

Are Japan's cultivation techniques and the wisdom of creative Japanese farmers applicable?
– Case study of training activities at Tsukuba International Center -

Part 4: Pruning effects can be seen even with the determinate type tomatoes

Fruit vegetables such as Cucurbitaceae and Solanaceae require pruning. There are different pruning methods for different vegetables. For tomato plants, lateral branches are removed from the stem to ensure only one main stem. For eggplants, the lateral branches are removed, except for the two branches that grow from the node below the first flower. Leave the two lateral branches and if they become crowded, remove some leaves. For watermelon and other melons, remove the terminal bud at a low node when there are 4 to 5 primary leaves, and leave 2 to 4 vigorous vines that shoot out from the nodes between the stem and primary leaves. The purposes of pruning are to effectively manage pest control, growth and harvest. Pruning also aims to increase the quality of the products and to shorten the harvest period to intensify the farmland productivity. Some of the expected effects of pruning are; 1) avoidance of overshadowing crops due to crowding; 2) improved work efficiency; 3) reduction of pest and disease outbreaks; 4) timely harvest of a large number of uniformed fruits of similar sizes and quality; and 5) effective use of farming plots. The work accompanying pruning includes a) training of vines and fixing of the stem on support poles; b) disbudding exercise to remove small unnecessary lateral buds; c) in case of watermelons, removal of excess fruits, leaving only two well-shaped fruits, after around four fruits are produced on the four lateral vines; and d) other removal of leaves and terminal buds.

I would like to introduce an individual experiment related to pruning methods for tomatoes, which was conducted by a Samoan trainee this year (2008). The trainee is based at the Department of Crops, within the Samoan Ministry of Agriculture. His work entails technology extension using demonstration plots, problem analysis as part of the vegetable cultivation group activities, investigation into counter measures, and development of work plans. His problems at his work area are the low quality of imported seeds, insufficient production of seeds by the Ministry of Agriculture, and insufficient knowledge of pest control. In addition, due to careless crop management, improvement of crop quality is difficult, which impacts negatively on marketing and new market development. The main vegetables cultivated in Samoa are pumpkin, cabbage, cucumber, Chinese cabbage and tomatoes. Among these vegetables, the biggest challenge Samoa faces is how to produce a large fruit tomato that has a high market value. In Samoa, they grow red large fruit and determinate variety of tomatoes. When the seedlings are transplanted, they are fixed to a short support and are left to grow freely. With this method of cultivation, the harvests will vary in sizes and the total harvest does not increase. Therefore, the trainee examined which cultivation techniques in Japan can be applied to his situation, and then conducted an individual experiment to evaluate the effect of limiting fruit numbers and its training.

He used a red large fruit bearing determinate variety of tomato that is similar to the main variety cultivated in Samoa. They were planted in a plastic covering house as a shelter from rain, with 75 cm space between each plant and 100cm between rows. The number of fruit bearing branches was limited to two, three or four in different sections. The plants in these sections were trained towards the wire at 1.8 m above ground and one section was for plants that were left to grow freely as is commonly done in Samoa. The result was that as the number of fruit bearing branches increased from two to three, the number and amount of harvest increased. However, in the section with plants with four fruit bearing branches, the yield went down. The highest yielding section among the four sections was the one with plants with three fruit bearing branches. Pruning requires additional work such as disbudding and training. It also increases the cost, as training materials are necessary. However, pruning makes pest and weed control and harvest work more efficient, and makes it possible to harvest in a timely manner and reduce dropping and rotting fruits. We are positive that the trainee was convinced that pruning could lead to improvement in fruit quality.

Given the result of the individual experiment, the trainee is thinking of including in the post training action plan in his country, a plan to cultivate high quality and high yield tomatoes applying the pruning technique. In many developing countries, there is still little demand for intensive use of farmland and for improving market values including increasing fruit quality and controlling the harvesting period. Therefore, fruit vegetables are mostly grown on the ground without support or a trellis. It is considered that pruning techniques will attract attention from now on, as they increase work efficiency including timely harvesting, which in turn leads to an increased harvest.

