Use of Stress-Tolerant Rice Varieties

The Philippines has a wide range of rice varieties developed to address the impacts of climate change. These include submergence-tolerant, drought-tolerant and early-maturing varieties. One of the early-maturing rice varieties is PSB Rc10 (Pagsanjan), which yields an average of 4.8MT per hectare. Farmers prefer to use this variety to shorten the planting season in periods of high flood risk. PSB Rc10 can be harvested as early as 106 days after seeding. It also has a good milling recovery of 66.62%.

The other variety that can withstand flooding is PSB Rc18 (Ala). It can survive complete submergence for 5-7 days and can be harvested 123 days after seeding. This long grain variety serves as a basin for several river systems of the province. Farmers in Naujan, Oriental Mindoro adapt to impacts of climate change by exploring rice varieties that can withstand harsh environmental conditions without compromising productivity. The use of stress-tolerant varieties reduces the risk of production losses during flooding events.

Use of Stress-Tolerant Rice Varieties

Can replace: Traditional Rice Varieties (high-yielding varieties)

Uses: Early-maturing rice variety: PSB Rc10 (Pagsanjan) Submergence-tolerant rice variety: PSB Rc18 (Ala)

Available Technical Briefs

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- Cordillera Administrative Region (CAR)
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  - Climate-Smart Pollocko in Benguet
- Region I - Ilocos Region
  - Mango Production in Ilocos
  - Rice-Corn Crop Rotation in Ilocos
  - Rice-Tomato Rotation in Ilocos
- Region II - Cagayan Valley
  - Rice-Mungbean Crop Rotation/Commercialization in Isabela
  - Climate Smart Rice in Isabela
- Region III - Central Luzon
  - Water Conservation Technology (WANT) in Tarlac
  - Climate-Smart Rice in Tarlac
  - Crop Rotation Zero Tillage Combination in Tarlac

**VISayas**
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  - Cropping Impounding Projects for High Value Crops in Balog
- Negros Island Region (NIR)
  - Use of Submergence-Tolerant Rice Varieties in Negros Occidental
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  - Crop Rotation with Integrated Nutrient Management in Davao
  - Carabao-Coconut Intercropping in Davao

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About the Authors

This technical brief was produced through the UPLB-CIAT-DA partnership under DA-BAR project titled "Climate Resilient Agriculture (CRA) Assessment, Targeting & Prioritization for the Adaptation and Mitigation Initiative in Agriculture (MIAA) - Phase 2 in Oriental Mindoro Province (MIMAROPA Region)." UPLB team
- Ms. Elizabeth Supangco, Project Leader
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Farmers in Naujan, Oriental Mindoro adapt to impacts of climate change by exploring rice varieties that can withstand harsh environmental conditions without compromising productivity. The use of stress-tolerant varieties reduces the risk of production losses of standing crops during flooding events.

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TECHNICAL BRIEF on Climate-Resilient Agriculture (CRA)

MIMAROPA (Region IV-B)

**TECHNICAL BRIEF on Climate-Resilient Agriculture (CRA)**

**MIMAROPA (Region IV-B)**

Farmers in Naujan, Oriental Mindoro adapt to impacts of climate change by exploring rice varieties that can withstand harsh environmental conditions without compromising productivity. The use of stress-tolerant varieties reduces the risk of production losses of standing crops during flooding events.

**Productivity**

Can reduce risk of production losses during flooding

**Adaptation**

Can survive 5-7 days in complete submergence
**Cost & Benefit**

- **Initial Investment / ha**: PhP 24,000
- **Cost of Adopting CRA**:
  - **Initial Investment**: PhP 24,000
  - **Labor & Services**: PhP 10,500
  - **Inputs**: PhP 13,500
- **Payback Period**: 2 years
- **Estimated Additional Annual Profit / ha**: PhP 7,750 (USD 151)
- **Net Present Value**: PhP 45,983 (USD 896)
- **IRR**: 75%
- **Current Adoption Rate**: 1%
- **Projected Adoption Rate**: 100%
- **Total Area Planted (ha)**: 30,136 ha
- **Aggregate Impact**: PhP 792 million
- **Period of Analysis**: 10 years
- **Discount Rate**: 8.5%
- **Exchange Rate**: 51.32 PhP = $1
- **Externalities**
  
  Further research is needed to quantify the externalities.

**Yield & Prices**

- **Without CRA**:
  - Average annual farm yield: 3,254 kg/ha
  - Price: PhP 16.05/kg
- **Traditional Rice**:
  - Average annual farm yield: 3,254 kg/ha
  - Price: PhP 16.05/kg
- **With CRA**:
  - Average annual farm yield: 4,426 kg/ha
  - Price: PhP 16.88/kg

**Sensitivity Analysis**

The CRA practice will still be more profitable than non-CRA practice even when:
- Yield of rice decreases by 10%

**Reasons to Invest**

1. Lower risk of production losses
2. Harvest in a short period of time
3. Withstand complete flood submergence
4. Higher potential farm income

**Recommendations**

- **Use in flood-prone areas during rainy season**.
  Use of stress-tolerant varieties is an effective strategy in farm areas experiencing flooding during the rainy season.
- **Inform farmers of available rice varieties**.
  LGUs could strengthen information dissemination campaigns to inform farmers of available rice varieties that can adapt to climate risks in the locality.
- **Stakeholders such as LGUs, DA RFO and NGOs can invest in further developing CRA practices to support local farmers**.

**Study Site**

**Oriental Mindoro**

- **Municipality of Naujan**

**Data Gathering**

1. Analysis of experiences of 51 farmers in three barangays in the municipality of Naujan in Oriental Mindoro province
2. Conduct of Experts’ Workshop with experts from the academe (University of the Philippines Los Baños) and the government (Municipal Agriculture Officers and Department of Agriculture Region 4B) pooling knowledge and insights on priority commodities and emerging climate resilient farm practices in the province
3. Review and synthesis of secondary information

**The CIAT CBA Methodology**

Cost-Benefit Analysis (CBA) is used to determine the relative profitability of alternative cropping practices, involving the comparison of the annual flows of incremental benefits with that of incremental costs. The CIAT CBA Online Tool analyzes the full benefits and costs of identified practices and adoption response at both individual farmer level and at aggregate level for a particular area.

Specifically, the tool can:

1. Quantify economic and some environmental trade-offs of adopting CRA practices.
2. Provide sensitivity analysis
3. Estimate the level of peak adoption

*http://cbatool.ciat.cgiar.org/*