KIKUCHI Kouji ed.:

Dannkyuu dojo to nougyou: Tokachi heiya wo dou ikasuka

(Terrace Soils and Agriculture: How to Make a Full Use of Tokachi Plains)

Tokyo: Kokon Shoin, 212 pp., 2008 (ISBN 978-4-7722-5220-1 C3061)

Geographical distribution of soils and volcanic ash, land productivity, development/alternation due to agricultural activities and soil conservation on Tokachi plains, eastern Hokkaido, are discussed comprehensively from aspects of pedology, geomorphology, and agricultural chemistry in this book. On Tokachi plains, cold farm products such as soybeans, azuki beans, potatoes and sugar beets are cultivated widely and intensively and thus the land of Tokachi plains is critically important for agricultural production in Japan.

Basically, Tokachi plains have low productivity due to their complicated topography with small-scaled plateaus. Soil fertility tends to decline through soil erosion and nutrient loss, which are caused by the time lag of snow melting, or ice melting. The author proposes various solutions for these problems from the aspects of topography formations, soil formations, and distribution of volcanic ashes. Furthermore, the author provides practical data on soil properties of the Tokachi plains, which is useful especially for those who have interest in Tokachi agriculture.

This book consists of 5 chapters. The first chapter deals with the formation of plateaus and distribution of soils and volcanic ash. The details of the Tokachi plains' topography are mentioned in the first part. Tokachi plains, not flat, but having hilly lands, plateaus, and lowlands have been influenced by various geomorphological events. From physiographic studies on river terrace formation in the glacial, interglacial and postglacial periods, the author reveals that Tokachi plains have complicated micro topography which was formed by ice erosion and weathering during over 2 million years. These findings are important to understand soil distribution and vegetation patterns. The second part comprises the plateau's topography and distribution of volcanic ash. In Japan, large areas of field are covered with various

volcanic ashes, which differ in weathering degree and physico-chemical properties. Particularly, characteristics of volcanic ash influence the accumulation of organic matters. In Tokachi plains, distribution of volcanic ash cannot be easily recognized as isopach lines, because of their complicated landform. The third part focuses on the distribution of soil, which is regulated by the topography of the plains in most cases. The author applies the Japanese soil classification system to soils of Tokachi plains and gives a comprehensive interpretation on their productivity.

The relationships between geographical features, distribution of soils and crop productivity are discussed in chapter 2. The land productivity is evaluated by the product of beet, since its cultivated area is 20–30% of the fields in Tokachi plains. Moreover, beet is known as a plant sensitive to soil nutrient and soil water due to its deep roots. In addition to the above-mentioned reason, information on the cultivation area of beet and its yield has been available for the past 33 years. Although the factors controlling the productivity are complicated, the author figures them out through detailed investigations on differences of soil properties (behavior), meteorological condition and landform. Under the consideration of these results, an applied soil classification map is provided by the author, which aims to contribute to land utilization and soil improvement. This map is a supportable tool not only for appropriate management of agriculture on Tokachi plains but also for promoting advanced studies and designing field experiment to improve land productivity towards more practical stage.

The history of the geographical features and soil change, caused by reclamation, is described in chapter 3. Agricultural landscape of Tokachi is considerably enjoyed by the residents and paying attention to this region is equivalent to conservation of land resources. The

importance of preservation and control for agricultural landscape of Tokachi plains is emphasized in this chapter.

The relationship between landform diversity, and meteorological disasters, is described in chapter 4. The author proposes provision against meteorological disasters with an appropriate management for cultivating land and an appropriate cultivator. The amount of damage by meteorological disaster in the Tokachi plain is massive, accounting for about 3.0–25.0% of the value of agricultural production per year. The author stresses the necessity to consider the plan based on careful research against disaster.

Abundant materials for understanding terrace soil in the Tokachi plains and research methods are introduced in chapter 5. Figures in this chapter compile information

on landforms, soil distributions, and soil profiles, to help our better understanding of relationship between each other.

The investigation and methodology that the author established in the Tokachi plain can be applied to other places. This book is an excellent guide for young researchers, students of graduate schools and engineers who are keen on learning about soil, topography and agriculture.

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