

## [P1] Field Crop Production

Thu. Sep 9, 2021 12:15 PM - 2:00 PM Room 1 (Poster) (Field Crop Production)

12:15 PM - 1:00 PM

### [P1-17] Improved Fertilizer Use Efficiency of Rice by Deep-Place Fertilization Method

\*Nominated for Presentation Awards

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Deep-Place Fertilization (DPF) method is known to increase rice productivity than the conventional broadcast fertilization method in paddy field with improving nutrient use efficiency. However, no information is available for root traits suitable for DPF method. The present study evaluated the effects of DPF on root growth and nitrogen(N) use efficiency by field and root box experiments using rice cultivar Akitakomachi. Ammonium sulphate, slow-release N fertilizer used as N source. Nutrient mixed in soil used as control whereas nutrient ball placed in 7cm (DP1), 7cm and 15cm (DP2) depth of soil was the treatment condition. In DP2 treatment, fertilizer used in half amount in each position. At heading stage, greater root length, root surface area found at both DPF conditions compared to control especially at deep soil layer (below 10cm from soil surface). Increased surface area of deeper roots allowed plants to uptake more N during the ripening period. At maturity, N accumulation in above-ground parts found higher in DPF treatments and this resulted in higher yield production. The allocation of root to deeper position was supported by root box experiment. Increased root accumulation was found just below the fertilizer position in DPF conditions which indicates that DPF method induced root growth toward fertilizer. Taken together, deep fertilization induces the root growth to the lower layer of soil which improves N use efficiency and yield production.