

## **Impact of alternative wetting and drying on the soil surface organic matter in a lowland paddy field**

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Ponded water in lowland paddy cultivation has a role on soil biomass accumulation, decomposition, and nutrient availability. However, alternative wetting and drying (AWD) is a common phenomenon under minor irrigation systems due to scarcity of water. The AWD process may have an effect on the soil organic matter (SOM). Therefore, the effect of several cycles of varying length of AWD conditions on SOM content at the soil surface was investigated using Lysimeters for a period of 98 days. The experiment design was factorial complete randomized design with 4 treatments; *i.e.* 4 days dry spell (T1), 12 days dry spell (T2), 20 days dry spell (T3) and 4 days dry spell with paddy (T4). Soil samples from the surface were collected at 14 days interval and the SOM contents were measured. Results show significant differences among the treatment combinations. The accumulation of SOM after AWD water management practices is higher for T1 followed by T2, T3 and T4. The surface SOM content has reduced by 19%, 53%, 86% and 49% of the initial SOM content for T1, T2, T3 and T4, respectively. Shorter dry spells enhance the organic matter accumulation compared to longer dry spells by creating anaerobic condition. On the other hand, organic matter degradation is higher in longer dry spells aerobic condition. This finding may help to take decisions on correct water management practices to optimize organic matter dynamics in lowland paddy fields.

**Keywords:** AWD, Decomposition, Low land paddy, SOM, Water management.