[O12] Concepts, Prospects, and Potentiality of Crop Production in East Asia

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Chair: Takeo Sakaigaichi (Kyushu Okinawa Agricultural Research Center, National Agriculture and Food Research Organization, Japan)
Chair: Hiroshi Ehara (Nagoya University, Japan)
Thu. Sep 9, 2021 2:30 PM - 4:30 PM Room 1 (Oral) (Field Crop Production)

2:50 PM - 3:10 PM

[O12-02]Nationwide Evaluation and Development of Direct Seeding Technology of Rice with Iron-Coated Seeds in Japanese Fields

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Water seeding (seeding onto a flooded soil) is advantageous over wet seeding (seeding after draining the puddled soil) in saving water and suppressing weeds. However, water seeding is rarely practiced in Asia because seeds are buoyant and float after puddling. Iron-coated seeds were invented to make water seeding feasible through increased seed density. This study aims to evaluate and improve direct seeding with Fe-coated seeds in fields to disseminate this technology nationwide. The study was conducted from 2008 to 2019 in 260 fields. Crop establishment was successful when farmers drained the fields after seeding at the coleoptile or 1st leaf emergence. However, uniform drainage of puddled fields requires time, leading to uneven seedling growth and preventing timely herbicide application. We recommended the installation of an open ditch to facilitate drainage. Drainage duration after seeding should be reduced when the temperature is below 17℃. The regression curve of grain yield versus seed rate demonstrated that grain yield is equivalent to the transplanted rice at the seed rate of 40-50 kg/ha. The cost analysis clarified that working time during the planting season is reduced by 30% compared to that of transplanting and that the material cost was slightly decreased due to the increase in the number of herbicides used. The Fe-coated seeds performed well even in non-puddled soil. As of 2019, Fe-coated seeds were popular for direct seeding of Japan. We propose 5 guidelines oriented for sustainable direct seeding with high grain yield.