



Performance evaluation of mung bean (*Vigna radiate*) genotypes for agronomic and phenology traits at North-West Ethiopia

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Abstract

Performance evaluation of Mung bean (*Vigna radiate*) genotypes for agronomic and phenology traits was conducted during 2013-2015 cropping seasons at Guba district, North-West, Ethiopia under rainfall condition with the objective, to test and evaluate the adaptability and performance of eight mung bean genotypes with standard check shoa robit. The agronomic traits evaluated and tested were stand count at initial, days to flowering, days to maturity, plant height, stand count at harvest, pods per plant, seeds per pod, hundred seed weight and grain yield per hectare. There was significant difference between treatments at (Pvalue < 0.05 level). The highest grain yield obtained from Black Bean (1416.26 kg/ha) while the lowest grain yield was scored by MBBR-1 (1074.78 kg/ha). Black Bean (27.20) scored the highest pods per plant whereas MB6173-B-33 scored the lowest (10.89); this implied genotype Black Bean was high grain yielder among the tested mung bean genotypes for this study. Correlation among quantitative traits was mostly positive; except days to maturity, and seeds per pod. Based on the performance, at field condition, variation occurred among the tested mung bean genotypes; therefore, the performance evaluation of mung bean genotypes were recommended for further evaluation and demonstration for the study area (Guba district) and similar agro-ecologies.

Keywords: agronomic, improvement, mung bean, phenology

Introduction

Mung bean [*Vigna radiata* (L.) Wilczek] also known as green gram, or locally as choroko, is a self-pollinated diploid ($2n=22$) crop belonging to the family Fabaceae. It originated in India or in the Indo-Burmese region, where it has been cultivated for millennia as indicated by fossilized remains discovered in India dated 1500–1000 BC [1]. In Ethiopia, legume crops are the second most important next to cereals in area coverage and production [2]. Mung bean, a warm season legume crop, is grown mainly for its edible seeds [2]. In Ethiopia, farmers in some moisture stress areas of Southern Ethiopia, Amhara, Tigray and in some parts of Oromia have been producing mung bean to supplement their protein needs and also to harvest reasonable yield during cropping seasons of insufficient rainfall [2].

In Ethiopia, mung bean covers about 41,633.20 ha of land and produces 514,227.41 quintals in main cropping season per annum with average productivity of 1.235 ton per hectare [3].

Mung bean is a widely grown cash crop in the low land areas of North Shewa. However its productivity was very low due to lack of improved seed and high pest and disease infestation problem [4].

However, the productivity of lowland pulses is low due mainly to biotic and abiotic stresses. The main abiotic factors limiting the production of lowland pulses include moisture stress, low soil fertility especially N and P, and soil acidity. The major biotic factors are diseases and insect pests. The type and severity of these constraints depends on the agro-ecology of the growing areas.

The unpredictable rainfall, prevalence of pests and diseases, lack of input supply and development, and lack of proper storage and handling were among the identified production challenges [5]. On the other hand, it is identified that low level of local consumption, inappropriate market chain, lack of market information, price impulsiveness, lack of stakeholder's commitment, limited market promotion and lack of finance were major marketing problems for Mung bean products [5].

Even the productivity of mung bean in Uganda is still low, estimated at less than 300 kg/ha due to a number of constraints such as low yielding varieties, disease and insect pest problems, variable climatic and soil conditions, lack of access to improved varieties, long maturing varieties and poor crop management practices [1].

Where as in Pakistan, pests and diseases are a major constraint while low market demand is particularly a problem for farmers in Uzbekistan [6].

In the other way, low seed quality, low farmer awareness of the effect of mung bean on soil fertility, and high labor costs are identified as common constraints [6].

The traditional mung bean varieties/landraces under cultivation in Uganda are inferior. They are late maturing, require a long harvesting period, low yielding, prone to shattering, are small seeded and susceptible to several diseases [1].

Mung bean is an important pulse crop rich in protein (about 24%) and iron (6 mg/100 g dry seeds) and its cultivation improves soil fertility by adding about 30-40 kg N/ha after the harvest of the crop. Therefore, the succeeding crop (normally

a cereal) requires about 25% less nitrogen application. Mung bean is also considered a hardy pulse crop and grows well in hot and dry climates. Its plant residues are fed to livestock, but can also be used as green manure or as a cover crop to improve soil fertility [1].

For human consumption, mung bean grains are consumed in a number of ways e.g. whole seeds may be boiled, fried alone or with meat/vegetables and eaten as a relish with thick maize porridge ('ugali'). The grains may also be split (dhal) by removing the seed coat by grinding and the split seeds may be eaten boiled, fried, salted and eaten as a snack [1].

Mung bean is an eco-friendly food grain leguminous crop of dryland agriculture with rich source of proteins, vitamins, and minerals [7].

Mung bean in Uganda can be grown either as a single crop (mono-cropping) or as an intercrop (mixed cropping) with other crops by small scale farmers. The most common intercrops involve mung bean with sorghum, maize, pearl millet, cassava and sometimes finger millet. It can also be intercropped with other legumes such as cowpea, pigeon pea and common beans. When it is to be grown in rotation, it should be followed by a cereal crop such as sorghum, maize, pearl millet, finger millet and rice [1].

Metekel zone is potential for the production of lowland pulses like common bean, mungbean,soybean, pigeon pea, and cowpea. So far, at national level, five mung bean varieties have been officially registered / released since 2008 either for feed or food. However, the production of grain mung bean in the current agroecological area is limited, due to shortage of widely adapting improved mung bean varieties, both biotic and abiotic factors, and limited scale up and/or popularization of mung bean varieties. Therefore, the performance evaluation of eight mung bean genotypes with standard check, Shoa robit, particularly for the study area (Guba district) is initiated with the objective:

- To test the performance of mung bean genotypes under rainfall condition
- To evaluate the adaptability of mung bean genotypes for grain yield and other agronomic and/or phenology characters

Materials and Methods

Field experiment

The field experiment was conducted at Guba research station located at metekel zone, Ethiopia from 2014-2017 cropping seasons. The cropping history indicated, the field was sown maize a year ago.

Description of study site

Mean maximum and minimum temperatures were 34.0 °C and 20.8°C, respectively. It receives a maximum of 550 mm rainfall per annum. The dominant soil types were sandy loam soil. Guba sub-station was the permanent experimental station of Pawe Agricultural Research Center. It lies between 35° 21.045' East longitudes and 11° 16.284' North latitudes. The area is characterized by mixed farming i.e. crop cultivation and animal husbandry.

Measured parameters

The agronomic characters evaluated under this study were:

Days to emergence – number of day after planting when 50% of plants emerged

Days to flowering – number of days after planting when 50% of plants in the plot give the first flower. However, when planting in the dry soil in the case of late on-set of rain, it is counted from the first days to soil wetting sufficient for germination

Plant height – the average height of five random sampled plants in each plot measured in centimeter from the ground surface to the top of the main stem at maturity (sum of five randomly selected plants divided by five)

Number of pods per plant – average number of pod of five random sampled plants in each plot (total number of pods of five randomly selected plants divided by five)

Number of seeds per pod – average number of seeds of five random sampled plants in each plot divided by the average number of pods of those five randomly selected plant

Days to maturity – Number of days from date of planting to the date on which 95% of the pods on the plot reached physiological maturity

Grain yield – grain yield (in gram) from the harvestable plot area. It was adjusted to 12.5% moisture level to give adjusted yield

Seed moisture content – determined as percent water content of the seed. It is measured either by oven drying sample seeds or with the help of moisture tester

Thousand seed weight (g) – weight in gram of random sample of 1000 seeds of each plot

Disease data recording – in disease data scoring, use 1-9 scale for severity of foliar diseases such as chocolate spot, rust ascochyta blight, powdery mildew, etc. Scale of 1 = nil (no visible disease symptom = immune); 3 = slight (some small discrete and a few large lesions = resistant); 5 = medium (some coalesced lesions, many spotting and some defoliation = moderately resistant); 7 = severe (large coalesced lesions with about 50% defoliation, few dead stems per plant = susceptible); and 9 = very sever (extensive lesions, sever defoliation, stem girdling, many dead plants = highly susceptible)

Experimental design

The treatments laid out in Randomized Complete Block Design (RCBD) with three replications. The plot size was 4.0m × 2.4m which was equal to 9.6m² with 0.05m intra-row spacing with six row of 0.40m inter-row spacing. The Net plot size was 4.0m × 1.6m which is equivalent to 6.4m² whereas distance between the blocks was 1.50m and the distance between independent plots was 0.5m. Therefore; the total experimental area was 15.0m × 25.6m which was 384.0m². Planting materials was conducted on July 31/2013, August 08/2014, and August 05/2015 respectively. The sample plants were taken randomly from each plot per block and data recorded timely and properly.

The genetic materials applied for this study was presented by (Table 1.).

Table 1: Experimental materials used for the study

No.	Materials	Source	Type	Merit
1	MB 6148-05-12	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
2	Mong hole	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
3	Black Bean	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
4	Asha	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
5	MH 85-1	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
6	MBBR-1	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
7	MB6173-B-33	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Genotype	Bush type
8	Shoa robit	Melkassa Agricultural Research Center,EIAR,Ethiopia (MARC)	Standard check	Bush type
9	MH-97-6	Awassa Agricultural Research Center,SARI,Ethiopia (AARC)	Genotype	Bush type

Statistical analysis

Analysis of variance (ANOVA) was carried out using SAS® 9.3 versions and XLSTAT 2014. F-test was used to test the significance differences between the genotypes, and least significance difference (LSD) for comparing the genotypic means at $P \leq 0.05$. The mung bean genotypes correlation was analyzed to determine the association of the traits that has been studied. The analysis was fitted in the mathematical model as presented below:

Equation 1: Mathematical model of analysis

$$Y_{ij} = \mu + B_i + T_j + e_{ij} \dots\dots\dots (1)$$

Note:

Y_{ij} = response corresponding to JTH replication/block of the ITH treatment
 μ = general effect

B_i = block effect

T_j = treatment effect

e_{ij} = errors associated with JTH replication/block of ITH treatment

Result

There is significant difference among the tested mung bean genotypes at ($p < 0.05$) level of significance (Table 2.). For this particular study eight (8) traits were used for analysis, namely, six agronomic and two phenology characters (i.e. stand count at harvest, ph=plant height (cm), df=days to flower, dm=days to maturity, pods -1 plant=pods per plant, seeds -1 pod=seeds per pod, hsw=hundred seed weight (g), and yield=yield (kg/ha) adjusted at 12.5 % moisture content). Disease score (1-9 scale) for major diseases was taken and subjected for analysis. See attached file with this manuscript (Supplementary material).

Table 2: Performance of mung bean genotypes for agronomic and phenology characters (2013/2014)

Entry	Sch	Ph	Df	Dm	Pods -1 plant	Seeds -1 pod	Hsw	Yield
MB 6148-05-12	312.00	54.40	38.33	69.67	12.60	10.60	5.27	847.8c
Mong hole	297.33	61.93	37.33	71.33	14.07	11.93	4.40	800.5c
Black Bean	301.67	54.80	39.33	66.00	26.27	8.93	5.53	1434.4a
Asha	269.00	43.27	36.67	70.33	8.80	9.53	4.20	1011.3bc
MH 85-1	282.33	47.60	36.33	69.67	12.67	10.53	4.67	975.8bc
MBBR-1	299.67	47.27	34.67	69.67	10.67	9.33	5.07	846.1c
MB6173-B-33	297.00	51.73	39.00	71.00	11.53	11.40	5.80	1062.7bc
Shoa robit	309.67	52.13	36.00	72.00	13.53	12.47	4.53	1440.3a
MH-97-6	289.33	49.07	39.00	70.00	13.73	10.73	4.33	1275.5ab
Mean	295.33	51.36	37.41	69.96	13.76	10.61	4.87	1077.15
CV	4.91	12.04	5.75	2.94	26.31	14.70	19.48	17.05
LSD ($\alpha=0.05$)	25.11	10.70	3.73	3.56	6.27	2.70	1.64	318.00

Note: Means with the same letter in each column are not significantly different at $p < 0.05$ level.
 CV=Coefficient of Variation, LSD= Least Significant Difference, sch= stand count at harvest, ph=plant height (cm), df=days to flower,

dm=days to maturity, pods -1 plant=pods per plant, seeds -1 pod=seeds per pod, hsw=hundred seed weight (g), and yield=yield (kg/ha) adjusted at 12.5 % moisture content.

Table 3: Performance of mung bean genotypes for agronomic and phenology characters (2014/2015)

Entry	Sch	Ph	Df	Dm	Pods -1 plant	Seeds -1 pod	Hsw	Yield
MB 6148-05-12	242.67	56.60	47.00	60.67	12.53	11.03	6.47	1295.27
Mong hole	260.33	72.07	46.00	62.33	9.47	13.41	4.33	1271.68
Black Bean	231.00	65.60	49.33	68.33	38.93	4.61	5.93	1389.64
Asha	219.33	63.33	46.67	60.33	15.80	9.20	4.13	1306.77
MH 85-1	240.33	70.00	46.67	61.33	13.47	10.20	3.40	1326.68
MBBR-1	234.67	68.87	47.00	60.00	12.20	8.97	4.67	1255.43
MB6173-B-33	244.67	61.60	47.00	59.67	9.93	10.87	5.20	1331.26
Shoa robit	280.00	63.93	47.67	60.67	11.40	9.50	3.60	1262.41

MH-97-6	271.33	66.33	48.67	63.00	14.73	11.67	4.00	1285.89
Mean	247.15	65.37	47.33	61.81	15.39	9.94	4.64	1302.78
CV	12.93	14.06	2.35	1.72	23.94	17.70	24.57	8.93
LSD (a=0.05)	55.32	15.91	1.92	1.84	6.38	3.04	1.97	NS

CV=Coefficient of Variation, LSD= Least Significant Difference, sch= stand count at harvest, ph=plant height (cm), df=days to flower, dm=days to maturity, pods -1 plant=pods

per plant, seeds -1 pod=seeds per pod, hsw=hundred seed weight (g), and yield=yield (kg/ha) adjusted at 12.5 % moisture content.

Table 4: Performance of mung bean genotypes for agronomic and phenology characters (2015/2016)

Entry	Sch	Ph	Df	Dm	Pods -1 plant	Seeds -1 pod	Hsw	Yield
MB 6148-05-12	250.67	63.13	39.00	63.33	12.73	11.18	3.87	1299.96abc
Mong hole	241.67	66.47	41.00	66.00	13.47	11.05	3.67	1373.79ab
Black Bean	229.33	68.47	41.33	71.00	16.40	7.29	4.80	1424.69a
Asha	221.33	62.27	41.00	65.67	12.00	8.68	3.73	1119.19c
MH 85-1	237.67	64.87	38.00	62.00	19.67	8.15	3.27	1197.25bc
MBBR-1	239.33	59.87	39.00	64.00	10.73	8.23	3.93	1122.85c
MB6173-B-33	244.00	57.33	38.33	64.00	11.20	9.99	3.87	1389.97ab
Shoa robit	243.00	65.13	41.00	65.33	11.80	11.67	3.93	1474.03a
MH-97-6	243.33	58.87	39.00	64.00	15.53	9.47	4.20	1406.56a
Mean	238.93	62.93	39.74	65.04	13.73	9.52	3.92	1312.03
CV	10.61	7.59	2.38	1.18	21.64	15.71	18.69	9.06
LSD (a=0.05)	43.87	8.27	1.64	1.33	5.14	2.59	1.27	205.84

Note: Means with the same letter in each column are not significantly different at p<0.05 level.

CV=Coefficient of Variation, LSD= Least Significant Difference, sch= stand count at harvest, ph=plant height (cm),

df =days to flower, dm=days to maturity, pods -1 plant=pods per plant, seeds -1 pod=seeds per pod, hsw=hundred seed weight (g), and yield=yield (kg/ha) adjusted at 12.5 % moisture content.

Table 5: Over year performance of mung bean genotypes for agronomic and phenology characters (2013-2015)

Entry	Sch	Ph	Df	Dm	Pods ⁻¹ plant	Seeds ⁻¹ pod	Hsw	Yield
MB 6148-05-12	268.44	58.04bc	41.44bc	64.56bc	12.62b	10.94ab	5.20a	1147.67cd
Mong hole	266.44	66.82a	41.44bc	66.56ab	12.33b	12.13a	4.13bc	1148.65cd
Black Bean	254.00	62.96ab	43.33a	68.44a	27.20a	6.94e	5.42a	1416.26a
Asha	236.56	56.29c	41.44bc	65.44bc	12.20b	9.14cd	4.02c	1145.74cd
MH 85-1	253.44	60.82abc	40.33c	64.33c	15.27b	9.63bcd	3.78c	1166.59bcd
MBBR-1	257.89	58.67bc	40.22c	64.56bc	11.20b	8.84d	4.56abc	1074.78d
MB6173-B-33	261.89	56.89bc	41.44bc	64.89bc	10.89b	10.75ab	4.96ab	1261.3ab
Shoa robit	277.56	60.40abc	41.56bc	66.00bc	12.24b	11.21a	4.02c	1392.24a
MH-97-6	268.00	58.09bc	42.22ab	65.67bc	14.67b	10.63abc	4.18bc	1322.66ab
Mean	260.47	59.89	41.49	65.60	14.29	10.02	4.47	1230.65
CV	9.60	11.66	4.05	3.57	33.19	16.79	20.90	13.81
LSD (a=0.05)	NS	6.56	1.58	2.21	4.46	1.58	0.87	159.96

Note: Means with the same letter in each column are not significantly different at p<0.05 level.

CV=Coefficient of Variation, LSD= Least Significant Difference, sch= stand count at harvest, ph=plant height (cm),

df=days to flower, dm=days to maturity, pods -1 plant=pods per plant, seeds -1 pod=seeds per pod, hsw=hundred seed weight (g), and yield=yield (kg/ha) adjusted at 12.5 % moisture content.

Table 6: Mean separation values for phenology and agronomic traits of mungbean genotypes from (2013-2015)

Trt	Df	Dm	Pods	Seeds	HSW	Yield
3	43.33333 a	68.44444 a	27.20000 a	6.944683 e	5.422222 a	1416.257 a
9	42.22222 ab	65.66667 bc	14.66667 b	10.627495 abc	4.177778 bc	1322.661 ab
8	41.55556 bc	66.00000 bc	12.24444 b	11.213574 a	4.022222 c	1392.241 a
1	41.44444 bc	64.55556 bc	12.62222 b	10.936580 ab	5.200000 a	1147.667 cd
2	41.44444 bc	66.55556 ab	12.33333 b	12.131259 a	4.133333 bc	1148.654 cd
4	41.44444 bc	65.44444 bc	12.20000 b	9.139450 cd	4.022222 c	1145.740 cd
7	41.44444 bc	64.88889 bc	10.88889 b	10.753064 ab	4.955556 ab	1261.300 abc
5	40.33333 c	64.33333 c	15.26667 b	9.627503 bcd	3.777778 c	1166.590 bcd
6	40.22222 c	64.55556 bc	11.20000 b	8.841689 d	4.555556 abc	1074.782 d

Mean	41.49383	65.60494	14.29136	10.02392	4.474074	1230.655
CV	4.047073	3.577991	33.19965	16.79254	20.90505	13.81785
LSD(0.05)	1.579659	2.208079	4.463194	1.583407	0.8798185	159.9614

Table 7: Analysis of Variance Table for yield

Response: Yield					
	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Trt	8	1072662	134083	4.6369	0.0001496 ***
Rep	2	56882	28441	0.9835	0.3792407
Year	2	955473	477737	16.5211	1.42e-06 ***
Residuals	68	1966337	28917		

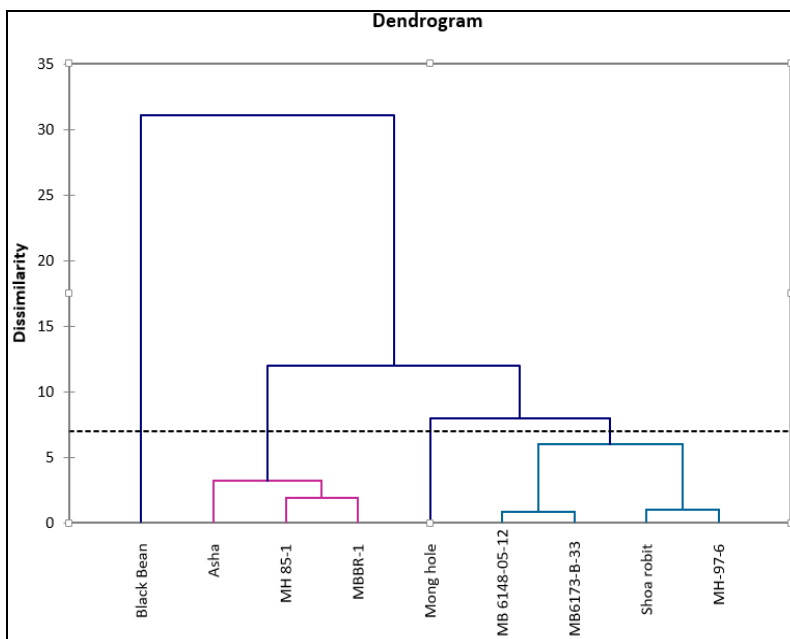


Fig 1: Genetic similarity matrix among mung bean genotypes revealed by Agglomerative Hierarchical Clustering (AHC) with XLSAT

Table 8: Proximity matrix (Euclidean distance)

	MB 6148-05-12	Mong hole	Black Bean	Asha	MH 85-1	MBBR-1	MB6173-B-33	Shoa robit	MH-97-6
MB 6148-05-12	0	3.645	6.404	3.660	3.055	2.114	1.317	3.234	2.514
Mong hole	3.645	0	6.440	4.566	3.319	3.831	3.798	3.026	3.271
Black Bean	6.404	6.440	0	6.362	6.474	6.596	6.067	6.108	5.517
Asha	3.660	4.566	6.362	0	2.366	2.420	3.066	4.424	3.297
MH 85-1	3.055	3.319	6.474	2.366	0	1.956	2.906	3.345	2.586
MBBR-1	2.114	3.831	6.596	2.420	1.956	0	2.303	3.832	2.974
MB6173-B-33	1.317	3.798	6.067	3.066	2.906	2.303	0	2.733	1.848
Shoa robit	3.234	3.026	6.108	4.424	3.345	3.832	2.733	0	1.442
MH-97-6	2.514	3.271	5.517	3.297	2.586	2.974	1.848	1.442	0

The standard check, Shoa robit, is very far from Black Bean (6.108) revealed that the difference between the candidate mung bean genotype Black Bean and Shoa robit is large.

However, the difference between MH-97-6 and Shoa robit is small (1.442) when compared with other entries (Table 6.).

Table 9: Correlation coefficient of quantitative traits

Variables	sch	ph	df	dm	pods ⁻¹ plant	seeds ⁻¹ pod	hsw	yield
sch	1							
ph	0.255	1						
df	-0.099	0.299	1					
dm	0.007	0.584	0.895	1				
pods ⁻¹ plant	-0.198	0.370	0.909	0.772	1			

seeds ⁻¹ pod	0.628	0.121	-0.584	-0.360	-0.715	1		
hsw	0.069	-0.070	0.580	0.315	0.457	-0.378	1	
yield	0.349	0.128	0.722	0.664	0.586	-0.175	0.222	1

Correlation among quantitative traits was mostly positive ;based on the findings grain yield was positively correlated with stand count at harvest (0.349), plant height (0.128), days to flower (0.265957), pods per plant (0.586), and hundred seed weight (0.222) except seeds per pod ^[7] (Table 7.).

Discussion

The analysis result (Pvalue < 0.05 level) revealed; the highest grain yield obtained from Black Bean (1416.26 kg/ha) while the lowest grain yield was scored by MBBR-1 (1074.78 kg/ha) (Table 5.). Similar result was reported by ^[7]. Yield contributing trait, pods per plant, Black Bean (27.20) scored the highest whereas MB6173-B-33 scored the lowest (10.89) (Table 5.). This implied genotype Black Bean was high grain yielder among the tested mung bean genotypes for this study. Mong hole scored the highest seeds per pod (12.13 seeds per pod) while Black Bean obtained the lowest seeds per pod (6.94 seeds per pod) (Table 5.). Minimum hundred seeds weight is obtained from MH 85 – 1 (3.78 g) however, Black Bean scored the highest hundred seeds weight (5.42 g) (Table 5.). Except genotype Black Bean, other mung bean genotypes were non-significant difference for days to flowering and days to maturity (Table 5.) Similar study result was reported by ^[8]. Maximum plant height scored by Mong hole followed by Black Bean, MH 85-1, and Shoa robit with mean value of 66.82, 62.96, 60.82, and 60.40 cm respectively (Table 5.). This result implied the tested mung bean genotypes were good option for mechanical harvesting there by avoiding or minimizing yield loss during harvesting and threshing process. This is because mung bean naturally has the habit of shattering. There is no significant difference of stand count at harvest among the tested mung bean genotypes; that revealed the genotypes perform well from emergence to harvesting stage (Table 5.). The study result revealed; there was variability among mung bean genotypes, with traits of interest, tested at Guba, North-West, Ethiopia (Table 5.). The grain yield gained from 2013 cropping season (1077.15 kg/ha) lower than other cropping seasons (Figure 2.). However; both cropping seasons 2014 and 2015 scored more or less similar average yield 1302.78 and 1312.03 kg/ha respectively) (Figure 2.).

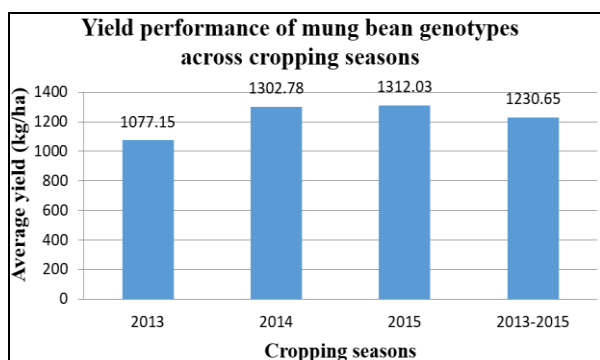


Fig 2: Average yield across cropping seasons

Conclusion

Agriculture is the backbone of Ethiopia's economy and the livelihoods of the most vulnerable populations. Increased growth is essential to realize the interconnected goals of food security, poverty reduction, and human and economic development. Based on the performance, at field condition, variation occurred among the tested mung bean genotypes. Grain yield of mung bean genotypes ranged from 1074.78 kg/ha (MBBR-1) to 1416.26 kg/ha (Black Bean), while the standard check Shoa robit, gave 1392.24 kg/ha. A 2.0% yield advantage over the standard check is substantially feasible indicator of the test values for the mung bean genotypes. Cultivar types are important for good agronomic performance for greater growth and total dry biomass ^[9].

Therefore, the performance evaluation of mung bean genotypes were recommended for further evaluation and demonstration for the study area (Guba district) and similar agro-ecologies.

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