

一穂粒数を増加させるSPIKEは低収量環境でイネの籾収量を向上させる

SPIKE, a quantitative trait locus for increasing the number of spikelets per panicle, enhances rice grain yield under low-yield conditions

イネはアジア・アフリカにおいて主要作物の一つであるが、低肥沃度土壌が広がり、農家が十分な肥料を購入できない地域では、低投入でも安定した収量を得る品種の開発が必要である。近年同定された一穂粒数を増加させる量的遺伝子座SPIKEは、低収量環境(5t ha⁻¹以下)では、穂数を減少させないことで、m²当たり籾数を増加させ、増収に寄与することが明らかになった(図1~3)。今後、SPIKEをアジア・アフリカの低肥沃度土壌や少量施肥栽培に利用することにより、イネの生産性の拡大が期待できる。

Rice is an important food source in Asia and Africa where nutrient-poor soils are predominantly extensive and farmers lack the finances to purchase sufficient fertilizer. Therefore, it is necessary to develop genetically improved rice varieties with high nutrient-use efficiencies. We elucidated that SPIKE, a quantitative trait locus for increasing the number of spikelets per panicle, did not decrease the number of panicles under low-yield conditions (< 5 t ha⁻¹), which led to more spikelets m⁻² and thus higher yield (Figs. 1 – 3). The results indicate that SPIKE should be used in regions where soil fertility is poor, or where farmers cannot purchase adequate fertilizer.

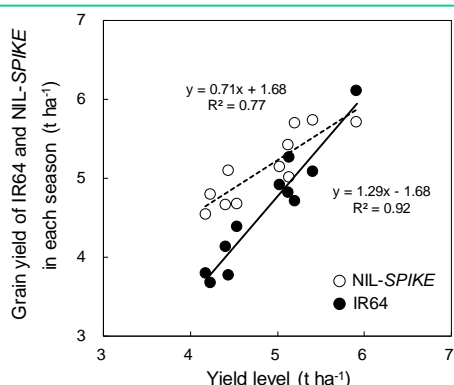


図1 IR64とNIL-SPIKEの11栽培試験での籾収量比較

Fig. 1. Comparison of grain yield between IR64 and NIL-SPIKE across 11 seasons

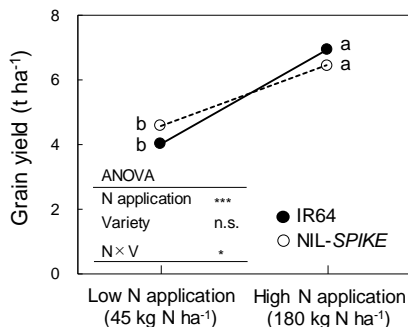


図2 低Nおよび高N区でのIR64とNIL-SPIKEの籾収量比較

Fig. 2. Comparison of grain yield between IR64 and NIL-SPIKE under low- and high-N applications

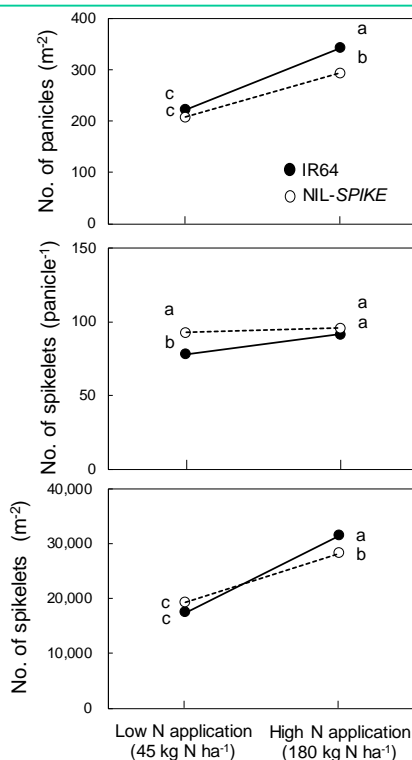


図3 低Nおよび高N区でのIR64とNIL-SPIKEの穂数、一穂粒数、m²当たり籾数の比較

Fig. 3. Comparisons of the number of panicles m⁻², the number of spikelets per panicle, and the number of spikelets m⁻² between IR64 and NIL-SPIKE under low- and high-N applications