Advanced support system based on precise meteorological data for citrus orchards

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Abstract

Rural districts located in mountainous or hilly regions are not only important in terms of food production but are also where civilization, culture and spirituality originated and are preserved. The policies supporting the sustainable development of agriculture in such regions are important in many countries. These policies will gain importance in the face of climate change because the complex terrain results in small and widely distributed farm lands with limited productivity, and these will be the first to be negatively affected. Many attempts have been made to use various meteorological conditions to increase the productivity of agriculture in the hilly and mountainous terrains of Japan. However, most of the meteorological data collected has not been fully used. We proposed that to optimize agricultural output from the mountainous and hilly regions, it is necessary to acquire precise meteorological data with three characteristics: precise position estimates, substantial data collection, and the availability of continuous data covering the past, present and future. We have developed a support system for the management of a database of precise meteorological data, including air temperature, humidity, solar radiation, precipitation and reference evapotranspiration. Data in the database have been developed to estimate data, having a few tens of meters resolution, based on a nearby existing observation station and its data: past, present and future. This system, with its precision meteorological data, should make citrus cultivation more profitable because Japanese citrus orchards are located in hilly areas, and the gradient of ~45% of the orchard area has over a 15 degree slope. We expect that this system will contribute to developing advanced and flexible management systems of cultivation that respond to meteorological fluctuations. We will present the support system under the development of citrus orchards.

Keywords: Precise meteorological data; Cultivation management; Agricultural support system; Citrus orchard; Hilly areas

References


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