

## Process and Factors for development of Grid-shaped Shelterbelt Plantations in Kitanoyama, Izu-Oshima Island, Japan

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### Introduction

Wind direction, wind velocity, vegetation, physiognomy, division, culture, economic fabric and agriculture are important determinant of formation and tree species of the shelterbelts. These different factors are changing in the historical transition.

But relationship between the historical process of formation of the Shelterbelt Plantations and the social situation in Izu-Oshima remains to be elucidated. There are still many points to be clarified as to relationship between the Shelterbelt Plantations and the environment upon the tree species and the storm.

The purpose of this study is to clear the process of the formation and tree species in the Shelterbelt Plantations as shown from background: the environment, the culture, the society and the history. The target area is Kitanoyama in Izu-Oshima, where many Grid-shaped Shelterbelt Plantations have grown.

### Experimental

This research is survey, hearing and observation. We sent out questionnaires to 22 living units in target area at the end of August 2012. And these questionnaires were collected by form of visit at the beginning of September. In survey, queried forested age, tree species of beginning and now, aim of the grove, type of protect from wind and so on. In hearing, queried native place, reason of settlement, agriculture, aim of the grove, and so on. In observation, we measured to embankment, tree height and three species.

### Results

Most trees were *Camellia japonica* on the questionnaire, the hearing and the field observation. Next, many trees were *Prunus lannesiana* var. *speciosa*. The purpose of planting *Camellia japonica* is protection against wind and use of a seed as materials for oil. The wind type on the supposition is typhoon on the questionnaire. Objects for protection against the wind are outdoor grown vegetables, orchard, and greenhouse. Distribution and tree species vary on each households. However, it was common to have taken the enclosed form.

The field observation show the existence of alternate forested the shelterbelts by *Camellia japonica* and *Prunus lannesiana* var. *speciosa*. The hearing confirmed that the shelterbelts were forested on long-term viewpoint.

### Discussion

The target area is flatland and does not have the restraint as arable land. Kitanoyama lay among the two villages Motomachi and Okata. Moreover here was far from two villages. For this reason, this target area did not have aggressive use. For this area, readjustment was held in 1883 and 1946. In the time from 1906 to 1940, the lane increased between Izu-Oshima and Honshu. In addition, many colonists from Honshu visited Izu-Oshima. Owing to National policy during the World War II period and food shortage in postwar era, the upland field expanded in Izu-Oshima (Oshima Town 1999, 2000b). In order to protect cultivated land from Typhoon, the Grid-shaped Shelterbelts were made.

In the target area, main tree species of the shelterbelts is *Camellia japonica*. It is because *Camellia japonica* has many excellent by-product for the culture and industry. *Camellia* oil has been a main special product since Meiji era (Tsujiyama 1908). From Meiji era downward, the shelterbelts have combined with the function of seed utilization (Tachiki 1973). It is especially noteworthy that *Camellia japonica* and *Prunus lannesiana* var. *speciosa*. planted alternately at first. It is the reason that the growth of *Camellia japonica* speed is slower than *Prunus lannesiana* var. *speciosa*. *Camellia japonica* is strong. Its seed is material of oil. However, it has a shortcoming that growth is slow. To the contrary, *Prunus lannesiana* var. *speciosa* grows rapid. By alternately planting, component species of shelterbelts have changed to *Camellia japonica* deliberately.

The shelterbelts are made up of long-term and deliberate management by the people. Factors for development of the shelterbelts in Kitanoyama are Typhoon, agricultural transition, level landform, land readjustment, situation in Izu-Oshima, national vegetation and history.

Keywords: Shelterbelts, *Camellia japonica*, *Prunus lannesiana* var. *speciosa*, Izu-Oshima Island