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Effectiveness of Internal Seed Quality Control Training Program on Selected PhilRice Branch and Satellite Stations: A Comprehensive Analysis

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Abstract**—** *This descriptive mixed-methods study surveys how the Philippine Rice Research Institute's (PhilRice) internal seed quality control has been enhanced by training activities. PhilRice, which focuses on generating durable and high-yielding rice varieties through exhaustive research and development, is essential to the Philippines' agricultural industry. However, problems with seed production, like low germination rates and varietal impurity, present stern difficulties to crop yields and agricultural productivity in general. The study evaluates how PhilRice's training initiatives have upgraded the expertise, abilities, and procedures of employees engaged in seed production, particularly in conserving seed quality from fieldwork to packaging. The finding reveals that the training program has enhanced seed quality control procedures, which has improved varietal purity and germination rates. However, problems like lack of resources and cultural obstacles still exist, indicating areas that require more focus. Although the training program is beneficial, the results suggest that it needs to be continuously improved for long-term success.*

Keywords**— Agricultural Productivity; High-Quality Seeds; Internal Seed Quality Control; Seed Production; Training.**

I. INTRODUCTION

The Philippine Rice Research Institute (PhilRice), established in 1985 under Executive Order No. 1061 by President Ferdinand Marcos, is a government-owned corporation initially under the Department of Agriculture (DA). Its administrative oversight was shifted to the Office of the President in 2002 under Executive Order No. 76 but was returned to the DA in 2003 by Executive Order No. 219 to align with the Hybrid Rice Program.

PhilRice research activities are geographically centered at its Central Experiment Station in Brgy. Maligaya, Science City of Muñoz, Nueva Ecija. Complementing this main facility, are the seven branch stations strategically located nationwide. These include PhilRice Batac in Ilocos Norte, PhilRice Isabela in Isabela, PhilRice Los Baños in Laguna, PhilRice Agusan in Agusan del Norte, PhilRice Midsayap in North Cotabato, PhilRice Negros in Negros Occidental, and PhilRice Bicol in Bicol.

In 2013, a significant development for PhilRice was the approval of its Rationalization Plan (RP) in line with Executive Order (EO) No. 366 and its Implementing Rules and Regulations, along with Memorandum Order (MO) No. 190, s. 2005. This approval led to the establishment of the satellite stations in Central Mindanao University (CMU) under PhilRice Agusan, Zamboanga and USM under PhilRice Midsayap, and Mindoro under PhilRice Los Baños, expanding the institute's reach and capabilities.

PhilRice is mandated to develop high-yielding and cost-reducing technologies so farmers can produce enough rice for all Filipinos. Under the Republic Act No. 7308, also

known as "The Seed Industry Development Act of 1992", PhilRice's mandate on research and development particularly in breeding programs to develop high-yielding, pest-resistant, and climate-resilient rice varieties. Additionally, PhilRice is responsible for producing high-quality inbred seeds and hybrid parental lines. This work involves collaboration between the central experiment station and all branch stations, each of which is tasked with ensuring the best quality seeds in their area.

The Philippine rice sector faces significant challenges related to seed production, including low production volume, an increased occurrence of off-type seeds, and a low percentage of germination. These issues hinder the availability of quality seeds for farmers, leading to reduced planting areas and lower crop yields. The presence of off-type seeds, which deviate from desired characteristics, compromises varietal purity and uniformity, resulting in inconsistent crop performance and economic losses for farmers. Moreover, low germination rates indicate poor seed viability, leading to uneven crop emergence and reduced yield potential.

To improve seed quality control, it's important to train staff involved in seed production. The main goal of this training is to ensure high-quality inbred seeds are produced efficiently and made available on time.

This study describes, assesses, and analyzes the impact of training and improving practices and operations to strengthen internal seed quality control at selected PhilRice Branch and Satellite Stations. Specifically, it aimed to describe the participants' profile and seed production situation before the training through SWOT analysis, the improvement of the seed production through training, the effectiveness of the training program, and the evaluation of the challenges of the training program.

II. METHODOLOGY

A descriptive, mixed-method research design was employed to evaluate the impact of PhilRice's internal seed quality control training. Quantitative data was collected via surveys from participants at PhilRice's branch and satellite stations, assessing demographics. Qualitative data was gathered through interviews with the training team to explore experiences, strengths, weaknesses, and suggestions for improvement.

The study was conducted at PhilRice's Central Experiment Station in Nueva Ecija and its branch stations across the Philippines, including Batac, Isabela, Los Baños, Agusan, Midsayap, Negros, and Bicol. Satellite stations in Bukidnon, Zamboanga, the University of Southern Mindanao, and Mindoro were also included to represent diverse agro-ecological zones.

Participants included PhilRice personnel involved in seed quality control and those who participated in internal training programs. Through stratified random sampling, the study ensured that there was a representative per group, this comprised the Internal Seed Quality Control Team and staff trained at various PhilRice stations in 2023.

Distribution of Participants

Table 1. Distribution of Participants, n=50

PhilRice Branch/Satellite Stations	No. of Training Participants	No. of Participants
PhilRice Negros	13	3
PhilRice Agusan	16	4
PhilRice CMU	14	4
PhilRice Midsayap/USM/Zamboanga	16	4
PhilRice Bicol/Samar	16	4
PhilRice Isabela	19	5
PhilRice Los Baños/Mindoro	19	5
PhilRice Batac	15	4
Central Experiment Station	68	17
TOTAL	**196**	**50**
Internal Seed Quality Control Training Team		**No. of Participants**
12		**7**

III. RESULTS AND DISCUSSION

3.1. Profile of the Participants

Training Participants

Table 2. Participants' Profile (Training Participants)

Participants' Profile		Frequency	Percentage
Age	21-30	35	70%
	31-40	12	24%
	41-50	3	6%
Total		***50***	***100%***
Gender	Male	38	76%
	Female	12	24%
Total		***50***	***100%***
Educational Background	High School Graduate	27	54%
	College Graduate	23	46%
Total		***50***	***100%***
Position/Job Role	Researcher	23	46%
	Field Worker	27	54%
Total		***50***	***100%***
No. of Years in PhilRice	Less than 1 year	2	4%
	1-5 years	32	64%
	6-10 years	13	26%
	11-15 years	3	6%
Total		***50***	***100%***
Language	Tagalog	5	10%
	Tagalog/English	19	38%
	Bisaya	3	6%
	Bisaya/English	8	16%
	Tagalog/Bisaya	15	30%
Total		***50***	***100%***

The participants' profile shows that they are mostly young, with 70% aged between 21 and 30, and the majority being male (76%), highlighting a noticeable gender imbalance. With regards to education, 54% have a high school diploma, while 46% have college degrees. The participants are divided between field workers, 54%, and researchers, 46%. Most of them (64%) have been with PhilRice for 1 - 5 years, indicating that many are relatively new to the organization, with only a small number having over 10 years of experience. Language diversity is also evident with 38%

speaking both Tagalog and English and 30% using a mix of Tagalog and Bisaya dialect, which could cause some communication challenges during the training.

Training Team

Table 3. Participants' Profile (Training Team)

Participants' Profile		Frequency	Percentage
Age	21-30	4	57.14%
	31-40	1	14.29%
	41-50	1	14.29%
	61 and above	1	14.29%
Total		***7***	***100%***
Gender	Male	3	42.86%
	Female	4	57.14%
Total		***7***	**100%**
Educational Background	College Graduate	5	71.43%
	Master's Degree	2	28.57%
Total		***7***	***100%***
Position/Job Role	Researcher	7	100%
	Field Worker	0	0%
Total		***7***	***100%***
No. of Years in PhilRice	Less than 1 year	2	28.57%
	1-5 years	3	42.86%
	16-20 years	1	14.29%
	20 years and above	1	14.29%
Total		***7***	***100%***
Language	Tagalog/English	6	85.71%
	Bisaya/English	1	14.29%
Total		***7***	***100%***

The results show that 57% are female, which suggests the team has a strong academic background, with 71.43% holding college degrees and 28.57% holding master's degrees. Every member of the team is participating in research, demonstrating a strong emphasis on this field of study. With regards to experience, 42.86% have 1 to 5 years in the field, while the remaining participants either bring new perspectives as newcomers or contribute with long-standing expertise. The combination of experience levels results in a well-rounded and capable workforce.

3.2. Situation of Seed Production Before the Training

Strengths	***Weaknesses***
Efficient Seed Production Processes in some areas: Most participants agreed that the seed production processes	**Inconsistent Seed Quality**: Participants indicated that the quality of seeds produced was inconsistent and variable.

were efficient. This indicates that participants generally perceive that the methods and workflows used in seed production were effective and productive. However, the presence of some disagreement suggests that there may be room for improvement or varying opinions on certain aspects of efficiency. **Effective Use of Advanced Technologies**: Most participants agreed that advanced technologies were effectively utilized in seed production. This indicates that there is recognition of the benefits of modern technologies in enhancing productivity and quality in seed production processes. The disagreement from some participants might stem from varying experiences with technology implementation or perceived effectiveness.	This points to issues in maintaining uniformity and reliability in seed output, which is critical for meeting market demands and ensuring customer satisfaction. **Lack of Training and Development**: Participants noted a lack of training and development opportunities for personnel involved in seed production. This weakness highlights potential gaps in skill development, which can affect the team's ability to adopt new techniques, improve processes, and enhance overall productivity. **Reliance on Outdated Methods**: There was recognition that seed production relied on outdated methods and practices. This suggests a need for modernization and adoption of advanced technologies to improve efficiency, reduce costs, and enhance the quality of seeds produced.

Opportunities	***Threats***
Expanding into New Markets: Participants recognized significant potential for expanding into new markets. This suggests that there are untapped opportunities to introduce seeds to new regions or customer segments, potentially increasing market share and revenue streams. **Adopting New Technologies:** There were opportunities identified to adopt new technologies to improve seed production. This indicates potential benefits in leveraging modern innovations to enhance efficiency, quality, and sustainability in seed production processes. **Collaboration with other Research Institutions:** Participants noted opportunities for collaboration with research institutions to enhance seed production. This suggests potential partnerships that could lead to advancements in breeding techniques, disease resistance, and overall seed quality improvement.	**Competitive Pressure from Other Seed Producers:** Participants acknowledged significant competitive pressure from other seed producers. This suggests a competitive landscape where other companies are vying for market share, potentially impacting pricing, innovation, and market positioning for seeds. **Environmental Factors as a Threat:** Environmental factors were perceived as posing a significant threat to seed production. This could include issues such as climate change, weather variability, pests, and diseases that can affect crop yields and seed quality, thereby impacting production outcomes. **Economic Instability Impacting Production:** Economic instability was noted to negatively affect seed production. This suggests vulnerabilities to factors such as inflation, currency fluctuations, market volatility, and economic downturns that can impact investment, costs, and profitability in seed production.

Table 4. SWOT Analysis

3.3. Training on Seed Production

Low Production Volume

In agriculture, increasing production volume requires technology integration and focused training. By teaching the best practices for handling, storing, and distributing seeds, seed management training improves production cycles. These initiatives aim to empower farmers with the necessary skills (Fronda, 2023). Automated equipment and

digital monitoring systems are examples of modern technology that increases operating efficiency, reduces personnel costs, and guarantees consistent yields and quality. Crop health is improved and resource utilization is maximized when staff members are properly trained in the use of inputs like fertilizers and irrigation. Training on efficient scheduling and planning, which takes into account resource availability and seasonal demand, also improves workflows and decreases downtime, which boosts output even more.

High Occurrence of Off-Types

Stricter standards, enhanced quality inspections, and focused training are all necessary to lower the high frequency of off-types in seed production. Maintaining genetic purity is aided by training staff to recognize and quickly eliminate off-types. Strict criteria for genetic integrity, frequent quality inspections, and improved auditing techniques all help to prevent off-type contamination by spotting problems early. Proper harvesting techniques, which are reinforced by training, guarantee that seeds stay uncontaminated, and continuing education keeps staff members abreast of industry best practices. By successfully reducing off-types, this all-encompassing method to training and quality control guarantees consistently high-quality seed batches.

Low Percentage of Germination

Comprehensive training and quality control throughout planting, treatment, and storage procedures are necessary to increase germination rates in seed production. Employee education on the best ways to store seeds—temperature, humidity, and ventilation—maintains seed viability and promotes more germination. Training helps break dormancy and promote consistent seedling emergence by introducing pre-sowing treatments including scarification and priming. Applying fertilizer and insecticides correctly is also essential; instruction on time and amount protects seeds without compromising their ability to germinate. Only seeds with a high germination capacity are delivered to farmers thanks to improved seed quality testing. To maximize seed performance in the field, staff training on optimal planting conditions—soil preparation, depth, and moisture—promotes quicker, consistent germination.

IV. EFFECTIVENESS OF THE TRAINING PROGRAM

The training program received favorable reviews from the participants. Participants' technical proficiency and decision-making improved as a result of acquiring new information and abilities. Their learning experience was improved because they were supported by the teachers, understood the training objectives, and valued real-world examples. They reported advances in tactics and procedures as a result of their successful application of the knowledge to their farming activities. To maintain consistency in their farming operations, participants followed the principles and the criteria that were taught. Furthermore, the training enabled them to resolve issues about the farm, indicating its usefulness in tackling and identifying agricultural problems and difficulties (Mina, Subia & Ermita, 2020).

V. CHALLENGES OF THE TRAINING PROGRAM

The main challenges encountered in the training program are the following (Abelardo, et al., 2019):

1. Maintaining participant engagement was challenging due to lengthy discussions and frequent distractions.

2. Limited resources, like inconsistent access to a projector and the need for an indoor venue, affected presentation quality due to sunlight interference.

3. Cultural and language differences among participants, such as varying dialects, and complicated communication and understanding, making it harder to deliver technical content effectively.

REFERENCES

[1] Abelardo, L. & Lomboy, M. & Lopez, C. & Balaria, F. & Subia, G. (2019). Challenges Encountered by the National High School Teachers in Doing Action Research. International Journal of English Literature and Social Sciences. 4. 1046-1051. 10.22161/ijels.4418.

[2] About PhilRice - Philippine Rice Research Institute. (2024, May 3). Philippine Rice Research Institute. https://www.philrice.gov.ph/about-us/philrice/

[3] Alston, J. M., et al. (2016). "The Impact of Economic Regulation and Research on Agricultural Productivity." Handbook of Agricultural Economics, 5, 672-735.

[4] AmberChan. (n.d.). RA 7308 Hand Out. Scribd. https://www.scribd.com/document/377862328/RA-7308-Hand-Out

[5] Bordey, F. H. (2016). Competitiveness of Philippine Rice in Asia. http://books.google.ie/books?id=R-GAQAACAAJ&dq=file:///D:/Admin/Downloads/Philippine Rice-Research-Institute-Executive-Summary-2016.pdf&hl=&cd=1&source=gbs_api

[6] Dias, L., et al. (2021). "Seed Production and Quality in Agriculture." Journal of Crop Improvement, 35(1), 1-18.

[7] Fronda, J. G. (2024). Empowering Nueva Ecija's Farmers through Microfinancing: A Blueprint for Enhancing Financial Literacy and Agricultural Resilience. International Journal of Economics and Financial Issues, 14(4), 123–130. https://doi.org/10.32479/ijefi.16330

[8] Gorji, M., et al. (2020). "Market Expansion Strategies in the

Seed Production Sector." Agricultural Economics, 46(3), 321-335.
[9] Klein, A. M., et al. (2018). "Collaborations with Research Institutions in Seed Production." Annual Review of Entomology, 63, 1-22.
[10] Kumar, P., et al. (2017). "Outdated Methods and Productivity in Seed Production." International Journal of Agricultural Management, 6(2), 89-102.
[11] Kumar, S., et al. (2020). Role of modern technologies in enhancing seed production efficiency: A review. Agricultural Research Reviews, 15(2), 123-135.
[12] Li, Y., et al. (2018). Quality management practices in seed production: A systematic review. Seed Science Research, 28(1), 1-15.
[13] Mina JC, Subia GS, Ermita PP (2020) Value chain analysis of slipper industry in the footwear capital of the north. Int J Supply Chain Manag 9(5):178–183
[14] Nelson, R., et al. (2017). "Strategic Investments in Seed Production Technology." Journal of Economic Perspectives, 31(1), 159-182.
[15] PhilRice History - Philippine Rice Research Institute. (2022, February 15). Philippine Rice Research Institute. https://www.philrice.gov.ph/about-us/history/
[16] Sharma, P., et al. (2017). Agronomic practices influencing seed germination and crop productivity: A comprehensive review. Crop Science, 57(4), 1820-1836.
[17] Singh, A., et al. (2019). Impact of training on the efficiency of seed production in agriculture. Journal of Agricultural Education and Extension, 25(3), 245-259.
[18] Smith, J., et al. (2019). "Communication Issues in Seed Production Networks." Journal of Agricultural Communications, 45(3), 321-335.
[19] World Bank. (2020). "Economic Instability and Seed Production." World Bank Group.