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Towards the vertical harvest space in rice

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The multi-canopy rice cropping system in a field. Photo courtesy of Hajrial Aswidinnoor.

Increasing rice production is of paramount importance to meet the world's demand for this staple food crop. On the other hand, many countries see reduced rice field acreage for other economic purposes, such as housing development and public infrastructure.

Through genetic and breeding approaches, we propose to increase rice production through the occupation of upward or vertical spaces using the concept of vertical agriculture. This multi-canopy method utilizes short and tall rice genotypes planted in the same field. The tall plants form a canopy, thereby utilizing the vertical harvest space.

Results of this research, recently published in *Agronomy Journal*, indicated a yield increase in the multi-canopy system compared with the monoculture, and there were variations of genotypic response to the multi-canopy system. A new objective for a rice-breeding program could be to develop lines suitable for rice in a vertical agriculture system. The authors recommend that scientists carry out research on agronomic applications related to this new cultivation method, such as direct seeding, ratio of seed quantity mixture, and mechanization.

The authors hope that these initial results will encourage many breeders and researchers to further develop the multi-canopy system and utilize vertical harvest space as an effort to increase rice production worldwide.

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Adapted from Widyastuti, L.P.Y., Suwarno, W.B., & Aswidinnoor, H. (2020). Genotype by environment analysis on multi-canopy cropping system towards vertical harvest space in rice. *Agronomy Journal*, *112*, 4568–4577.

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