Oral sessions | KL-02 | O24: Smart Farming (Remote Sensing, ITC)

[O24] Smart Farming (Remote Sensing, ITC)

*Sponsored by Asian Association of Agricultural Colleges and Universities (AAACU)
Chair: Yoshio Inoue (The University of Tokyo, Japan)
Chair: Sutkhet Nakasathien (Kasetsart University, Thailand)
Chair: Hiroshi Ehara (Nagoya University, Japan)
Fri. Sep 10, 2021 9:45 AM - 11:45 AM Room 2 (Oral) (Farming System)

10:55 AM - 11:10 AM

[O24-05]Yield Increase and Fertilizer Decrease by Precision Fertilization in Transplanted and Direct-Seeded Rice in the Northern Part of Japan

○Hiroyuki Shiratsuchi, Hiromi Imasu, Keiko Ito, Masami Furuhata (Division of Lowland Farming Research, Tohoku Agricultural Research Center, National Agriculture and Food Research Organization, Japan)

NDVI maps taken by a drone and yield maps created by a yield measurement system are available for rice production in Japan. We also developed a lodging measuring technology. The objective is to increase the yield without lodging by precision fertilization in the northern part of Japan. Precision basal-dressing and top-dressing on-farm trials were conducted in transplanted and direct-seeded rice in 2017 - 2019. The precision basal-dressing rate of each paddy field was calculated based on lodging degree and yield in the previous year. The top-dressing maps were obtained based on NDVI maps and top-dressing rate functions adjusted based on lodging degree and yield in the previous year. Fertilizer was broadcasted according to top-dressing maps with an unmanned industrial helicopter. In the transplanted rice, the precision basal dressing increased fertilization rate by 7 kgN/ha and yield by 270 kg/ha, without change of lodging degree. The precision top dressing decreased fertilization rate by 18 kgN/ha and increased yield by 160 kg/ha with slight increase of lodging. In the direct-seeded rice, the precision basal dressing decreased fertilizer by 14 kgN/ha and increased lodging slightly and yield by 160 kg/ha. The precision top dressing decreased fertilizer by 4 kgN/ha and lodging slightly, and increased yield by 310 kg/ha. The estimated benefits ranged from 11,890 to 50,380 yen/ha. In conclusion, the precision fertilization increased yield and decreased fertilizer, and consequently increased the benefits.