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The Maturing Processes of Field Reclaimed with Sub-surface Soil : The change of matter production during 17 years

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Abstract:

The maturing processes of field reclaimed with low fertile sub-surface soil was studied for 17 years since 1980 at University Farm, Faculty of Agriculture in the University of Tokyo. Six treatment plots containing the application of chemical fertilizer and two levels of farmyard manure combined with compost were established in both of the field with surface soil and sub-surface soil. A crop rotation of corn-barley-soybean-barley was continued and their yields were monitored. Yields in all plots with chemical fertilizer were high and were not affected by the application of manure in both fields with different soil, except corn grown in manure application plots with sub-surface soil. This indicated that the increase of organic matter in soil was not effective on yield when chemical fertilizer was applied. From the point of environmental conservation, it is a problem if some elements from manure flowed away, which needed more research. Yields in the plots with manure application and no chemical fertilizer were much lower than those in the plots with chemical fertilizer, especially in the field with sub-surface soil. Continuous application of manure, however, brought the increase of yield and, after about 15 years, yields in high manure application plots with sub-surface soil and in both manure application plots with surface soil were almost equal to that in chemical fertilizer applied plots. Therefore, no difference in yield was observed between the plots with sub-surface soil and with surface soil by the continuous manure application for 15 years.

Keywords:

Chemical fertilizer, Long-term experiment, Manure, Soil fertility, Yield

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