
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)

Thu. Sep 9, 2021 9:45 AM - 11:45 AM Room 2 (Oral) (Farming System)

10:40 AM - 10:55 AM

[O21-04] Enhancement of Drought-Tolerance of Sorghum by the Close Mixed-Planting of Pearl Millet

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The consecutive occurrences of flooding and drought in the same place could increase worldwide in near future due to climate change. Through a series of experiments conducted in both humid Japan and semi-arid Namibia, we proved the hypothesis that wetland crop species and drought resistant upland species can help each other under flood and/or drought conditions when their root systems tightly entangle each other, termed close mixed-planting. Under flood conditions, this planting system allows the roots of wetland crops, such as rice, to supply oxygen to the roots of upland crops, such as pearl millet and sorghum. In turn, the roots of mixed cropped upland species supply water to the roots of counterpart wetland crops under drought conditions. The close mixed-planting may be one of the solutions to overcome crop failure by consecutive occurrences of flooding and drought in the same place. In north-central Namibia, some local farmers practice the close mixed-planting of pearl millet and sorghum, their staple foods. Both crops are drought tolerant, but pearl millet is much stronger than sorghum to dry conditions. In contrast, sorghum grow better in wetter conditions. By this system, pearl millet roots would, most probably, supply water to sorghum roots under drought condition, mitigating drought effects on sorghum plants. Local farmers commented that sorghum can be grown in much drier places than before by this cropping system. In this paper, we report on the close mixed-planting of sorghum and pearl millet in farm fields in Namibia and greenhouse pots in Botswana.