Evaluation of Some Garlic (*Allium sativum* L.) Cultivars Grown Under Mansoura Region Conditions

Anwar, E. A. I. Gouda


**ABSTRACT**

During 2010/2011 and 2011/2012 seasons six garlic entries (five cvs namely Sids–40, Egaseed-1, Chinese, Balady, Balady El-Wady and the clone Egaseed-2) were tested for their growth, bulb characteristics and total yield per feddan under Mansoura, Dakahlia Governorate environmental conditions. Major variations were observed among all garlic entries for all the studied parameters. Sids-40 cultivar gave the maximum bulb weight clove weight and total fresh yield in relative to the other garlic cvs. On the contrary, Balady El-Wady and Balady garlic cvs occupied the last position in this respect. The superiority of different garlic cvs grown under Mansoura conditions according to their production can be arranged as follows in descending order, Sids-40 Egaseed-2, Egaseed-1 Chinese, Balady and Balady El-Wady.

**Key words:** Garlic (*Allium sativum* L.) Cultivars, Evaluation

**Introduction**

Garlic is considered an important vegetables grown under Egyptian conditions for local marketing and exportation.

Many efforts were made for introducing high yielding garlic cultivars to Egypt for overcoming the problem of yield decline. In addition, unbalancing cropping of Balady garlic the dominant garlic cv grown under Egypt conditions encourage garlic workers to search about more new garlic cvs. Nowadays, many new garlic cultivars and clones are greatly appeared in Egypt due to the rare and unknown information about the success of these cvs under different climatic conditions prevailing in Egypt, vegetable workers must carry out extensive trials for evaluating these garlic cvs for ensuring the success of these cvs under different locations of Egypt.


The merit of this study was evaluating the success degree of five garlic cvs Sids-40, Egaseed-1, Chinese, Baldy and Balady El-Wady and the clone Egaseed-2 grown under Mansoura region conditions.

The evaluations were depended on the vigor and production of these garlic cvs under such site.

**Materials And Methods**

This investigation was performed during the two winter seasons of 2010/2011 and 2011/2012. The texture of the tested soil is clay. For achieving of this trial five garlic cvs namely Sids-40, Egaseed-1 Chinese, Baldy and Balady El-Wady and one clone of garlic namely Egaseed-2 were selected. All garlic cvs were planted on the first and second week of October during both seasons, respectively.

Soil analysis was made before the start of the experiment to determine its chemical composition and physical properties. The obtained results were presented in Table (1)

The experimental design was randomized complete block design. Each treatment (garlic cv.) was replicated three times one experimental cv, area per each. The experimental cultivar plot area was 8.4 m². Each plot consisted from 4 ridges, 3 meters length and 0.7 m width. Cloves were handy planted on the basis of 10 cm apart between cloves in both sides of ridges running east to west. Horticultural practices that were common applied in garlic management were followed as usual.
Table 1: Analysis of the tested soil.

<table>
<thead>
<tr>
<th>Constituents</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand %</td>
<td>6.2</td>
</tr>
<tr>
<td>Silt %</td>
<td>22.6</td>
</tr>
<tr>
<td>Clay %</td>
<td>71.2</td>
</tr>
<tr>
<td>Texture</td>
<td>Clay</td>
</tr>
<tr>
<td>EC (1/2.5 extract) ppm</td>
<td>259</td>
</tr>
<tr>
<td>O.M%</td>
<td>1.9</td>
</tr>
<tr>
<td>CaCO$_3$%</td>
<td>1.23</td>
</tr>
<tr>
<td>Total N %</td>
<td>0.10</td>
</tr>
<tr>
<td>Available P% (Olsen, ppm)</td>
<td>3.3</td>
</tr>
<tr>
<td>Available K (ppm, ammonium acetate)</td>
<td>401.3</td>
</tr>
</tbody>
</table>

During both seasons the following parameters were recorded:

1- Percentage of emergence after 25 days from planting was estimated according to the equation which reported by Gritsenko and Katoshina (1976).

2- Vegetative growth characters:

Random sample of three plants were taken after 140 days from planting and the following characters were measured:

- Average plant height (cm) measured from bulb base to top leave blade.
- Average number of leaves per plant.
- Fresh weight of whole plant (g).

**Bulb characteristics and total yield (tons/fed.):**

After harvesting, plants were left to cure before cutting off dry leaves and roots and the following data were measured:

1- Average bulb Weight (g).
2- Average number of cloves per bulb.
3- Average clove weight (g).
4- Total yield (ton/fed.) was calculated by weighting of all the harvested garlic bulbs for each plot and expressed as tons/fed.

All the obtained data were subjected to the proper statistical analysis according to Mead et al, (1993). Means were compared using new L.S.D. at 5%.

**Results And Discussions**

1- **Field emergence percentage:**

It is clear from the data in Table (2) that percentage of emergence was significantly varied among all six garlic entries. Generally, after 25 days from planting, Balady cv followed by Baldy El-Wady showed a tendency towards higher emergence % than other entries during both seasons. Out of all the tested garlic cvs Egaseed-1 recorded the lowest value.

The favorable environmental conditions and its coupled with genetics for Balady and Balady El-Wady garlic cvs could explain the present results.

These results are in harmony with those obtained by Moustafa et al, (2009) and Aly (2010) who supported the great variation of different garlic cvs in their emergence %.

2- **Growth Characters:**

**a- Average plant height:**

It is clear from the obtained data that averages plant height values were depended on garlic cvs. It was significantly maximized in garlic cvs Balady and Balady El-Wady and was minimized in garlic cvs sid-40. These results were true during both seasons.

**b- Average number of leaves per plant:**

The six garlic cvs significantly showed variation in their average number of leaves per plant. The highest values were recorded in garlic cvs Sids-40 followed by Chinease cv. The lowest number of leaves per plant was appeared in garlic cvs Balady and Balady El-Wady. Similar trend was noticed during 2010/2011 and 2011/2012 seasons.
C- Fresh weight of whole plant:

One can state that Egaseed-1 garlic cv ranked first for whole plant weight, followed by Sids-40 and Egaseed-2 while Baldy and Balady El-Wady ranked the last position in this respect these results were true during both seasons.

The previous significant differences on growth characters among various as garlic cvs were confirmed by the results of Shalaby (1973), Hussain et al., (1995); Mohamed (2004); Moustafa et al., (2009) and Aly (2010).

3- Bulb characteristics and total yield.

a- Average bulb weight:

The obtained results (Table 2) showed significant differences among all entries in average bulb weight. The highest bulb weight was recorded in garlic cv Sids-40 followed by Egaseed-2 clone. The minimum bulb weight was obtained in garlic cv Balady El-Wady and Balady cv during both seasons.

Table 2: Percentage of emergence, vegetative growth characters and bulb characteristics and total yield as influenced by different garlic cultivars during 2010/2011 and 2011/2012 seasons

<table>
<thead>
<tr>
<th>Different cultivars of garlic</th>
<th>Field emergence %</th>
<th>Plant height (cm)</th>
<th>No of leaves / plant</th>
<th>Fresh weight of whole plant (g.)</th>
<th>Average bulb weight (g.)</th>
<th>Average number of cloves/bulb</th>
<th>Average clove weight (g.)</th>
<th>Total fresh weight (ton/fed.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sids-40</td>
<td>66.0</td>
<td>65.1</td>
<td>6.9</td>
<td>67.9</td>
<td>90.0</td>
<td>1.1</td>
<td>12.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Egaseed-2 clone</td>
<td>63.3</td>
<td>62.4</td>
<td>9.9</td>
<td>91.9</td>
<td>112.4</td>
<td>2.2</td>
<td>15.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Egaseed-1</td>
<td>60.1</td>
<td>59.2</td>
<td>8.7</td>
<td>89.8</td>
<td>116.1</td>
<td>1.9</td>
<td>12.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Chinease</td>
<td>69.9</td>
<td>68.9</td>
<td>10.8</td>
<td>91.9</td>
<td>127.4</td>
<td>1.1</td>
<td>12.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Balady (El-Masry)</td>
<td>75.0</td>
<td>74.0</td>
<td>8.1</td>
<td>91.9</td>
<td>121.1</td>
<td>1.1</td>
<td>12.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Balady El-Wady</td>
<td>73.0</td>
<td>72.0</td>
<td>8.0</td>
<td>91.0</td>
<td>120.0</td>
<td>1.1</td>
<td>12.9</td>
<td>6.9</td>
</tr>
<tr>
<td>New L.S.D at 5%</td>
<td>1.9</td>
<td>2.0</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>1.1</td>
<td>1.0</td>
<td>0.9</td>
</tr>
</tbody>
</table>

b- Average number of cloves per bulb:

This character was significantly varied by all the entries of garlic. Number of cloves per bulb for the investigated six entries ranged from 9.7 to 25.5 and 10.1 to 26.0 in both seasons, respectively. Number of cloves per bulb was maximized in garlic cv Balady El-Wady followed by Balady garlic cvs. Bulbs of cvs Sids-40 and Egaseed-2 clone contained the lowest number of clovers in both seasons. These results were true during both seasons.

c- Average clove weight:

It is clear from the obtained data that significant differences were observed among the six entries of garlic with respect to average clove weight in both seasons. During both seasons, Sids-40 and Egaseed-2 clone had the highest values of clove weight than the other tested cvs. The lowest values for average clove weight were obtained in the cultivars Balady El-Wady and Balady.

d- Total yield (ton/fed.):

It is evident from the data in Table (2) that there were significant differences among the various investigated entries with regard to yield per feddan. In both seasons, the greatest total yield was recorded in garlic cvs Sids-40 and Egaseed-2 clone. Significant differences on the yield was detected among the two garlic cvs namely Sids-40 and Egaseed-2 clone. The garlic entries that were responsible for obtaining the minimum yield were Balady El-Wady and Balady during both seasons. Total yield/fed was 6.5 and 5.0 tons for garlic cv Sids-40 during both seasons respectively. Balady El-Wady garlic cv produced 2.1 and 2.0 tons in both seasons respectively. These results were true during both seasons.
According to the obtained data one can state that the used six garlic entries differed significantly towards their bulb characteristics and total yield per feddan. The best results were attributed to planting garlic cvs Sids-40 Egaseed-2 clone and Egaseed-1 in ascending order.

On the contrary, both Balady El-Wady and Balady garlic cvs produced the minimum yield and bulb and clove weights but gave bulbs with maximum number of cloves. According to the present study it is recommended to distribute garlic cvs Sids-40, Egaseed-2 clone and Egaseed-1 for their higher own from yield and bulb characters.

These results are in conformity with those obtained by Hassan (2002), Mohamed (2004), Moustafa (2009) and Dawood et al., (2011).

As a conclusion, garlic entries Sids-40, Egaseed-2 clone and Egaseed-1 were recommended for garlic production for high yielding capacity under Mansoura conditions.

References


