

Market-oriented agriculture in Palestine <Part 3>

Production and use of grafted seedlings

In the Jordan River Rift Valley, we have been introducing grafting techniques through the Project for Strengthening Support System Focusing on Sustainable Agriculture in the Jordan River Rift Valley (ASAP) and the Project on Improved Extension for Value-added Agriculture in the Jordan River Rift Valley (EVAP), as part of the measures to manage soil-borne diseases to achieve high quality and steady production of vegetables. Actual activities were divided into establishment of nurseries, quality improvement of grafted seedlings, and verification test of grafting in experimental station.

We supported grafted seedling supply systems for large-volume and steady production through introduction of incubators, and improved nurseries to facilitate efficiency and technology extension. The target organizations were seedling companies and farmers' groups that were already producing vegetable seedlings. In the case of the seedling companies, although they had the capacity to produce a large quantity of seedlings, there were some problems such as quality control, contamination of different varieties, bacterial infection, and delays in shipment. As a result, there were some instances of losing the trust of farmers. Therefore, in addition to increasing quality of their grafted seedlings, improvement of the management system emerged as an important task. On the other hand, grafted seedlings produced by farmers' groups, which are available more cheaply, are extremely attractive to growers, and selling and trading of grafted seedlings between farmers' groups is promoted.



Introducing incubators



Grafting training

To improve quality of grafted seedlings, we conducted grafting technology workshops targeting farmers' groups. In these workshops, we explained in detail the advantages and benefits of using grafted seedlings, different kinds of grafting techniques, grafted seedling management using incubators, and cultivation techniques using grafted seedlings in fields. Moreover, we conducted practices to teach actual grafting

operation using root stock and scion. By repeating the lectures and practices, we could enhance quality of grafted seedling production techniques in various nurseries, achieving quality improvement of grafted seedlings.

For the selected farmers' groups, we conducted grafting verification test. To extend good practices to other farmers, we also conducted field days and training sessions. The verification test made clear the following;

- There was no clear difference in yields between grafted and non-grafted seedlings in the tomato cultivation with soil disinfection using solar heat. Effects of grafting was verified in soil-borne disease infected soil.
- While we could not confirm superiority of grafting for cucumber cultivation in summer. For cucumber cultivation in winter, we could confirm improved resistance to soil-borne disease, low temperature tolerance and extended yield period when using grafted seedlings.
- For watermelon cultivation, grafting effect was clearly demonstrated in terms of soil-borne disease resistance, plant vigor and yield, showing excellent results. This was widely reported in the local media, as it indicated the revival of watermelon production after the crop was decimated by soil-borne disease 20 odd years ago.



Grafted tomato

Grafted cucumber



Grafted watermelon

Field day

Furthermore, we summarized effect and profitability of cultivation using grafted seedlings as crop budgets. However, we have not been able to generalize the results due to the lack and dispersion of data. In future, we hope that grafted seedling use will be introduced more widely and effectively to enhance accurate understanding of benefits of using grafted seedlings by extension agents and farmers and to increase profitability of their production.