GOLDEN RICE PROGRAM: Delivering Golden Rice to Filipino Farmers and Consumers
Golden Rice is an ordinary rice improved with beta carotene (a source of vitamin A) and gives the grain its golden color.

Golden Rice is developed through genetic engineering and is intended to be introgressed into popular, high-yielding rice varieties.

What is Golden Rice?

[Images of rice varieties: Paddy, Unpolished, Polished]
Is Golden Rice safe?

YES. Golden Rice had undergone rigorous biosafety regulations (Health Canada, FSANZ, US-FDA, DA-BPI).

Golden Rice is as safe as ordinary rice, with the added benefit of beta-carotene in the grain.
Is there enough beta carotene in Golden Rice?

One cup of cooked “Golden Rice” can provide 30 to 50 percent of the estimated average requirement (EAR) of vitamin A for preschoolers, and two cups for adults (pregnant and lactating mothers).

1. Beta-carotene content is highest upon harvest, but gradually reduces until it reaches a stable level two months after harvest.

2. Beta-carotene content largely stabilizes after two months of storage and is measured.

3. Exposure to heat affects beta-carotene content to some extent. Measurements on reductions caused by parboiling and cooking are also recorded.

4. Remaining beta-carotene content at this stage can provide 30-50% of the estimated average requirement (EAR) for vitamin A of young children and pregnant and lactating women.
Potential contribution of Golden Rice to vitamin A RNI and EAR in the Filipino diet.

<table>
<thead>
<tr>
<th>Physiologic Group</th>
<th>Mean one-day intake of rice (g)</th>
<th>Vitamin A Contribution from Golden Rice (µg)</th>
<th>RNI (%)</th>
<th>EAR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children, 6 mo-5 y</td>
<td>87.3</td>
<td>63.9</td>
<td>16.0</td>
<td>32.1</td>
</tr>
<tr>
<td>Children, 6-12 y</td>
<td>178.6</td>
<td>130.7</td>
<td>29.1</td>
<td>40.8</td>
</tr>
<tr>
<td>Pregnant Women</td>
<td>234.7</td>
<td>171.8</td>
<td>19.1</td>
<td>39.7</td>
</tr>
<tr>
<td>Lactating Women</td>
<td>281.9</td>
<td>206.3</td>
<td>20.6</td>
<td>47.7</td>
</tr>
</tbody>
</table>

Notes: Beta-carotene concentration after 3 months of storage: 3.5 µg/g (IRRI, 2021)
Beta-carotene conversion factor: 4.78 (IRRI, 2021)
Loss from cooking is not considered

DOST-FNRI and IRRI, 2021 (unpublished)
Golden Rice can improve the diets of children—more than half of whom are not consuming sufficient vitamin A.

How can Golden Rice help?

• Golden Rice can provide an additional source of vitamin A in the diet of the Filipinos.
• With daily intake, it can be a sustainable source of Vitamin A.
• Hence, a promising complementary intervention to help address VAD
Our diet typically lacks vit A

Proportion of Population Groups with Inadequate Dietary Intake of Vitamin A based on EAR: Philippines, 2018-2019

Source: DOST-FNRI Expanded National Nutrition Survey 2019
Rice and the Filipino diet

Mean one-day household food intake by food group and percent contribution to total intake: Philippines, 2018-2019

Source: DOST-FNRI Expanded National Nutrition Survey 2019
Vitamin A Deficiency (VAD)

- VAD is caused by chronic lack of vitamin A in the diet
- Inadequate dietary intake of vitamin A is high in the Philippines
- VAD children also have high prevalence of undernutrition and anemia
- VAD is the leading cause of preventable blindness in children
- VAD also weakens immune system vs infections (diarrhea, pneumonia)
VAD remains a public health concern in the Philippines

- 15.5% prevalence nationwide
- Age groups at risk of VAD: 6mo-5yr old and pregnant/lactating women
- 13.6% urban vs. 16.9% rural
- 5.5% in wealthy vs. 22.4% in poor households

Source: DOST-FNRI Expanded National Nutrition Survey 2019
Complementary solutions

Supplementation
(Garantisadong Pambata, breastfeeding)

Diversified diet
(community and school gardens)

Food fortification
(Iron-fortified rice, Sangkap Pinoy)

Biofortification
(Golden Rice)

Source: HarvestPlus
How is Golden Rice different from ordinary rice?

- Golden Rice is not very different from its conventional counterpart. It is expected to cost the same; its beta carotene content is what makes it unique.

- Golden Rice is not expected to require any changes in farm managements or cultivation practices.

- As an inbred variety, GR seeds can be saved for the next planting season.
What does it taste like?

- Golden Rice tastes like ordinary rice.
- Beta-carotene does not affect the taste, aroma, and texture of rice.
When and where can I buy Golden Rice?

- As of this time, we are multiplying the seeds following the issuance of a commercial propagation permit.

- Initial deployment of Golden Rice is being carried out this year’s wet season planting in priority areas.

- Deployment sites will be increased as soon as more supply of seeds becomes available.
Goal: Improved food and nutrition security by 2027

**OVI 1:** 10% share of GR in the total *palay* production in the Philippines, which can meet the rice requirement of 100% of HH at risk of VAD

**OVI 2:** <15% VAD prevalence in the target areas

**Outcome/Purpose:** Ensured availability of GR in the market

**OVI:** 100% of the rice requirement of HH at risk for VAD made available in the market

**Output 1:** Increased adoption of GR seeds

**OVI:** 500K ha planted with GR

**Output 1.1:** Seed production

**OVI:** 20M kg of seeds produced and distributed to farmers

**Output 2:** Increased acceptability of GR

**OVI:** 100% of the target households at risk of VAD have consumed GR

**Output 2.1:** Social marketing

**OVI:** 1 set of IEC materials and marketing collaterals; product branding and market positioning conducted

**Output 3:** Created enabling environment

**OVI:** 100% of the target areas have passed an ordinance/resolutions supporting GR

**Output 3.1:** Policy advocacy

**OVI:** 10 Policy outreach activities conducted in all target areas
Golden Rice Multi-year Deployment Timeline

2021
- Approval of the biosafety permit for commercial propagation
- Seed Increase

2022
- Expansion of production:
  - Seeds: 24.4ha
  - Palay: 15.4ha
- Household: 200
- Increased knowledge, acceptability, and consumption among target households
- Secured policy support from national and local organizations

2023
- Expansion of production:
  - Seeds: 1,480ha
  - Palay: 54,137ha
- Household: 236,234
- Increased knowledge, acceptability, and consumption among target households
- Secured policy support from national and local organizations

2024
- Expansion of production:
  - Seeds: 2,317ha
  - Palay: 149,625ha
- Household: 652,909
- Increased knowledge, acceptability, and consumption among target households
- Secured policy support from national and local organizations

2025
- Expansion of production:
  - Seeds: 3,470ha
  - Palay: 249,550ha
- Household: 1,088,945
- Increased knowledge, acceptability, and consumption among target households
- Secured policy support from national and local organizations

2026
- Expansion of production:
  - Seeds: 4,915ha
  - Palay: 349,303ha
- Household: 1,524,231
- Increased knowledge, acceptability, and consumption among target households
- Secured policy support from national and local organizations

2027
- Expansion of production:
  - Seeds: 2,851ha
  - Palay: 499,004ha
- Household: 2,177,472
- Increased knowledge, acceptability, and consumption among target households
- Secured policy support from national and local organizations
GUIDING PRINCIPLES:
1. Humanitarian purpose
2. Scientific Integrity & Transparency
3. Partnership and shared responsibility with national and local agencies and orgs
4. Integration of GR in existing agri-nutrition programs
5. Prioritization of LGUs and populations at risk of VAD

Golden Rice Deployment Paradigm

Availability, affordability, and accessibility of safe and nutritious rice for all Filipinos at all times

DA Vision

Increased availability

Bringing Golden Rice to Filipino Farmers & Consumers

Increased knowledge, acceptability, & consumption

Improved policy + enabling environment
GR Deployment Pathways

MARKET-DRIVEN APPROACH
- Value chain analysis
- Commercialization with market players
- Consumer acceptability
- Marketing and promotion
- Product/recipe development

PROGRAM-BASED APPROACH
- Integration of GR into existing agri-nutrition programs
- Partnership
- Policy advocacy
2022 Pilot-Scale Deployment and Seed Production Areas

- **DEPLOYMENT SITES:** 10 regions; 17 provinces, 29 municipalities with 5 DA-REC partners and 19 seed grower- and 14 farmer- cooperators
- **TOTAL WET SEASON PROD’N AREA:** 38.45 hectares – 23.1 ha for seed production, 15.35 ha for commercial production
- **CROP STATUS:**
  - Most of the crops are in reproductive stage for Rc 682GR2E (35.45ha); Maximum tillering for Rc 238GR (3ha; unregistered)
  - **Expected harvest:** Last week of September to third week of November (Rc 682GR2E)
First harvest of Golden Rice (Malusog 1) this 2022 wet season

Our farmer-cooperator in Maguindanao harvested 7.8 tons/ha (dry at 11.8% MC)
Communication toolkits
Summary

- Golden Rice is as safe as ordinary rice with the added benefit of beta carotene in the grains.
- Golden Rice will complement existing nutrition interventions to improve the diets of Filipinos.
- Nuanced deployment approach! Deployment sites will be increased as soon as more supply of seeds and grains becomes available.
For more information about the Golden Rice Program, please contact:

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