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Quality of rice seed production in Occidental Mindoro

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Abstract

This study investigated the Quality of Rice Seed Production in Occidental Mindoro. Using qualitative and quantitative methods, this paper further discussed the problems encountered by seed producers, such as seed selection, finances, and pests. The data were collected from 15 individual seed producers of Occidental Mindoro and 41 members of the Seed Producers Cooperative of Occidental Mindoro, who underwent thematic and statistical analyses. Two variables representing the problems encountered by seed producers registered significant to highly significant connections to the quality of seed production. Beta coefficients of 0.240 and 0.547 indicate a low to moderate and positive relationship between the variables mentioned. The p-values of 0.033 and <0.000 are far less than the 0.05 alpha level. Hence, these suggest a significant relationship between seed selection, pests, and production quality. Finances failed to influence the level of seed production quality. The quantitative data collected from the respondents were generated by WarpPLS version 7.0. The problems encountered: seed selection, finances, pests, and the quality of seed production in Occidental Mindoro were interpreted as high extent. The researcher highly advocates for seed producers to engage in more extensive training programs and workshops. These initiatives are crucial for expanding their understanding of different seed varieties and effective strategies. Furthermore, it is recommended that future researchers delve deeper into additional factors influencing the management of seed production quality in Occidental Mindoro.

Keywords: quality of seed production, problems encountered, finances, seed selection, pests

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1. Introduction

Rice is the primary food crop of Asia, but it is also becoming popular on other continents due to increasing urbanization, ease of cooking, and human migration. Rice area, production, and productivity have risen continuously since the mid-1960s with the development of semi-dwarf varieties. Its higher yield, better profitability, wide adaptation, and international collaboration have helped to reduce hunger. The global population has now crossed 7 billion in 2011, and there is a need to produce more rice for the growing population (Singh, 2018). The Philippines is a large rice consumer with a population of around 110 million and an annual per capita rice consumption of 133 kg. Every meal is usually rice, accounting for most of the average Filipino's caloric consumption. In Filipino households, rice is more than just a source of sustenance; it holds cultural and social significance in Filipino society. Traditional Filipino meals often revolve around a communal dining experience, where family and friends gather around a table to share rice-based dishes. This practice fosters a strong sense of community and reinforces familial bonds, encouraging open communication and a feeling of belonging (USDA, 2021).

To fully appreciate the exceptional quality of rice served in Filipino households, one must prioritize the excellence of the rice seeds used in cultivation. The foundation of a delectable rice dish hinges upon the quality of the seeds from which they sprout. Seeds serve as the fundamental building blocks of any thriving rice crop. They must undergo meticulous cultivation, careful harvesting, and precise processing to achieve optimal yields and ensure top-notch results. In agriculture, seed is essential for increasing crop productivity and food security. It can also contribute to farmers' livelihoods by raising their income and yield. However, the nation's food supply is in jeopardy due to the quick advent of climate change and the sluggish pace of economic development. Therefore, efficient and innovative agricultural solutions are essential for the seed sector to ensure food security (Estrella, 2022).

The Philippines remains one of the world's top rice producers, holding the 8th position alongside countries such as China, Indonesia, India, and other Southeast Asian nations. To maintain and further enhance this position, ongoing rice research is conducted at various institutes and universities nationwide. These research efforts encompass a range of areas, from developing new rice varieties to improving the maturation process of rice crops in response to climate change impacts (DA Press Office, 2022). While there's plenty of research on growing rice and other crops like onions, very little attention has been given to studying seed production. Understanding the problems seed producers face can help not only researchers but also open up opportunities to improve the quality of the rice seeds they produce. By examining the “ins and outs” of seed production, researchers can discover innovative solutions that have the potential to raise the overall standards of rice seed production, benefiting the economic and farming community. This research aimed to know the key problems seed producers face, focusing on understanding the factors impacting the seed quality of seed production processes in Occidental Mindoro.

Statement of the Problem - The study identified the problems encountered by the seed producers and determined the quality of seed production in Occidental Mindoro. Specifically, it sought to answer the following questions. (1) What are the problems encountered by seed producers in Occidental Mindoro? (2) What is the extent of problems encountered by seed producers in Occidental Mindoro in terms of seed selection finances and pests? (3) What is the extent of quality of seed production in Occidental Mindoro? (4) Is there a significant relationship between the problems encountered and the quality of seed production in Occidental Mindoro? (5) Based on the results of the study, what plan of action can be developed to improve the experiences and strategies of the seed producers in Occidental Mindoro?

Significance of the Study - This study proved significant for the following: To the consumers, it will enable them to gain knowledge about the strategic management of seed producers to meet the standard quality of rice seed production in Occidental Mindoro. To the seed producers, this study is specifically designed to benefit them. It aims to provide valuable insights into the common challenges they face and enable them to distinguish variations in seed quality resulting from their practices. With this knowledge, they can enhance their businesses and devise practical solutions to strengthen their entrepreneurial endeavors. This study will enable the farmers to understand the prevailing issues affecting their seeds comprehensively. By doing so, they can make informed decisions when selecting the most suitable seed varieties for their specific farming needs. This study will provide the students with valuable insights by enhancing their understanding of the intricate processes involved in seed production. Delving into the intricacies of seed production will empower them with in-depth knowledge that can be applied in various contexts, from agriculture to conservation efforts. To the government and other Agencies, this study will facilitate an understanding of the challenges faced by our seed producers, empowering stakeholders to develop programs that mutually benefit seed producers and farmers alike. This will serve as a guide or reference for future researchers with similar studies.

Scope and Delimitation of the Study - This study focused on identifying the key problems of the seed producers and the factors influencing the quality of their seeds. It is limited to individual seed producers and members of the Seed Producers Cooperative of Occidental Mindoro (SEPCOM) located in Occidental Mindoro. To identify the problems encountered in terms of seed selection, finances, and pests by seed producers and the extent of seed production quality in Occidental Mindoro, the interview guide was used for the qualitative phase, and the survey questionnaire was used for the quantitative method. This study was conducted during the fiscal year 2023-2024.

2. Methodology

Research Design - In this study, mixed sequential exploratory research design was used. In this design, qualitative data collection and analysis occur initially, followed by quantitative data collection and analysis. This approach allows for exploring initial questions and forming hypotheses. Subsequently, quantitative data can be utilized to test or validate qualitative findings (Fetters et al., 2013). Using both forms of data enables flexibility, adjusts to discoveries, produces better proof, and results in a deeper comprehension of the study.

Respondents of the Study - The study's respondents were purposively selected from fifteen (15) individual seed producers of Occidental Mindoro for qualitative data collection. With purposive sampling, the researcher uses the knowledge to choose a sample that would be helpful to the research objective, and the inclusion criteria are seed producers located outside San Jose, Occidental Mindoro; an individual seed producer for exclusion criteria is a seed producer affiliated with a cooperative. Moreover, in the quantitative method, forty-one (41) members of the Seed Producers Cooperative of Occidental Mindoro (SEPCOM) located in Occidental Mindoro were randomly selected out of 45 population. The Bureau of Plant Industry, a government agency overseeing agricultural matters, provided a list of seed producers outside the San Jose area. This list of seed producers was used to determine the respondents for the qualitative data collection and reliability test. The researcher also communicated with the Seed Producers Cooperative of Occidental Mindoro to determine the number of their members and calculate the respondents needed for the quantitative data collection. To determine the sample size of the teacher-respondents, Raosoft’s sample size Calculation Formula was used and anchored at a 5% margin of error

Research Instrument - In this study, the researcher used a structured interview guide in collecting the qualitative data. Moreover, the primary instrument used for data collection was based on the information gathered from the qualitative data collection using the researcher-made instrument. There were two sections to the questionnaire. The first part aimed to identify the problems encountered by seed producers, while the second part focused on identifying the factors affecting the quality of seed production. The data collected were interpreted using the 5-point Likert scale, a widely used and versatile measurement tool for assessing opinions and perceptions. This scale provided respondents with a structured format to express their level of agreement or disagreement with

the questionnaire.

The expert validity of the instrument was established by seeking assistance from the faculty of Divine Word College of San Jose and Occidental Mindoro State College. All suggestions and recommendations were incorporated in revising the questionnaire for improvement. Twenty (20) respondents comprised the reliability group of seed producers outside of San Jose and Occidental Mindoro. Since the researcher would like to use 30 respondents for the reliability test per the statistician's suggestion, only a few seed producers are available in the area. They were asked to respond to the instrument in a questionnaire translated into the vocabulary for the facility of understanding. The instrument has four components: seed selection, finances, and pests, with 10 indicators each, and the extent of quality, with 20 indicators, was tested once for internal consistency. These 50 items have been tested for the inter-item reliability of the instrument using the split-half method. Since the instrument was administered once, a correction formula was applied using the Spearman-Brown coefficient measure of equal length. The result of the reliability analysis is shown below.

Table 1

Reliability Results of the Instruments

Components	Number of items	Reliability Coefficient*	Interpretation
Part I – Problems Encountered			
1. Seed Selection	10	0.892	High Reliability
2. Finances	10	0.928	Very High Reliability
3. Pests	10	0.819	High Reliability
Part II. Extent of Quality			
Quality of Seed Production	20	0.979	Very High Reliability

*Cronbach's Alpha based on standardized items

The reliability coefficients based on equal length registered generally high reliability or consistency of the items in the instrument and is therefore acceptable for administration to the final group of respondents who are seed producers.

Data Gathering Procedure - For the qualitative data, the researcher used structured interviews and gathered responses through personal interviews. The survey instrument was designed based on the responses collected during personal interviews for the quantitative data collection process. The researcher communicated face-to-face with the Seed Producers Cooperative of Occidental Mindoro to gather data from their members. Due to the hectic schedules of the members, various procedures were used in gathering data, such as personal collection and through Google Forms. After completion, the researcher gathered and submitted the data to the data analyst for statistical analysis and interpretation. The conclusions and recommendations of this study were provided to the individual seed producers and the cooperative to help address the problems encountered in producing better-quality seeds.

Statistical Treatment of the Data - The qualitative data generated through the researcher's interview underwent thematic analysis. Recording, transcription, tabulation, and coding were done to extract the themes. The initial and final thematic maps were illustrated to identify the final themes. The quantitative data collected from the respondents was classified, tabulated, and interpreted using the WarpPLS version 7.0

Ethical Considerations - Letters of intent, requests, and purposes were drafted and presented to the individual seed producers and the Seed Producers Cooperative of Occidental Mindoro. Once approved, the questionnaires underwent reliability and validity examinations. After validating and testing the instruments, the researcher administered the questionnaire to the cooperative members. The researcher sought permission and consent from the respondents, acknowledging their right to decline participation and ensuring voluntary participation. Confidentiality of respondent data was maintained throughout data collection, analysis, and findings, with assurance that all gathered data and results would be exclusively used for the study's purpose.

3. Results and Discussions

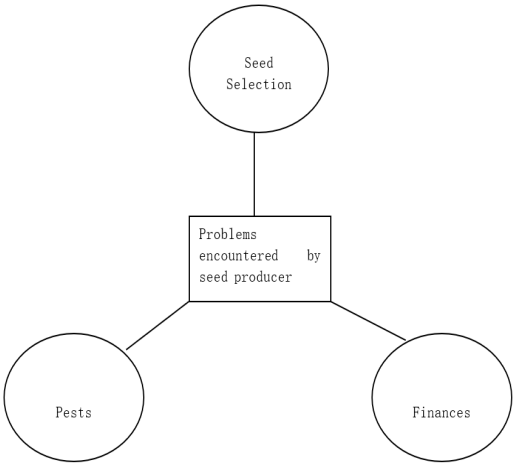

Figure 1. Problem Encountered by Seed Producers Final Thematic Map

The qualitative responses were analyzed using thematic analysis. This involved recording, transcribing, tabulating, and coding to extract the themes. The developing thematic map illustrates the sub-themes represented within rectangles. The main theme, "Problems encountered by seed producers," is described based on the statements provided by the participants. A total of twelve (12) problems encountered by seed producers were summarized in the thematic map. Five (5) descriptions are grouped under seed selection and finances, while two (2) descriptions are grouped under pests. The final themes are presented in circular figures in Figure 1, encompassing seed selection, finances, and pests. As mentioned by Louwaars & Manicad (2022), all farmers need good seeds for every planting season. Seed growers choose seeds based on their understanding of the variety's diversity and quality, as well as its suitability for cultivation and cultural significance. Farmers may obtain seeds from external sources, whether out of necessity or a desire to experiment.

Table 2

Mean Extent of Problems Encountered by Seed Producers in Terms of Seed Selection

Indicators	Weighted Mean	Verbal Description
1. I am knowledgeable about the various rice seed variants.	4.41	High Extent
2. I find it easy to assess the quality of rice seeds.	4.05	High Extent
3. I have sufficient information to select the appropriate rice seed.	4.17	High Extent
4. I face challenges in selecting the rice seeds.	3.61	High Extent
5. I have access to expert guidance on rice seed selection.	4.07	High Extent
6. Environmental factors influence my decision in choosing rice seeds.	4.32	High Extent
7. Reliability of the seed supplier is a factor in seed selection.	4.10	High Extent
8. I conduct regular monitoring of seeds to ensure their quality.	4.17	High Extent
9. I regularly monitor the seed selection process to ensure its efficacy.	4.46	High Extent
10. I regularly implement feedback to improve the process.	4.41	High Extent
Composite Mean	4.18	High Extent

Scale: 4.50-5.00- Very High Extent; 3.50-4.49-High Extent; 2.50-3.49- Moderate Extent; 1.50-2.49 –Low Extent; 1.00-1.49- Very Low Extent

Table 2 presents the mean extent of seed selection problems encountered by seed producers. Weighted means were used to describe the extent of problems encountered. Indicators include various statements related to the knowledge, ease of assessment, information availability, challenges faced, access to expert guidance, influence of environmental factors, reliability of seed suppliers, regular monitoring of seeds and selection process, and implementation of feedback for improvement. It reveals that problems encountered in seed

production in terms of seed selections were assessed by the respondents as "High Extent," with a composite mean of 4.18. This implies a sufficient level of understanding regarding seed selection; it also highlights opportunities for enhancing awareness about alternative seed varieties among farmers. The findings show that seed producers actively implement feedback to improve the selection process, indicating a proactive approach to addressing challenges and optimizing seed selection practices. Though seed producers have a high level of knowledge about various rice seed variants, they still face some challenges in the selection process, albeit to a lesser extent. Environmental factors also significantly influence seed producer's decision in choosing rice seeds, suggesting the importance of considering external conditions in the selection process. This aligns with how farmers, including seed producers, select seeds based on their knowledge and needs, sometimes accessing seeds from other sources to try new varieties. This illustrates the complex dynamics involved in seed selection and the continuous exploration and adaptation within seed systems, even among knowledgeable seed producers (Louwaars & Manicad, 2022). They also describe farmer seed systems as including selection based on various factors like variety understanding and desired traits.

Table 3

Mean Extent of Problems Encountered by Seed Producers in Terms of Finances

Indicators	Weighted Mean	Verbal Description
1. The rising costs of inputs (e.g., fertilizers, pesticides) impact our financial sustainability.	4.88	Very High Extent
2. Unpredictable market prices pose a significant financial challenge for our seed production.	4.93	Very High Extent
3. Government support is essential for addressing financial challenges.	4.41	High Extent
4. Investing in technologies is critical for the efficiency of seed production.	3.90	High Extent
5. Flood impacts the financial stability of seed production.	4.12	High Extent
6. Droughts impact the financial stability of our seed production.	4.44	High Extent
7. Access to training opportunities is crucial for our success.	4.27	High Extent
8. Better infrastructure support is needed to improve the overall financial efficiency.	4.15	High Extent
9. Access to market information is essential for addressing financial challenges in selling rice seeds.	4.34	High Extent
10. Secure land tenure is crucial for ensuring long-term financial stability in farming.	4.44	High Extent
Composite Mean	4.39	High Extent

Scale: 4.50-5.00- Very High Extent; 3.50-4.49-High Extent; 2.50-3.49- Moderate Extent; 1.50-2.49 –Low Extent; 1.00-1.49- Very Low Extent

The table presents the mean extent of problems seed producers encounter in terms of finances, along with corresponding weighted mean scores and interpretations. The indicators include various statements related to financial challenges faced by seed producers, such as rising input costs, market price unpredictability, government support, technology investment, environmental impacts (floods and droughts), access to training opportunities, infrastructure support, access to market information, and secure land tenure. Specifically, indicators 1 and 2 ("The rising costs of inputs impact our financial sustainability" and "Unpredictable market prices pose a significant financial challenge for our seed production") have the highest weighted mean scores of 4.88 and 4.93 respectively, indicating a high extent of agreement among seed producers regarding the financial impact of input costs and market price unpredictability. This proves the seed producers' agreement regarding the problems encountered in terms of the continuous increase in the prices of inputs used in seed production. The study by Schmidhuber & Qiao (2022) highlights the rising costs of agricultural inputs, including those used for seed production (e.g., fertilizers, energy). This aligns with the study's findings on how these rising costs can impact the financial sustainability of seed producers. Furthermore, the study by Assouto et al. (2020) discusses

the challenges farmers face in accessing markets, particularly in developing nations, particularly regarding finances. Moreover, the findings reveal that problems encountered in seed production in terms of finances were assessed by the respondents as "High Extent," with the composite mean being 4.39, meaning that prices in agriculture are prone to significant volatility. The timing of the harvest and the production choice are not in sync, which results in low price elasticity of demand and a lag in price risk (Assouto et al., 2020). The study by Sanchi et al. (2022) highlights the rising costs of agricultural inputs, including those used for seed production (e.g., fertilizers and energy). This aligns with the study's findings on how these rising costs can impact the financial sustainability of seed producers. PhilSEED (2023) also mentioned the challenges, such as the lack of knowledge among Philippine farmers on market trends, prices, and demand. Thus, those challenges can hinder seed producers' ability to sell their seeds at a fair price and affect their financial stability. This implies that seed producers may also need better access to training and information to make informed decisions that can improve their financial standing.

Table 4

Mean Extent of Problems Encountered by Seed Producers in Terms of Pests

Indicators	Weighted Mean	Verbal Description
1. Pests affect my seed production yield.	4.73	Very High Extent
2. I use effective strategies to control pest infestations.	4.15	High Extent
3. My seed production facilities have proper pest control measures.	4.15	High Extent
4. I train personnel in seed production with a focus on pest management.	4.12	High Extent
5. I regularly monitor and address pest-related issues promptly.	4.12	High Extent
6. I know that using pest-resistant seeds helps with pest issues during production.	4.00	High Extent
7. I work with agricultural experts to deal with pest challenges in seed production.	4.07	High Extent
8. I allocate enough money to control pests in seed production.	3.95	High Extent
9. Climate change is affecting pests in seed production.	4.54	Very High Extent
10. I, as a seed producer, communicate well with pest control experts to share information about emerging pest threats.	4.17	High Extent
Composite Mean	4.20	High Extent

Scale: 4.50-5.00- Very High Extent; 3.50-4.49-High Extent; 2.50-3.49- Moderate Extent; 1.50-2.49 –Low Extent; 1.00-1.49- Very Low Extent

Table 4 presents the mean extent of problems encountered by seed producers in terms of pests, along with corresponding weighted mean scores and interpretations. The indicators include statements about pest challenges and pest management practices in seed production. It reveals that the respondents assessed problems in seed production in terms of pests as "High Extent," with the composite mean being 4.20. These scores indicate a high extent of agreement across all indicators, suggesting that seed producers encounter significant challenges related to pests in their operations. Specifically, indicators 1 and 9, pests affect my seed production yield (4.73), and climate change is affecting pests in seed production (4.54), have the highest weighted mean scores among 10 indicators, indicating a very high extent of agreement among seed producers regarding the impact of pests on seed production yield and the influence of climate change on pest dynamics. This supports Yap's (2019) conclusion that effective pest management practices and adaptation strategies are important to mitigate the impact of pests on seed production. It has been observed that the correct application of organic farm input can help prevent or reduce damage to crops. According to Skendžić et al. (2021), pests are a significant biotic component also impacted by weather disruptions and climate change. An increase in temperature directly impacts the dynamics of pest populations, their ability to reproduce, survive, and spread, as well as their interactions with their natural enemies and the environment. Because of this, it's critical to keep an eye on the appearance and abundance of pests because their living conditions might shift quickly.

Table 5 presents the mean extent of the quality of seed production as perceived by seed producers. The indicators cover various aspects of seed production practices, including using vigor testing, field inspections, genetic purity measures, training practices, and documentation protocols. The composite mean of 4.14 shows a high extent in terms of the quality of seed production; it means that the Occidental Mindoro seed producers are maintaining a rigorous practice to produce palay seeds that will pass the quality inspection. Moreover, the finding indicates that seed producers in Occidental Mindoro are striving to maintain the quality of rice seeds despite facing challenges. It also indicates that ensuring the quality of seeds is a critical aspect of seed production, as it enhances the overall quality of the seeds produced. In the case of rice, seed quality assurance begins in the field and involves several crucial steps that seeds go through before reaching the customers (PhilRice, 2022). Indicators about monitoring and inspection further confirm the overall high extent of seed production quality as perceived by seed producers, reflecting their confidence in the effectiveness of their practices in maintaining and improving seed quality.

Table 5

Mean Extent of Quality of Seed Production

Indicators	Weighted Mean	Verbal Description
1. I use the vigor test to check seed quality.	4.07	High Extent
2. The vigor test helps me find seeds with good germination potential.	4.12	High Extent
3. I include vigor testing in my seed production practices.	4.10	High Extent
4. I train personnel in seed production on vigor testing.	4.00	High Extent
5. I improve seed production based on feedback from vigor test results.	4.22	High Extent
6. I transparently share information from vigor testing.	4.05	High Extent
7. The vigor test significantly improves my seed production quality.	4.10	High Extent
8. I regularly inspect fields.	4.29	High Extent
9. Inspections help me find issues in seed production.	4.29	High Extent
10. I follow a clear protocol for field inspection.	4.20	High Extent
11. I communicate openly with the seed production manager during inspections.	4.27	High Extent
12. I keep documentation for future reference.	3.93	High Extent
13. I consider all factors for quality seeds in my field inspections.	4.05	High Extent
14. I use feedback from inspections to make improvements.	4.27	High Extent
15. I take strict measures for genetic purity in seed production.	4.22	High Extent
16. Quality measures ensure genetic purity.	4.05	High Extent
17. Information about seed genetics is clear.		4.20
18. I regularly monitor seed genetics.	4.37	High Extent
19. I train personnel in seed production practices.	4.10	High Extent
20. I have a system for traceability in seed identification.	3.95	High Extent
Composite Mean	4.14	High Extent

Scale: 4.50-5.00- Very High Extent; 3.50-4.49-High Extent; 2.50-3.49- Moderate Extent; 1.50-2.49 –Low Extent; 1.00-1.49- Very Low Extent

Table 6

Path Coefficients and p-values for H0

Paths	Beta (β) Coefficients	p-values*	Interpretation
Seed→Quality	0.574	<0.001	Highly Significant
Finance→Quality	0.205	0.060	Not Significant
Pest→Quality	0.240	0.033	Significant

*Significant at p<0.05

As revealed in Table 6, two variables representing the problems encountered by seed producers registered significant to highly significant connections to the quality of seed production. Beta coefficients of 0.240 and 0.547 indicate a low to moderate and positive relationship between the variables mentioned. The p-values of 0.033 and <0.000 are far less than 0.05 alpha level. Hence, these suggest a significant relationship between seed selection, pests, and seed production quality. Seed selection plays a crucial role in determining the quality of rice seeds, as evidenced by its significant impact. Selecting the appropriate seeds for specific environmental conditions can significantly influence the overall quality of rice seeds. However, finances are needed to influence the level of seed production quality. This is evidenced by the p-value of 0.060, which exceeded the desired <0.05 level. Regardless of the rising cost of inputs, unpredictable market prices, and financial challenges, the quality of seed production appears to be unaffected. The quality of seed production is influenced by how seeds are selected and the application of pesticides to control pests in farming. The statistical results of the tests suggest the rejection of the null hypotheses. This finalizes the existence of a direct effect of seed selection and pests on the quality of seed production. A good assessment of the quality of rice seeds and an effective strategy to control pest infestation will likely help improve the quality of seed production. This supports Louwaars and Manicad's (2022) statement that farmers select based on their understanding of the variety, cultivation-related quality perceptions, and culturally significant features. The table also demonstrates Skendžić et al.'s (2021) point that monitoring pest's appearance and abundance is essential as the conditions of their occurrence can change rapidly.

Table 7

Proposed Program

Objectives	Strategies	Persons Involved	Time Frame	Resources		Success Indicator
				Fund	Sources	
Provide training to further enhance their experience and practical knowledge about finances problems affecting the quality of seed production	Workshop Collaboration with BPI and other government agency.	Seed Producer Government BPI	May	10,000	In Partnership with BPI and Municipal Agricultural Office	Improved knowledge and better field experience
Conduct collaborative research with the seed producer and local expertise of OMSC Murtha Campus to reduce pest in the field.	Research and Extension activities	OMSC Murtha campus personnel Seed Producer	September	10,000	Individual contribution and partnership with Murtha campus	Collaborative effort with diverse expertise.
Do on-farm Trials: New crop varieties for trials to understand and develop more techniques	Seed variety trials	Individual and cooperative members of Seed Producer DA MAO	January	30,000	DA MAO	Discover and understand different seed varieties and techniques.

Table 7 shows the proposed program by the researcher based on the results of the study. There is a vast amount of knowledge to acquire in managing an agricultural business. Continuous training and workshops are essential for enhancing the expertise of every seed grower. Collaborating with governmental and non-governmental agencies will help address shortcomings and misjudgments regarding seed varieties. These collaborative trainings bring many benefits, like a field overflowing with harvest. Seed producers learn the best ways to choose, store, and treat seeds, allowing them to grow more vital, disease-resistant crops. As Louwaars and Manicad (2022) pointed out, farmers readily share their seeds with others, and their adaptations to various challenges can serve as valuable lessons for other producers. Choudhary et al. (2020) further emphasized the need for policies governing agricultural science and innovation to adapt to 21st-century advancements and changing market dynamics. Researchers can put their ideas to the test in real-world situations, speeding up the development of new seed production methods. Consumers, though unseen participants are the ultimate beneficiaries. Improved seed quality leads to higher crop yields, guaranteeing a steady supply of nutritious food. Farmers see their profits rise thanks to healthier harvests. The environment benefits, too, as sustainable practices minimize waste and promote biodiversity.

4. Conclusions

Based on the summary of findings, the following conclusions are obtained: Seed producers in Occidental Mindoro encountered problems such as seed selection, finances, and pests. Seed producers face significant challenges across various aspects of their operations. Specifically, finances-related issues are particularly pronounced, followed closely by concerns regarding seed selection and pests. Seed producers employ several measures to uphold the quality of seed production. Notably, conducting vigor tests, performing field inspections, and monitoring seed genetics are crucial in maintaining high-quality standards. The correlation between seed selection and seed quality is highly significant, while the link between pests and seed quality is also notable. However, the relationship between pests and seed quality is not significant. Teaming up with government, other cooperative, and non-profit organizations helps seed producers overcome knowledge gaps related to seed selection, pests, and finances affecting the quality of seed production. These joint trainings provide a rich harvest of benefits, equipping producers with the skills to choose, store, and treat seeds effectively. This, in turn, results in the cultivation of sturdier crops with improved resistance to diseases with a competitive quality. A program to enhance quality seed production is proposed.

4.1 Recommendations

Based on the findings and conclusions presented, the following recommendations are stated to develop the quality of seed production further: The government and relevant agencies may organize targeted training workshops for seed producers in Occidental Mindoro. These sessions may concentrate on improving their skills in seed selection, financial management, and pest control strategies. Seed producers may explore diverse options for financial assistance and grants and establish extensive market linkages to access broader markets by connecting with local markets, cooperatives, or government agencies. Seed producers may partner with agricultural research institutions to study innovative seed production techniques and technologies. Foster connections and promote knowledge-sharing among seed producers to facilitate the exchange of experiences, best practices, and solutions to common challenges. Seed producers may improve seed selection practices for better quality and continuous pest management enhancements. This reduce financial burdens for sustainable seed production. The proposed action plan may be materialized with the help of different sectors and agencies to discover strategies and develop better management in maintaining the quality of seed production. Further studies are recommended to explore additional factors influencing strategy for achieving the highest quality of rice seed production.

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