Farmer training for eggplant grafting

A discussion meeting was held with 10 farmers including two nurserymen to orient them on eggplant grafting technology before taking up the plans of pilot production of eggplant grafts in Jessore site. Being convinced, the farmers grew eggplant grafts and were highly impressed with the performance of eggplant grafts in respect of high survival of plants and crop establishment, and high yields and increased income. In August, 2002, a one-day farmer training on vegetable IPM practices and eggplant graft preparation was conducted at BARI station, Jessore with 25 farmers including three women farmers and three nurserymen. The impact of the training was reflected in a tremendous response by the farmers in adopting IPM practices and eggplant grafting technology in their fields at Gaidghat of Jessore.

Impacts

Excellent performance of eggplant grafts in respect to minimum plant mortality from bacterial disease, excellent establishment of the crops, high yields and increased economic returns have created an impact upon the farmers for adopting this technology in larger areas. Production of tomato grafts has also produced a similar response. Farmer training has enhanced farmers’ knowledge about vegetable IPM practices and their advantages.

Project Highlights

Eggplant and tomato grafts on Solanum rootstocks has proven to be a very effective and practical method for combating bacterial wilt disease and other pest problems. Farmers have gained high economic returns from using this technology. The technological and economic impacts have encouraged more farmers to adopt the practice in larger areas.

Development of Eggplant Hybrids Resistant to Bacterial Wilt, Fruit & Shoot Borer and Root-knot Nematode

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Abstract

The heterotic performance for three agronomic characters were estimated in 25 hybrids of eggplant (Solanum melongena L.) involving twelve parents. Five hybrids, Kazla x BL-081, BL-114 x BL-083, BL-083 x SLS2, BLS5 x Uttara, and BL-099 x BLS4 produced higher number of fruits and yield per plant than the other hybrids. They also showed higher percent of heterosis for the above characters over their mid-parents and better parents. An additional 36 hybrids have been developed in 2001-2002 through half-diallel crosses involving nine pest-resistant parents and these will be tested in 2002-2003 for selecting high yielding, pest-resistant hybrids.

To test new hybrid lines in the field to determine their heterotic performance.

IPM Constraints

The cultivated eggplant varieties in Bangladesh are susceptible to fruit and shoot borer, bacterial wilt disease, and root-knot nematode, which are the most important pests of eggplant. Farmers fail to protect their crops from these pests even after repeated use of pesticides. It is possible to transfer resistant/tolerant genes to these pests to cultivated varieties through hybridization and to develop F1 varieties possessing high yielding and pest-resistance traits for on-farm use.

Research Methods

In 2000-2001, twenty-five hybrid lines were developed through half-diallel crosses using 12 selected eggplant varieties as parents. These were Uttara, Islampuri, Kazla, Mixture, BL-083, BL-081, BLS-114, BL-099, BLS4, BL-009, SLS2, and BLS5. Unfortunately, hybridization for all
cross combinations was not successful. In 2001-2002 winter season, the hybrids along with the parents were tested for their performance at BARI farm, Gazipur. Forty five-day old seedlings of the parents and the hybrid lines were planted in 7.5m long rows at 75cm spacing in RCB design with three replications; each row contained 10 plants. Standard cultural practices and recommended fertilizer rates were applied. No pest control measure was taken. Data were recorded from 5 randomly selected plants of each replication at flowering, and first harvest on plant height, fruit length and diameter, fruits per plant, fruit weight, and yield. Data were subjected to ANOVA, and the percent heterosis for fruit number and fruit weight per plant was calculated. General combining ability and specific combining ability could not be worked out as all the cross combinations were not successful.

In 2001-2002, hybrid seeds of 36 crosses and 9 parents were produced for heterosis study in 2002-2003. The nine parents which are involved in the cross combinations have multiple resistance to insect pests and diseases and these are BL-081, BL-083, BL-009, BL-113, BL-114, BL-099, Kazla, Islampuri and Uttara.

Results and Discussion

Heterotic performance of most of the hybrids was not satisfactory. However, five hybrids produced higher fruit yield per plant. These were: Kazla x BL-081 (1143g), BL-114 x BL-083 (895g), BL-083 x SLS2 (892g), BLS5 x Uttara (891g), and BL-099 x BLS4 (851g). These hybrids also showed higher percent of heterosis over their mid-parents and better parents (Table 1). Based on their higher yields, better fruit size and color, these hybrids were selected for further tests in the next season.

Table 1. Heterotic performance of five selected eggplant hybrids, BARI farm, Gazipur, 2001-2002 winter season.

<table>
<thead>
<tr>
<th>Cross combinations</th>
<th>Heterosis for fruit number (%)</th>
<th>Heterosis for fruit weight/plant (%)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mid parent</td>
<td>Better parent</td>
</tr>
<tr>
<td>Kazla x BL-081</td>
<td>-32.5</td>
<td>-53.1</td>
</tr>
<tr>
<td>BL-114 x BL-083</td>
<td>9.6</td>
<td>0.2</td>
</tr>
<tr>
<td>BL-083 x SLS2</td>
<td>7.8</td>
<td>-14.8</td>
</tr>
<tr>
<td>BLS5 x Uttara</td>
<td>19.2</td>
<td>15.3</td>
</tr>
<tr>
<td>BL-099 x BLS4</td>
<td>-1.1</td>
<td>-20.0</td>
</tr>
</tbody>
</table>

Impacts

Tests of the selected 12 eggplant parents showed that they possessed considerable variabilities for different agronomic characters. Although their general combining ability could not be determined, five hybrids showed higher heterosis for fruit number and fruit weight per plant. The results indicate that high yielding, pest-resistant eggplant varieties can be produced through hybridization.

Project Highlights

The overall results showed that five hybrids produced from crosses of the selected eggplant varieties have higher heterotic effects in respect of fruit bearing capacity and yields per plant.