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Oral sessions | Farming System | O23: Crop Modeling: Recent Progress and Applications

## [O23] Crop Modeling: Recent Progress and Applications

Chair: Hiroshi Nakagawa (National Agriculture and Food Research Organization, Japan)

Chair: Xinyou Yin (Wageningen University and Research, Netherlands)

Thu. Sep 9, 2021 5:00 PM - 7:00 PM Room 2 (Oral) (Farming System)

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5:20 PM - 5:40 PM

### [O23-02] Potential Value of Seasonal Climate Forecast and Crop Modelling in Identifying Optimal Management Practices in Tonga

(Invited Speaker)

<sup>○</sup>Kwang-Hyung Kim<sup>1</sup>, Steven Crimp<sup>2</sup> (1.Climate Services and Research Division, Asia Pacific Economic Cooperation Climate Center, Korea, 2.Climate Change Institute, Australian National University, Australia)

The value of improved seasonal forecasts for the agriculture sector depends on a wide range of complex and interrelated factors. These include forecast accuracy – including accuracy at relevant spatial resolution and lead times, forecast adoption rates, and farmers' attitudes to risk. In the study we focused on addressing only a small component of the first factor by testing the utility of the seasonal forecasts in informing a number of on-farm management decisions for swamp taro growers in Tonga. In terms of specific recommendations derived as part of the integration of the seasonal forecasts and a crop model calibrated using ground-truth data, it was clear that the use of targeted irrigation for specific growth stages resulted in significant improvement in mean yields across the whole year. The simulation results also suggested that planting a taro crop in the March to May period and using the seasonal forecast to help inform decisions such as planting density, fertiliser management, and irrigation can successfully lead to improved production in most years examined. During my presentation, some other alternative approaches will be presented as well. Overall, our results indicate that using the seasonal forecasts can improve potential crop yields against seasonal climate variabilities if used to alter the management decisions above. Nevertheless, this approach does carry more risk to the individual farmer and thus should be more fully explored with further analysis of farm management decisions and sensitivity studies.