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Determining Biological Yield Potential of Different Mungbean Cultivars

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Abstract: Comparative yield potential of different Mungbean (*Vigna radiata*) cultivars; Mung No-6601, NM-92, NM-98, NARC-Mung-1 and Chakwal Mung-97 was studied in randomized complete block design using a net plot size of $2 \times 5 \text{ m}^2$. The results indicated that cultivar NM-98 expressed the maximum number of branches per plant, number of pods per plant, number of grains per pod which lead to produce the maximum biological and grain yield per hectare as compared to all other cultivars in the test. However, cultivar NM-92 exhibited relatively higher seed protein content.

Key words: Mungbean cultivars, yield potential

Introduction

Mungbean an important grain legume crop fetches premium over other pulses of the country due to more palatable, highly nutritive, easily digestible and non-flatulent. It is considered a balanced diet when taken in combination with cereals (Considine, 1982) and plays an important role in improving soil fertility through biological nitrogen fixation. In Pakistan, total area under Mungbean was 196.90 thousand hectares with total grain production of 91.50 thousand tons and average yield $452.63 \text{ kg ha}^{-1}$ (Anonymous, 1999).

Low yield ha^{-1} in Pakistan may be attributed to low genetic yield potential of the varieties and also less achieved yield per unit area because of exercising conventional production technology. Hence cultivars performing better in terms of yield are required for improving the seed yield per unit area. Razaq (1995) found that Mung-6601 gave 14.48% higher seed yield than NM-51, NM-54 and NM-92. Higher seed yield was also recorded in NM-21-25 over NM-92, Mung 6601 and NM-19-19 (Hussain, 1996). While NM-96 was found better than NM-94 in terms of yield and yield parameters (Saeed, 1997). Similarly, in a comparative study of six Mungbean cultivars, NM-92 was found better in terms of yield and yield components.

Amir (1999) also reported that cultivars varied significantly in yield components. Keeping in view the varied potential of different cultivars, it was felt a dire need to compare the yield potential of different Mungbean cultivars, to find the best.

Materials and Methods

The studies pertaining to determine production efficiency of Mungbean cultivars were conducted at the Agronomic Research Area, University of Agriculture, Faisalabad, during autumn of 1999. The experiment was laid out in randomized complete block design and net plot size of $2 \times 5 \text{ m}^2$. The Mungbean genotypes included in the experiment were Mung No. 6601, NM-92, NM-98, NARC-Mung-1 and Chakwal Mung-97. The crop was sown on 27th of July with the help of a single row hand drill in 40 cm apart rows using 25 kg seed

rate ha^{-1} . A basal dose of 30-60 kg NP ha^{-1} was applied in the form of urea and triple super phosphate, respectively. The data on growth and yield parameters were recorded by using the standard procedures. The data were analyzed statistically by Fisher's analysis of variance technique. The least significant difference (LSD) test at 5% probability level was used to test the significance of differences among the treatment means (Steel and Torrie, 1984).

Results and Discussion

It was observed that different cultivars had significant effect on number of pods per plant (Table 1). Maximum number of pods per plant were observed in NM-98 (28.13) followed by NM-92 (25.35), while the minimum were recorded in NARC-Mung-1 (18.77). It might be due to genetic make up of cultivars. It was observed that number of grains per pod differed significantly among the cultivars. The maximum number of grains per pod were recorded in NM-98 (10.77), which was statistically at par with Chakwal Mung 97 (10.72). Minimum number of grains were recorded in case of cultivar Mung No. 6601 (7.08). These results are in line with those of Razaq (1995) who observed that cultivars differed significantly in number of grains per pod.

Data further revealed that 1000-grain weight was significantly affected by the cultivars. Maximum 1000-grain weight was recorded in NM-92 (52.65 g) followed by NM-98 (40.64 g) while the minimum 1000-grain weight (30.19 g) was recorded in cultivar NARC Mung-1. Zaidi (1998) also concluded that Mungbean cultivars had significant effect on 1000-grain weight.

Data further revealed that biological yield differed significantly among the cultivars. Maximum biological yield was recorded in NM-98 (5785 kg ha^{-1}) followed by NM-92 (5352 kg ha^{-1}) while the minimum biological yield was obtained in NARC Mung-1 (5065 kg ha^{-1}).

These results are in line with Malik *et al.* (1986), Chaudhry *et al.* (1994) and Waheed (1996) who observed that cultivars had significant effect on biological yield.

Table 1: Yield parameters reflecting comparative yield potential of different Mungbean cultivars

Treatments	No. of pods per plant	No. of grains per pod	1000-grain weight (g)	Biological yield (kg ha^{-1})	Grain yield (kg ha^{-1})	Harvest index (%)	Seed protein contents (%)
Mung No. 6601	21.65C	7.08D	37.13C	5101.00C	752.70C	14.76C	23.53B
NM-92	25.35B	9.58C	52.65A	5352.00B	905.20B	16.91B	25.15A
NM-98	28.13A	10.77A	40.64B	5785.00A	1031.00A	17.82A	24.07B
NARC Mung-1	18.77D	10.29B	30.19D	5065.00C	627.50D	12.40D	24.11AB
Chakwal Mung-97	19.25D	10.72A	33.98C	5091.00C	665.00D	13.07D	23.18B
LSD Value At 5%	2.09	0.34	3.30	48.29	104.60	1.07	1.07

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Cultivars had also a significant effect on grain yield. NM-98 produced the maximum grain yield (1031 kg ha⁻¹). While NARC-Mung-1 produced minimum grain yield (627.50 kg ha⁻¹). Higher grain yield in cultivar NM-98 was attributed to more number of pods per plant and number of grains per pod. Bilal (1994) and Hanif (1994) also reported that Mungbean cultivars showed significant differences in grain yield.

Harvest index was also found to be differing significantly in different cultivars. Where NM-98 recorded highest harvest index (17.82%), while minimum harvest index was noted in NARC Mung-1 (12.40%). These results are similar with those of Waheed (1996) and Saeed (1997) who found different Mungbean cultivars affecting harvest index significantly. It was also observed that protein contents were significantly different among cultivars. Maximum protein contents were recorded in CV. NM-92 (25.15%), which was statistically at par with NARC-Mung-1 (24.11%). Minimum seed protein contents were recorded in cultivar Chakwal Mung-97. Rehman (1988) also observed significant difference of protein contents in Mungbean cultivars.

It can be concluded from the present study that NM-98 appeared to be the best among the cultivars under test in terms of number of pods, number of grains per pod and grain yield per hectare.

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