

## Tropical cyclone activities and their impacts on greenhouses under Agricultural Disaster Compensation System

MORISHIMA, Wataru<sup>1\*</sup>, MOROZUMI, Masahiko<sup>1</sup>

<sup>1</sup>Nihon University

In recent studies, the specific anomalous tendency of steering flow to control a tropical cyclone track and stronger influences of tropical cyclones on subtropical East Asia have been pointed out in the western North Pacific. There is a viewpoint that this phenomenon is related with the global warming, and it is concern with the possibility of continuous tendency in future. In this study, to recognize the impacts of such a climate variation on a regional agriculture, we discuss the institutional issues including the business deployment of agricultural mutual aid associations as a specific example by the damage of horticultural facility in Okinawa.

The best track data, compiled by the Regional Specialized Meteorological Center Tokyo (RSMC Best Track Data), were used to clarify the interannual variation of the frequency distribution of tropical cyclone centers near the shore area of Okinawa Prefecture in late years. The result showed that the frequency of tropical cyclone center from June to October significantly increased around the west of Okinawa Island in the 2000s, and this was observed corresponding to the increasing damage of the horticultural facility in Okinawa.

Based on the results mentioned above, the major factors of damage to horticultural facilities and the business deployment of agricultural mutual aid associations in the agricultural disaster compensation system were analyzed in Okinawa Prefecture. Then the regional difference of damage to horticultural facilities and its influences on the agricultural disaster compensation system were discussed in the case within the jurisdictional district of the agricultural mutual aid association in Kunigami County, the northern part of Okinawa.

There is the continuity and a certain regularity of occurrence in the damage to horticultural facilities over the whole country, and Okinawa Prefecture has a high damage ratio. The occurrence of damage depends on the locations and existence time in passing typhoons, the wind direction and speed, and the form of green house covered by the mutual aid system. In the case of the jurisdictional district of agricultural mutual aid association in Kunigami County, that has the especially high ratio of damage to horticultural facilities in Okinawa Prefecture, the strong wind with typhoons and green houses with low resistance to wind cause the extent of damage. There are also the regional differences both of participation rate and of the damage ratio in each municipality within the district, related to the distinctions of implementation contents in the grant-aided project of the national and local governments to the construction of horticultural facilities, and to those of dominant crops. Therefore, the damage of horticultural facilities combines the aspect of natural disaster by typhoon and that of social disaster reflected in the grant-aided projects to the facilities and to encourage producing centers. These regional differences cause the conflicts of coverage options between areas.

It can be considered that the risk management of agricultural mutual aid association will have two types of change, that is, the correspondence with individualization, and the realignment of jurisdictional districts with the reorganization of agricultural mutual aid associations.

Keywords: tropical cyclone, typhoon damage, Okinawa, greenhouse, agricultural mutual aid association