

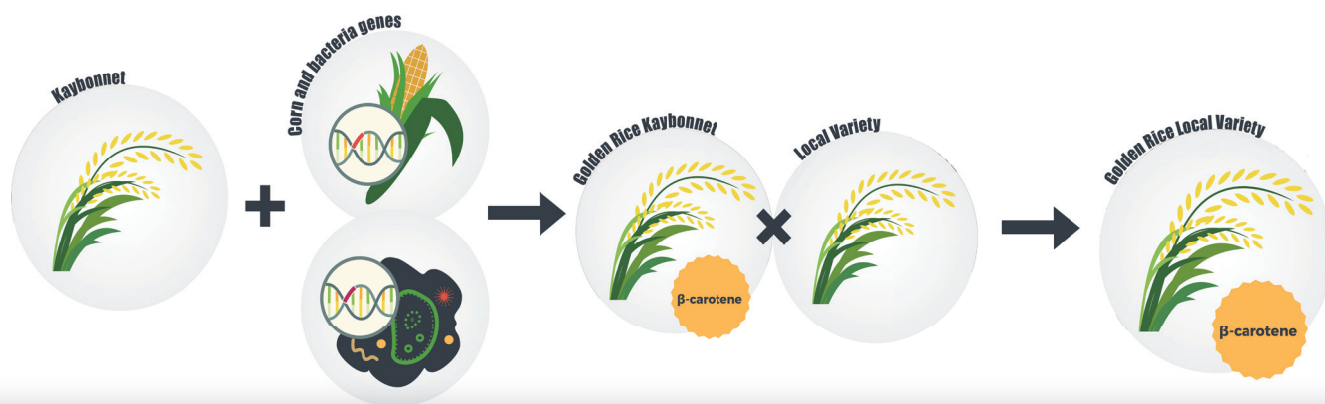
THE ROAD TO GOLDEN RICE: DEVELOPING LOCAL VARIETIES

Each step in the Golden Rice journey is taken to ensure its suitability and safety for the communities that need it the most. To bring Golden Rice from proof-to-concept to a market-ready variety, scientists and breeders at IRRI, DA-PhilRice, and BIRRI introduced the beta-carotene producing GR2E Golden Rice trait to popular inbred rice varieties through marker-assisted backcross breeding. A series of confined tests during 2015-16 demonstrated that GR2E Golden Rice Introgression lines have

the same agronomic, yield, and grain quality characteristics as its ordinary counterparts, with the added benefit of beta carotene in its grain.

This data was submitted as part of the technical dossier for the successful regulatory approvals in Australia, New Zealand, Canada, the United States of America, and the Philippines, and recently published by Swamy et al (2021) in Nature Scientific Reports.

THE GOLDEN RICE PROCESS



*Initial local varieties include PSB Rc82 in the Philippines and BIRRI dhan29 in Bangladesh

Reference:

Mallikarjuna Swamy, B.P., Marundan, S., Samia, M. et al. Development and characterization of GR2E Golden rice introgression lines. Sci Rep 11, 2496 (2021). <https://doi.org/10.1038/s41598-021-82001-0>

KEY FINDINGS



FINDINGS



IMPACT TO FARMERS



IMPACT TO CONSUMERS

The stability and inheritance of the Golden Rice trait is confirmed in each generation.

The beta-carotene gene can be transferred to inbred rice varieties preferred by farmers through marker assisted backcross breeding.

Transferring the gene to inbred varieties can help keep Golden Rice prices comparable to ordinary rice counterparts once it's available in the market.

Agronomic, yield and grain quality traits of Golden Rice are the same as its ordinary rice counterparts.

Farmers using typical farming practices can expect their Golden Rice harvest to perform just as well as its ordinary rice counterparts.

Since the same farming practices will be used for Golden Rice, consumers can expect Golden Rice to have similar costs to ordinary rice counterparts.

The beta-carotene content varies among the different rice varieties used, but even the lowest available content can provide 30% of the estimated average requirement (EAR) for vitamin A of young children.

The Golden Rice varieties that will be introduced can provide the intended 30% EAR for vitamin A, regardless of variety planted.

The Golden Rice varieties that will be introduced can provide the intended 30% EAR for vitamin A, at no additional cost.

The beta-carotene content is slightly higher during wet season harvest, but even the lowest available content can provide 30% of the estimated average requirement (EAR) for vitamin A of young children.

The Golden Rice varieties that will be introduced can provide the intended 30% EAR for vitamin A, regardless of season.

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Despite the success of existing nutrition interventions, vitamin A deficiency continues to be the leading cause of preventable childhood blindness and increased risk of infection for over **190 million children worldwide**.

Golden Rice and other rice biofortification initiatives can serve as a complementary pathway to improved nutritional status.