

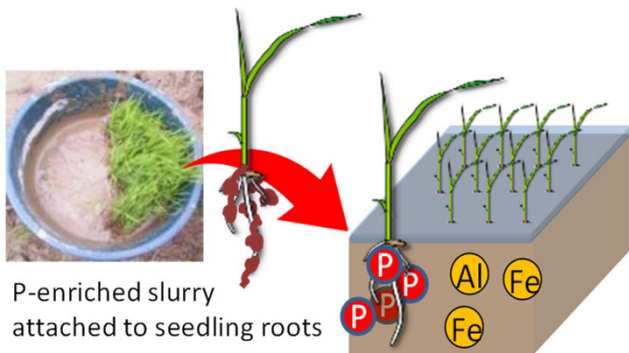
移植苗のリン浸漬処理はイネの施肥効率を改善し低温ストレスを回避する

Dipping rice seedlings in phosphorus (P)-enriched slurry at transplanting increases yield and avoids cold stress of rice for P-deficient soils in the tropics

作物の三大栄養素の一つであるリンは、土壌に含まれる鉄やアルミニウムの酸化物と強く吸着するため、施肥をしてもイネに吸収されにくい。リン肥料を加えた泥を苗の根に付着させてからイネを移植するリン浸漬処理は、リン吸着能の高い土壌でも施肥効果が大きく、従来の施肥法に比べて生育日数を短縮するため、生育後半に気温が低下する栽培環境では、登熟不良の改善にも効果をもつことを明らかにした。肥料投入量が限られ、リン吸着能の高い土壌や生育後半の環境ストレスが生じやすいサブサハラアフリカのイネ生産性改善策として期待できる。

P-deficient and P-fixing soils restrict rice production in the tropics. We identified that dipping seedling roots into P-enriched slurry before transplanting (P-dipping), with optimal P concentration in slurry at 1.8–2.6% and dipping duration less than 2h is a promising technique to increase rice yields with minimal fertilizer input even under high P-fixing soils. The effect was particularly large under a cool climate condition because the technique shortens days to heading compared to conventional P application via broadcast and avoids low temperature stress.

\*Different alphabets in Fig. 2 and Fig. 3 indicate significant differences at 5% (Tukey's HSD).



P-enriched slurry attached to seedling roots

図1 リン浸漬処理の手法

Fig. 1. An illustration of the P-dipping technique

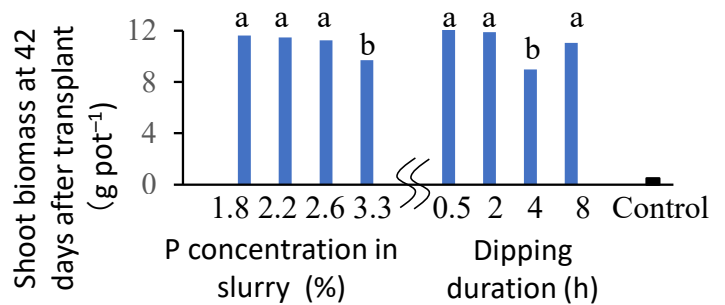


図2 リン浸漬処理の浸漬時間と浸漬リン濃度の効果  
Fig. 2. Effect of P conc. in slurry & dipping duration

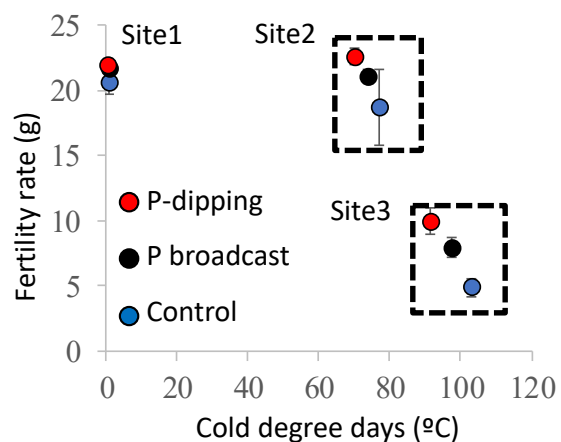
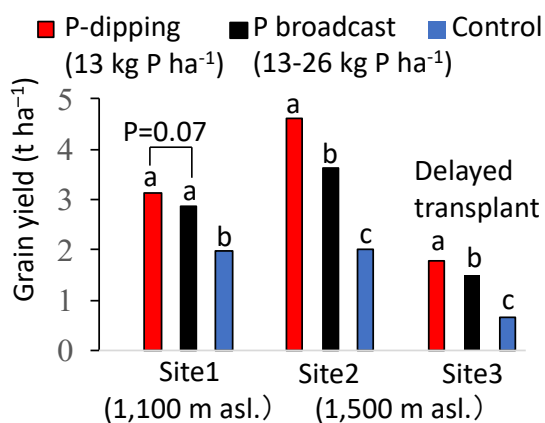


図3 マダガスカルの農家圃場におけるリン浸漬処理の増収効果(左)と生育日数短縮による低温ストレスの回避効果(右)  
Fig. 3. P-dipping effect on yield and fertility rate of lowland rice production in Madagascar highlands. Cold degree days is the sum of daily mean temperatures below 22 °C from 15 days before to 7 days after heading. Fertility rate is the product of filled grain weight and filled grain rate.