PERFORMANCE OF DIFFERENT HYBRIDS OF OKRA FOR IMPROVED TRAITS UNDER AGRO-ECOLOGICAL CONDITION OF PESHAWAR

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Abstract

An experiment “Performance of different cultivars (hybrids) of Okra in Peshawar Tarnab” was conducted at “Agricultural Research Institute Tarnab, Peshawar” during Summer Season 2012. The experiment was carried out in randomized complete block design having three replications. The experiment consisted of five hybrids of Okra i.e., Arba Anamibia, Makhmali, Shagun, Nazia F1 and Pusa Sawami. The seeds of different cultivars were sown in field during first week of May, 2008. Normal cultural practices like hoeing, irrigation and weeding was done regularly and uniformly to all the treatments of the experiments. Data were recorded on plant height, leaf length, leaf width, stem thickness, petiole length, fruit length and fruit diameter. Different hybrids significantly affected plant height, leaf length, leaf width stem thickness, petiole length, fruit length and fruit diameter of Okra. Maximum plant height was recorded by hybrid Nazia F1 (58.56 cm) whereas Shagun showed minimum (42.60 cm) plant height. Maximum leaf length was observed in cultivator Makhmali (15.73 cm) whereas Arba Anamibia resulted in minimum (14.46) leaf length. Hybrid Arba Anamibia showed maximum leaf width (12.93 cm) while Pusa Swami resulted minimum leaf width (10.63 cm). Maximum stem thickness was recorded by hybrid Nazia F1 (1.62) while minimum stem thickness was observed in Arba Anamibia (1.40 cm). Both Arba Anamibia and Makhmali (17.13 cm) resulted in maximum petiole length, while minimum petiole length (14.13 cm) was recorded by Pusa Sawami. It is concluded that hybrid Makhmali performed better in fruit diameter, fruit length, leaf length and leaf width than the other hybrids tested and hence recommended in the agro ecological condition of Peshawar valley.

Key words: Okra, hybrids, irrigation, weeding and hoeing

INTRODUCTION

Okra (Abelmoschus esculentus L. Moench) belongs to the family Malvaceae. Okra originated in tropical Africa, was grown in the Mediterranean region and in wild forms is also found in India (This et al., 1998). According to Adeniyi (2001) that three agro-economic indicators, increased yield, net returns and benefit-cost ratio, employed in determining the suitability of intercropping with tomato and okra in a series of experiments conducted during the 1997 and 98 cropping seasons showed that the most profitable practice is the sole cropping of tomato at a population density of 37,000 plants per hectare. Simonne et al. (2002) eventuated that seed priming is a physiological seed treatments which brings about quantitative improvement in the seed which persist even after the treatment is removed. A study was

conducted to compare different seed priming methods and optimized the best methodology of seed priming for okra and beetroot. Four methods of priming viz., hydropriming, sand matricpriming, halopriming and osmopriming were evaluated by screening a range of durations and concentrations (Hussain et al., 2006).

Duzyaman (2003) conducted experiment on ten traditional, Turkish okra cultivars (Batl Trakya, Akkoy 41, Kabakli II, Denizli, Denizli uzun, Bornova (TR-57377 and TR-57420), Amasya Cicek, Ballkesir T-1, Aghasun/Burdur) and one commercial cultivar (Sultani/May Seed Company) were selected to represent the variability within domestic okra Germplasm from the Anatolian Plateau. Replicated field trials were conducted to evaluate a total of 21 morphological, horticultural and physiological characteristics. All 21 characters were statistically significant among the cultivars and had at least one high coefficient in at least one of the first six PC axes, which demonstrated that all of them served as distinguishing characters among the cultivars. By using the un-weight pair-group method with arithmetic average four main clusters were consistently formed across all years. Adeniji and Kehinde (2007) introduced pure lines and hybrids with improved length and width into the cropping system, necessitate studies on the combining ability and genetic components for the length and width of pods. Seven parents and 21 F generations were planted for evaluation in a randomized complete block design with two replications. The results indicated that the means squares due to GCA and SCA for length and width of pods were significant. The estimated variance due to SCA was greater than GCA variance for length and width of pods at edible stage and vice versa for length and width of pod at maturity. Nirmala and Umarani (2008) reported that several okra cultivars are now available as alternative to the standards ‘Clemson Spineless’ (open pollinated) and ‘Annie Oakley II’ (hybrid). Based on the results of four trials involving 20 cultivars, ‘Mita’, ‘Spkie’, ‘Green Best’ and ‘North & South’ should be added to the list of recommended cultivars for Alabama and Florida.

MATERIALS AND METHODS

An experiment on “Performance of different cultivars (hybrids) of Okra” was conducted at Agricultural Research Institute Tarnab, Peshawar during Summer Season 2012. The experiment was carried out in randomized complete block design having three replications. The experiment was consisted of five hybrids of okra i.e. Arba Anamibi, Makhmali, Shagun, Nazia F1 and Pusasawami. The trial was laid out with the objective to find out adaptability performances of different Okra cultivars under the prevailing local agro-climatic conditions. The seeds of different cultivars were sown in field during first week of May. Normal cultural practices like hoeing, irrigation and weeding were followed regularly and uniformly to all the treatments of the experiments.

Procedure for data recording: The data were recorded on plant height, leaf length, leaf width, stem thickness, petiole length, fruit length and fruit diameter. Height of ten plants from base of the plant to the tip of plant of each hybrid was measured with the help of meter rod and the average was calculated. The leaf length of ten plants for each hybrid was measured with the help of meter rod and then average was calculated. Leaf weight data were recorded by measuring the width of ten plant leaves in each treatment with the help of meter rod and then average was calculated. Data regarding stem thickness was noted by measuring stem thickness of ten plants in each treatment with the help of vernier caliper and then average was calculated. Petiole length was measured from stem petiole axil to the base of the lamina with the help of meter rod and the average was calculated. Fruit length data were determined by taking ten fruits in each treatment and then measured its length with the help of vernier caliper and then average was calculated. Fruit diameter was also calculated by measuring ten fruits width in each treatment with the help of vernier caliper and then average was calculated.

Statistical analysis: The data analysis after collection was done according to ANOVA technique for randomized complete block using Statistix 8.1 software. The treatment means were compared at
RESULTS AND DISCUSSION

Plant height (cm): The data related to the plant height is shown in Table 1. Statistical analysis of the data showed that different hybrids of okra have significant effect on plant height. Comparing the means of plant height, it was found that maximum plant height (58.56 cm) was recorded by Nazia F1, followed by Arba Anamibia, having 58.20 cm of plant height while minimum plant height (42.60 cm) was recorded in the Shagun cultivar. It might be due to the genetic potential of the hybrid which resulted in long stature plants same are in line with Nirmala and Umarani (2008).

Leaf length (cm): The data related to the leaf length (cm) is given in Table 1. Statistical analysis of the data showed that different Hybrids of Okra has significant effect on leaf length. Comparing the means of leaf length, it was found that maximum leaf length (15.73 cm) was recorded by Makhmali, followed by (15.13) which is recorded from Nazia F1, while minimum leaf length (14.46) was recorded in the Arba Anamibia cultivars. It may also be due to genetic potential of the hybrid that resulted in maximum leaf length, the results match with Duzyaman (2003 & Alam et al. 2008).

Leaf width (cm): The data related to the leaf width is reported in Table 1. Leaf width was significantly varied among various hybrids of Okra. Wider leaf (12.93 cm) was recorded for Arba Anamibia, followed by Shagun (12.46cm) while narrow leaf (10.63 cm) was recorded for Pusa Sawami. It may also be due to the genetic potential of the hybrid that resulted in maximum leaf width, the results are same as that of Duzyaman (2003).

Stem thickness (cm): The data related to the stem thickness is shown in Table 1. Statistical analysis of the data showed that different hybrids of okra have significant effect on stem thickness. Maximum stem thickness (1.62 cm) was recorded by hybrid Nazia F1, followed by Makhmali (1.57 cm) while minimum stem thickness (1.40 cm) was recorded in the Arba Anamibia. It may also be due to the genetic potential of the hybrid that resulted in maximum stem thickness same with Ghannad et al. 2014.

Petiole length (cm): Different hybrids of okra have significant effect on petiole length. Comparing the means of petiole length, it was found that maximum petiole length (17.13 cm) was recorded by Makhmali, followed by Arba Anamibia (16.8 cm) while maximum petiole length (14.13 cm) was recorded in the Pusa Sawami Cultivar (Table 1). It might be due to the genetic potential of the hybrid which resulted in long stature plants as studied by Adeniji and Kehinde (2007).

Fruit length (cm): The data related to the fruit length is presented in Table 1. Statistical analysis of the data showed that different Hybrids of Okra has significant effect on fruit length. Comparing the means of fruit length, it was found that maximum fruit length (17.2 cm) was recorded by Makhmali, followed by (16.43 cm) which is recorded from Nazia F1, while fruit length (15.36 cm) was recorded in the Arba Anamibia. It may also be due to the genetic potential of the hybrid that resulted in maximum fruit length, same result was reported by Adeniji and Kehinde (2007).

Fruit diameter (cm): The data related to the fruit diameter are given in Table 1. Different Hybrids of Okra has significant effect on fruit diameter. Comparing the means of fruit diameter, it was found that maximum fruit diameter (2.13 cm) was recorded by Makhmali, followed by (1.74 cm) which is recorded from Nazia F1, while maximum fruit diameter (1.68 cm) was recorded in the Shagun cultivars. It may be due to the genetic potential of the hybrid that resulted in maximum fruit diameter, same result observed by Adeniji and Kehinde (2007). Similar results are reported by Ali et al. (2012).
Table 1. Plant height (cm), leaf length (cm), leaf width, stem thickness, petiole length, fruit length and fruit diameter as affected by different hybrids of okra

<table>
<thead>
<tr>
<th>Cultivars</th>
<th>Plant height</th>
<th>Leaf length</th>
<th>Leaf width</th>
<th>Stem thickness</th>
<th>Petiole Length</th>
<th>Fruit length</th>
<th>Fruit diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arba Anamibia</td>
<td>58.20 a</td>
<td>14.46 c</td>
<td>12.93 a</td>
<td>1.40 c</td>
<td>16.8 a</td>
<td>15.36 b</td>
<td>1.70 b</td>
</tr>
<tr>
<td>Makhmali</td>
<td>53.63 a</td>
<td>15.73 a</td>
<td>11.5 ab</td>
<td>1.57 ab</td>
<td>17.13 a</td>
<td>17.2 a</td>
<td>2.13 a</td>
</tr>
<tr>
<td>Shagun</td>
<td>42.6 b</td>
<td>14.7 bc</td>
<td>12.46 a</td>
<td>1.51 abc</td>
<td>15.5 ab</td>
<td>16.23 ab</td>
<td>1.68 ab</td>
</tr>
<tr>
<td>Nazia F1</td>
<td>58.56 a</td>
<td>15.1 ab</td>
<td>11.6 ab</td>
<td>1.62 a</td>
<td>16.2 ab</td>
<td>16.43 ab</td>
<td>1.74 ab</td>
</tr>
<tr>
<td>Pusa Sawami</td>
<td>54.13 a</td>
<td>14.7 ab</td>
<td>10.63 b</td>
<td>1.49 bc</td>
<td>14.13 b</td>
<td>15.43 b</td>
<td>1.72 b</td>
</tr>
<tr>
<td>LSD$_{0.05}$</td>
<td>9.08</td>
<td>1.07</td>
<td>1.93</td>
<td>0.15</td>
<td>2.20</td>
<td>1.59</td>
<td>0.22</td>
</tr>
</tbody>
</table>

CONCLUSION

It is concluded from the study that okra hybrid Makhmali had bigger fruit diameter, lengthy fruit and had improved leaf length and leaf width as compared to other hybrids under study and hence recommended for cultivation in the agro-ecological condition of Peshawar valley.

REFERENCES


Duzyaman, E. Phenotypic diversity within a collection of distinct okra (Abelmoschusesculentus) cultivars derived from Turkish land races. Genetic Resources and Crop Evolution., 52 (8): 1019-1030.


