared to Asha and the local genotypes. Different weed managements showed significant variation on seed yield of mungbean. The higher seed yield (1.79 t/ha) was achieved from T3 whereas lowest (1.75 t/ha) from T1 (no weeding). Yield losses due to uninhibited weed growth in mungbean varies from 27 to 100%. Muhammad *et al.,* (2014) stated that weeding at 10 and 35 DAS significantly affected grain yield.

3.3.3. Biological yield (t/ha) on genotypes and weed managements

Table 7 shown statistically significant variation was recorded for biological yield of BARI Mung 6 and BARI Mung 8. The higher biological yield (3.42 t/ha) was recorded from BARI Mung 6 and lower (3.37 t/ha) from BARI Mung 8. Kohli *et al*., (2006) reported that mungbean genotypes BINA moog-5 done better than that of BINA moog-4 in context of biological yield. Biological yield of mungbean varied significantly for different weed managements. The highest (3.48 t/ha) was observed from T2 while lowest (3.19 t/ha) from T1 (no weeding+ no herbicide) application.

Muhammad *et al*., (2014) described that weeding at 15 and 30 DAS significantly affected biological yield.

3.3.4. Harvest index (%) on Genotypes and weed management

Significant variation was recorded for harvest index both genotypes and wed managements. The numeric maximum (43.23 %) was recorded from BARI Mung 8 and minimum (43.09 %) from BARI Mung 6 (Table 7). Similar results were found by Islam (2005). The maximum harvest index (43.74 %) was observed from T3 and minimum (42.70 %) from T4. Khaliq *et al.,* (2002) reported that harvest index was significantly affected by different weed management strategies.

3.4. Interaction effect between genotypes and weed management procedures on yield performance

3.4.1. Interaction of stover yield on genotypic effect and weed managements

Genotypes and weed managements showed significant differences on stover yield of mungbean due to interaction effect (Table 8). Highest (2.49 t/ha) was observed from V2T3 whereas the lowest stover yield from V2T1 (1.69 t/ha). Bhati *et al.,* (2005) reported that mungbean cv. PDM-54 showed 13.7% greater fodder yield compared to the local genotype for weeding at 25 and 40 DAS.

3.4.2. Interaction of seed yield on genotypes and weed managements

Interaction effect of mungbean genotypes and weed managements showed significant differences on seed yield of mungbean (Table 8). The maximum (1.95 t/ha) was recorded from V1T3 and V1T5. The lowest (1.60) from V2T1. Moody *et al.,* (1999) recorded that the cultivar Pusa Vishal recorded higher grain yield (1.63 t/ha) compared to cv. Pusa 105.

3.4.3. Interaction of biological yield on genotypes and weed managements

Genotypes and weed managements showed non-significant differences on biological yield of mungbean owed interaction effect (Table 8). The highest (3.53 t/ha) was observed from V1T3, whereas lowest V2T1 (3.14 t/ha). Bhati e*t al*., (2005) reported that mungbean cv. PDM-54 showed 13.7% greater biological yield compared to the local genotype for weeding at 25 and 40 DAS.

3.4.4. Interaction effect of harvest index on genotypes and weed managements

Interaction showed non-significant on harvest index of mungbean (Table 8). The maximum (43.98 %) was observed from V1T3 and minimum V1T4 (42.48 %). Khan *et al*. (2011) reported that harvest index was significantly affected by different weed management strategies with chemical weed control by panaida, Paraxon and Hammer.

Table 8. Interaction effect of genotypes and weed managements on yield and yield attributing parameters

Treatment	Stover yield (t/ha)	Seed yield (t/ha)	Biological yield (t/ha)	Harvest index (%)
V1T1	1.78e	1.91b	3.24a	42.82a
V1T2	2.44a	1.94a	3.47a	43.21a
V1T3	2.44a	1.95a	3.53a	43.98a
V1T4	2.09cd	1.93a	3.38a	42.48a
V1T5	2.23b	1.95a	3.47a	42.95a
V2T1	1.69e	1.60d	3.14a	43.06a
V2T2	2.16bc	1.61cd	3.48a	43.47a
V2T3	2.49a	1.62c	3.42a	43.50a
V2T4	1.99d	1.61cd	3.34a	42.92a
V2T5	2.21b	1.61cd	3.45a	43.21a
Level of significant	*	**	ns	ns
CV (%)	3.34	0.84	1.83	0.93

Here, V means variety and T means treatment

Values having same letter (s) do not differ significantly by DMRT at P<5% level

** Highly significant (p≤ 1%) and *significant (p≤ 5%)

4. Conclusion

Result showed that maximum plant height, branches number/plant and leaves number /plant was recorded from pre emergence herbicide (Panida) at 1-2 DAS. The highest dry matter content/plant (17.96 g) was recorded in T3; highest CGR and RGR (8.92 $g/m^2/day$ and 0.33 g/g/day) was recorded in T4 and T1treatments. Genotype BARI Mung 6 showed maximum performance compared to BARI Mung 8 for dry matter content/plant, pods/plants, seeds/plant, seed yield and 1000 seed weight. Among weed management practices, maximum plant height, branches number/plant, leaves number/ plant, dry matter weight/plant, pods/plants, seeds/plants, weed control efficiency obtained from T3 treatment. Under interaction effect, BARI Mung 6 weeded with pre emergence herbicide (Panida) at 1-2 DAS produced highest seed yield (1.79 t/ha), yield attributes and showed best performance. However, as far as weed control and yield of mungbean was concerned with hand weeding at 20; 40 DAS and post emergence herbicide (Neon) at 10-15 DAS+hand weeding also showed better result. Based on this research results, it may be concluded that effective weed control increases growth and yield of mungbean. Pre emergence herbicide (Panida) at 1-2 DAS can be treated as the best treatment for wider acceptability and can be repeated at different agro-ecological zones of the country.

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