Agriculture in the 20th century, that achieved remarkable increase of the crop production, was largely dependent on intensive utilization of fossil fuels, fertilizer and pesticides. However, such industrialized agriculture has used natural resources excessively and inefficiently, and has been degrading ecosystems and creating a variety of environmental problems. In the Laboratory of Plant Production Systems, we examine the present agricultural practices from the viewpoints of the structure and function of the ecosystems to establish sustainable crop production systems with high yield as well as in harmony with the environment.
**Key words**

*Agricultural ecosystem, Cycling of materials, Agricultural systems, Crop production, Farming systems, Land use, Soil fertility, Sustainable agriculture, Industrial agriculture, Spatial variation of crop growth and natural resources, Nitrogen fixation*

**Recent publications**

**The Effect of Precipitation on Growth of No-tillage Soybean in the Upland Field Converted from Paddy Field.**
Jpn. J. Crop Sci. (in press)

**Effects of the Long-term Application of Anaerobically-digested Cattle Manure on Growth, Yield and Nitrogen Uptake of Paddy Rice (*Oryza sativa* L.), and Soil Fertility in Warmer Region of Japan.**
Plant Prod. Sci. (in press)

**Physicochemical changes in soil following land use change from paddy fields to greenhouse and upland fields in the southeastern basin of Dianchi lake in Yunnan province, China.**
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**Dietary nitrate loads on cows in dairy farm near Lake Dian, Kunming City, Yunnan Province, China.**
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