
Oral sessions | Farming System | O21: Cropping System / Crop Rotation

[O21] Cropping System / Crop Rotation

Chair: Katsuyoshi Shimizu (Kagoshima University, Japan)

Chair: Weidong Cao (Chinese Academy of Agricultural Sciences, China)

2021年9月9日(木) 09:45 ~ 11:45 Room 2 (Oral) (Farming System)

10:25 ~ 10:40

[O21-03] Effects of Ridging and Fertilizer Application on Crop Yield and Growth under Unstable Water Environments

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The impact of climate change is expected to be more severe in semi-arid and arid ecosystems. Heavy rainfall and flooding events have recently become common occurrences in such regions, and it is essential to improve cultivation management practices to optimize crop productivity. The aim of the present study was to evaluate the effects of cultivation practices such as ridging and fertilizer application methods on crop yield and growth under unstable water environments. The experiments were conducted over three years (2016-2018) in experimental fields in semi-arid sub-Saharan Africa, northern Namibia. Pearl millet and cowpea were grown in the field, and the crop parameters were evaluated under different ridging and fertilizer treatments. According to the results, ridge formation by strip tillage (pulled by a small two-wheel tractor) led to proper drying of the soil, and flooding stress was prevented, which, in turn, enhanced early growth and increased yield for pearl millet and cowpea. In addition, our results showed that the crop growth from the tillering stage to the early reproductive stage is important under unstable water environments. In particular, the ridging minimized the risk for crop loss, particularly when applied in combination with manure fertilizer. Further studies analyzing crop growth are required to establish the optimal manure fertilizer quantities required and appropriate timing of chemical fertilizer application under unstable water environments.