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Research Article

Evaluation of Soya Bean Varieties at Moisture Stress of Eastern Harerghe Zone

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Abstract

Soya bean is a multi-purpose crop. The area of production for soybeans is expected to increase due raised demand of domestic processing industries and boosted demand for use in animal feed. This experiment were conducted with the objective of identify superior genotypes in terms of yield, insect pest & disease tolerance/resistance and with desirable agronomic traits for the last two years of (2014 & 2015). Analysis of variance showed that there were significant difference among the varieties in terms of disease reaction, grain yield and yield related attributes. Korme, Ethio-eugoslavia and Didesa provided about 32.67%, 29.11%, 22.55%, yield advantages over the standard check (Clark), respectively. Therefore, the three high yielding varieties (Korme, Ethio-eugoslavia, and Didesa) were selected and recommended for further production at Fedis and similar agro-ecologies.

Keywords: Variety; Adaptability; Yield advantages

Introduction

Soybean (Glycine max) is one of the most valuable crops in the world, due to its multiple uses as a source of livestock and aquaculture feed, protein and oil for the human diet and biofuel besides producing valuable grain, soybean fixes between 44 and 300kgNha^{-1} which makes a significant N contribution to intercropped and rotated cereal crops. For example, Peoples and Craswell 1992 estimated the improvement of maize crop following soybean crop at between 0.5 and 3.5tons ha^{-1} or 30-350% relative to maize-maize sequences.

The yields of soybean in most parts of Africa can increase from 0.5 to 2.5tons ha-1 if the recommended steps are followed during their production. In most cases when soybean yields exceed 1.2ton ha^{-1}, farmers are likely to make profits but at less than 0.7tons/ha farmers may not be able to recoup the cost of production. As soybean market value is good, application of little fertilizer like 20kgPha-1, starter nitrogen and inoculant is often profitable even with conservative yield increment of 0.5tons ha^{-1}. Important measures for boosting soybean yields include; adoption of high yielding seed varieties, soil fertility management, pest/disease control, observing the most appropriate planting time. This section reviews existing knowledge on some of the best management practices for soybean.

Soya bean is a multi-purpose crop. The area of production for soybeans is expected to increase due raised demand of domestic processing industries and boosted demand for use in animal feed. Ethiopia is strategically located closer to the world's largest consumers EIAR 2011. The reasons for low productivity of this crop are due to various reasons but the major reason is lack of high yielding improved varieties. To improve such low productivity, specially; in eastern Harerghe adaptation of high yielding varieties with proper plant architecture and duration was effectively done and it has paramount importance. For this purpose, the seven varieties with suitable plant types were selected from Bako Agricultural Research Center and adapted. This experiment was conducted with the objective of identify superior genotypes in terms of yield, insect pest & disease tolerance/resistance and with desirable agronomic traits for the last two years 2014 & 2015.

Materials and Methods

The study was conducted at mid-altitude of Eastern Harerghe Fadis on station. Six improved soybean varieties (dhidhessa, ketta, korme, ethio-ugislavia, hawasa04 and awasa95) were collected from Bako Agricultural Research Center. Standard check (clark) were used to compare with those improved varieties. Recommended spacing was used with plot size of 3mx4m. Seed rate of 134kg/ha were used for each variety depending on the seed size [1-14].

Results and Discussion

With the objective of evaluating the performance ability/adaptability/ of the soybean varieties in terms of yield, and yield related traits, the trial was undertaken on 3m*4m for last two years on one location (Fadis). So far, data on disease and insect pest incidence, days to maturity, number of pods per plant, seed of seeds per pod, number of seeds per plant were taken. All data were

collected and analyzed by using the Gen STAT software. Analysis of ANOVA showed that there were significant difference among the varieties in terms of disease reaction, grain yield and yield related attributes. The table ANOVA shows the pooled mean yield of soybean varieties at one location and years 2014 & 2015 in adaptation trial was significant (5%) difference. It was clearly indicated that korme, ethio-eugoslavia and Didesa were superior to the standard check and selected for further production and promotion program. Awasa 04 was very sensitive to diseases reaction (Table 1).

Table 1.

Mean				
Treatment Name	**MD**	**Ppp**	**Spp**	**Yield(kg/ha)**
Korme	136a	111a	2.5	2745a
Keta	136a	82abc	2.467	2103bc
Didesa	136a	87abc	2.433	2563ab
Ethio-eugolavia	132a	91abc	2.6	2681a
hawasa04	122ab	87abc	2.5	1801c
awasa95	108b	105ab	2.5	1918c
Clark(st.ck)	122ab	73c	2.5	1798c
CV%	9.2	25.1	11.5	19.3
LSD	13.74	26.68	0.34	509.8
PV (5%)	*	*	NS	*

Note: NB: MD: Maturity Date; Ppp: Pod per Plant; Spp: Seeds per Pod; Yield (kg/ha): grain yield in kilogram per hectare; NS: Not Significant

Recommendation

The analysis of variance showed that significant differences for grain yield among evaluated varieties. Korme, Ethio-eugoslavia and Didesa provided about 32.67%, 29.11%, 22.55%, yield advantages over the standard check (Clark), respectively. Therefore, the three high yielding varieties (Korme, Ethio-eugoslavia, and Didesa) were selected and recommended for further production at Fedis and similar agro-ecologies.

References

1. Agarwal AP, Patil SA, Salimath PM (2000) Identification of potential soybean genotypes for pod shattering resistance and seed yield. Crop Improvement 27: 236-239.
2. Allard RW (1960) Principles of Plant Breeding. John Wiley and Sons Inc. New York, USA.
3. Ansari BA, Ansari KA, Khund A (2004) Extent of Heterosis and heritability in some quantitative characters of bread wheat. Indus J Plant Sci 3: 189-192.
4. Aravind GRR, Hanchinal (2006) Genetic variability and diversity studies in soybean. In: Bangar ND, Mukhekar GR, Lad DB, Mukhekar DG (Eds.), Genetic variability, correlation and regression studies in soybean. J Maharashtra Agric Univ 28: 320-321.
5. Basavaraja GT (2002) Studies on induced mutagenesis in soybean Ph. D. Thesis, University of Agricultural Sciences, Dharwad, India.
6. Burton CW, Devane EH (1953) Estimating heritability in tall Festuca (*Restuca arundinaceae*) from donar material. Agron J 45: 1476-1481.
7. Cochran WG, M Cox (1957) Experimental designs. John Wiley and Sons, Inc, New York, USA, p. 611.
8. CSA (Central Statistics Agency) (2012) Crop production forecast sample survey. Report on area and crop production forecast for major crops (For Private Peasant Holding, Meher Season). Statistical Bull, p. 568.
9. Fisher RA (1918) The correlation between relatives on the supposition of Mendelian inheritance. Trans Royal Society, Edinburgh 52: 399-443.
10. Gopalan C, Ramashastry BV, Balasubramanian SC (1994) Nutritive value of Indian foods. Indian Council of Medical Research, India, pp. 24-26.
11. Hayman BD, Mather (1955) The description of genetic interaction in continuous variation. Biometrics 11: 68-82.
12. Hinaausar J (2005) Genetic investigations in segregating populations of soybean. In: Johansson WL (Ed.), University of Agricultural Sciences, Dharwad, USA.
13. Johnson HW, Robinson HF, Comstock RE (1955) Estimates of genetic and environmental variability in soybeans. Agronomy Journal 47: 314-318.
14. Karad SR, Harer PN, Kadam DB, Shinde RB (2005) Genotypic and phenotypic variability in soybean.