

## [P2] Farming System

2021年9月9日(木) 12:15 ~ 14:00 Room 2 (Poster) (Farming System)

12:15 ~ 13:00

### [P2-01] Soil Fertility Decline by Repeated Cropping of Rice for Whole Crop Silage – A Case of Mifune Town in Kumamoto Prefecture, Japan

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Production of rice for whole crop silage (WCS rice) is popular in southern Kyushu, especially in Kumamoto. At Mifune town in Kumamoto, WCS rice has been grown with a lower fertilizer input than edible rice, although both panicle and straw of WCS rice are removed from the field. This study aimed to evaluate the effects of repeated cropping of WCS rice on soil properties and rice productivity. From 2014, a monitoring survey has been carried out at 8 adjacent fields (39 sites) managed by the same farmer. WCS rice (Minamiyutaka) has been grown in 4 fields from around 2008 and edible rice (Hinohikari) has been grown in the other 4 fields. The balances of N, P, K and Si during the rice cropping in 2016 were estimated to be positive in edible rice fields and negative in WCS rice fields. Compared to the soil properties in the edible rice fields, the topsoil in WCS rice fields showed lower concentrations for exchangeable K (28-54%), hot  $\text{HNO}_3$ -extractable K (61-69%), available Si (69-73%), mineralizable N (76-84%), and available P (77-80%). The dry matter weight of rice seedlings grown in small pots filled with the surface soils collected from 39 monitoring sites in 2018 was positively correlated with the concentration of available N ( $r = 0.85$ ), exchangeable K ( $r = 0.74$ ), and available Si ( $r = 0.72$ ) in the soil. A nutrient omission pot experiment using a surface soil collected from one of the WCS rice fields further revealed that the dry matter weight of rice at milk ripe stage was decreased by about 40% by either N or K omission.