Abstract

Mandarin orange (*Citrus unshiu Marc.*) is one of the most famous fruit products in Japan. As operations in a mandarin orange plantation requires hard works for farmers. New cultivation technology was developed to reduce such farmers' labor and produce high quality productions. This "Mulching and Drip irrigation" cultivation method makes many advantages on farmers, because it can reduce cost and time for weeding and fertilizing. Farmers would produce high quality mandarin oranges if do could control the drip irrigation system to keep soil moisture condition properly. But is not known what is the best soil moisture cannot for good mandarin orange production. They are trying to find the best way empirically, by watching the color of leaves and/or fruits or shape of trees. We have already monitored soil moisture content in a coffee plantation field in Hawaii. But this monitoring system needs an expensive data logger. So we developed cheaper system for soil moisture monitoring. We installed a Field Server, which connected the soil moisture sensor and the network camera in the experimental farm. Field Server is automatic monitoring system developed by NARC (National Agricultural Research Center). It is composed of CPU (Web server), AD converter, DA converter, Ethernet controller, Wireless Access Point, and so on. Network between the experimental farm and our laboratory was connected using a VPN. Finally, we succeeded in acquiring environmental factors, such as soil moisture or temperature, and the images of a mandarin orange tree on real time. Observed data w, stored automatically in the server and could be used for decision-making.