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지표피복과 영농활동이 기상 및 토양 관측에 미치는 영향

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Effects of Land Cover and Farming Activities on Weather and Soil Observations

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Meteorological observations at sites that represent actual farming activities are essential to ensure the provision of useful agro-meteorological services, but Automated Agricultural Observing System (AAOS) of Korean Meteorological Adm\inistration has fundamental limitations because all the agro-meteorological observations are conducted for lawns rather than actual farming environments. In this study, we analyze the effects of ground surface cover and farming activities on observation data by comparing common weather and soil observation elements recorded by the National Center for Agro-Meteorology (NCAM) tower installed at an actual farming site and the AAOS, which is located near the tower. The months of August and October (before and after harvest time, respectively) were selected as the analysis periods. As there were differences in the height and depth of each observation element, the height and depth with the smallest differences were selected as the objects of comparison. Air temperature observed at the AAOS were lower than those at the NCAM before and after harvest time, and constant differences were maintained, without showing considerable diurnal changes. Water vapor pressure observed at the NCAM were always higher than those at the AAOS, and the difference in August was larger than that in October. Reflected shortwave radiation observed at the AAOS tended to be higher than that at the NCAM. The soil observation elements showed bigger differences compared to the meteorological observation elements. In August, soil temperature observed at the NCAM was lower than that at the AAOS with smaller diurnal changes because most of the rice paddies were filled with water. The soil moisture observed at the NCAM continuously maintained field moisture capacity irrespective of precipitation, but the those at the AAOS showed a decreasing trend, following an increase after rainfall. The trend changed in October. Soil temperature observed at the NCAM showed similar daily means with higher diurnal changes

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than those at the AAOS. Soil moisture observed at the NCAM were continuously higher, but both AAOS and NCAM showed similar trends. The above results show that a considerable difference is generated in the atmospheric and soil environments by ground surface cover and farming activities. As a follow-up after relocating the agro-meteorological observation equipment of AAOS to locations near farming lands, we propose that the equipment be shifted to actual farming sites such as rice paddies, farms, and orchards, instead of lawns, so that the results are representative of the actual agro-meteorological cultural observations.