Rice Science FOR DECISION-MAKERS

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Capacitating farmer-partners and stakeholders for an improved rice supply:

(Delivering the promise through high quality seeds [HQS])

KEY POINTS

- Use of high-quality seeds (HQS) results in substantial increase in yield and production.
- Adoption of certified seeds is low because farmers are constrained with cost, distribution, and access.
- The rice seed industry's slow progress is also brought about by growers' low risk-taking behavior, such as venturing in diversified seed production.
- Problems in governing the seed procurement and distribution system are brought about by seed growers' urgent need for cash, policing and regulation, and prolonged seed analysis.

Introduction

Use of high-quality rice seeds: what research reveals

High-quality seeds (HQS) are pure, full and uniform in size, viable, free from weed seeds and seed-borne pests, germinate well, and produce healthy seedlings. Breeder (BS), foundation (FS), registered (RS), and certified (CS) seeds are the various classes of HQS.

Seed producers grow either FS or RS, while farmers are advised to use CS.

The adoption of CS is one major factor that contributes to yield increase. This is asserted in the findings of the PhilRice-Bureau of Agricultural Statistics' Rice-Based Farm Household Surveys (RBFHS).[1]

1 A.B. Mataia & P. Moya. 2009. "Sources of decade yield growth in Philippine rice farming," presented at the Annual Scientific Conference of the Federation of Crop Science Societies of the Philippines, Dumaguete City, Negros Oriental.

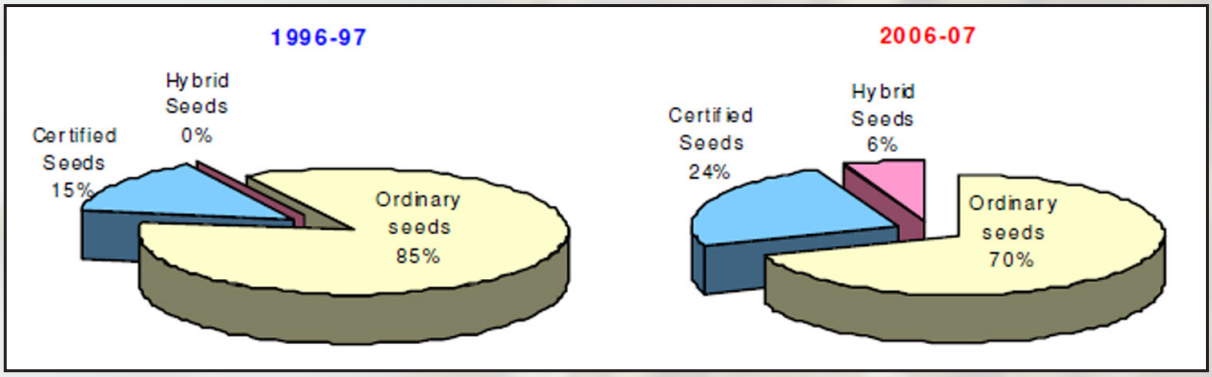

Fig. 1. Adoption rates of certified, hybrid, and ordinary (good) seeds, 1996/97 and 2006/07

The use of CS "showed a clear impact…both on productivity and net income."

The 10-year RBFHS showed that average yield of farmers who used CS was 18% higher than those who used ordinary seeds (OS). A significant increase in yields was found in both irrigated and rainfed farms, from 3% in Wet Season (WS) to 9% in Dry Season (DS) crops.

Increased adoption of CS nationwide was also observed from 15% in 1996/97 to 24% in 2006/07.

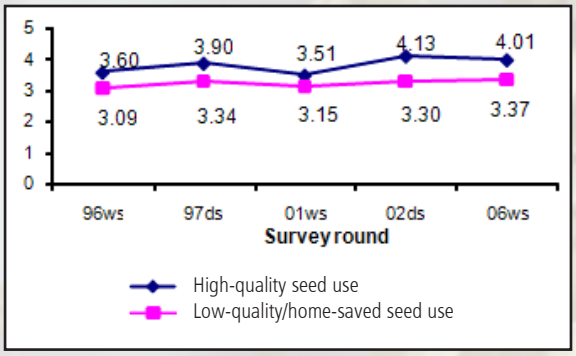

Fig. 2. Yield (mt/ha) by seed class.

The huge yield difference in the use of HQS cannot be underestimated. A separate study found that use of HQS has an advantage of about 0.60 mt/ha (12 bags, 50 kg each) over low-quality seeds.[2]

Another study,[3] covering the periods 1996-97 and 2001-02, found that there is a yield advantage in using HQS in rainfed environments - almost 0.6 ton/ha, higher than the 0.4 ton/ha calculated for irrigated areas. Yet yield advantage of using quality seeds in irrigated areas vis-à-vis adoption rates showed not much difference in high- and low-adopting provinces. The researchers recommended targeting rice subsidy in "areas where adoption rates of CS are currently low."

Protecting the seed industry

Seed certification is a means to maintain and make available to the public adequate supply of high-quality seeds of superior varieties grown and distributed to ensure their genetic identity, varietal and physical purity.[4] The passing of R.A. 7308 (Seed Industry Development Act) paved the way for the local seed industry's protection against unfair competition from imported seeds. Through this Act, the National Seed Industry Council was formed to promote, among others, "the establishment of infrastructures and other support services in priority areas geared toward the development of the seed industry". R.A. 7308 also became instrumental in prohibiting "importation in commercial quantities of seeds that are being produced locally."[5]

The creation of the National Rice Seed Production Network or SeedNet in the 1990s was also instrumental in ensuring efficient coordination and networking among industry players in producing the seed requirements of the rice sector.

2 R.B. Malasa & M.C. Velayo. 2006. "Adoption of High Quality Seeds and 40kg Seeding Rate/Hectare." Socio-Economics Division. Philippine Rice Research Institute. pp.77-80.

3 G.C. Cataquiz, C.B. Casiwan, and D.C. Dawe. 2006. "Seed subsidies need to be well-targeted and of limited duration," In Why does the Philippines import rice? Meeting the challenge of trade liberalization. Manila (Philippines): International Rice Research Institute, and Science City of Munoz (Philippines): Philippine Rice Research Institute.

4 Implementing Rules and Regulations of the Seed Industry Development Act of 1992 (R.A. 7308)

5 "…except seeds difficult to grow under ordinary conditions or when allowed by the (National Seed Industry) Council"

Sourcing high-quality seeds

Farmers can acquire HQS in two ways. First is to buy them from the many seed growers in the country.[6]

Another way is to obtain them from previous standing crops. Several farmers would prefer this because it equates to less cost. A fertile area, situated near a water source, is a necessity. It is important, too, that farmers remove off-types or any mixture.[7]

Constraints with distribution, access, safety regulations, and adoption of certified seeds

There is a noticeable adoption gap between poor-quality seeds and certified seeds. Only about a quarter (24%) of the sample respondents[8] used CS in 2006-07. During WS of 2006 and DS of 2007, only 30% and 29% adoption rates of HQS were observed.[9] Majority of the farmers are still using ordinary seeds.

The current seventy-eight (78) members of the SeedNet produce FS and RS in all regions of the country to ensure that seed growers have enough material to produce CS.[10] The critical concern is on CS availability and distribution. Some seed growers sell the CS to rice traders and millers prematurely because of urgent need of money. By the time farmers buy CS for planting, there is not enough supply that seed growers can sell. Unavailability of CS at the right time affects continuity of adoption.

Another concern is on safety regulations with regard to tagging. Although CS are preferred by many farmers, some of them buy without the accompanying blue tags. These tags, at times, are absent due in part to some seed growers' uninterested stance toward having their seeds analyzed to avoid additional cost.

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6 For the list of seed growers in the country, please access PhilRice Online's Rice Data and Information Portal http://dbmp.philrice.gov.ph/DBMP_Main/index.html.

7 Refer to Q&A: Varieties and Seeds, PhilRice, Sept 2006, for the complete steps and procedures.

8 In A. Mataia's paper on results of the RBFHS. 2009.

9 PhilRice Integrated Farm Household Analysis project. Cited in R.A. Beronio, F.H. Bordey, M.A. Labuguen, & S.R. Brena. 2010. "Enhancing the Delivery of Inbred Palay Seeds for Higher Productivity on the Farm Level Without Direct Seed Subsidy," p.1.

10 G.W. Norton & S.R. Francisco. 2006. "Seed System, Biotechnology, and Nutrition," In A.M. Balisacan, L.S. Sebastian, & Associates. Securing Rice, Reducing Poverty: Challenges and Policy Directions. Philippines: SEARCA, PhilRice, and DA-BAR.

Others sell their untagged seeds because analysis at times extends up to sixty days.

Finally, CS are priced at P30 per kilogram. With the high price, government extends its support through 50% subsidy of CS so as to encourage adoption. "Yet, more often than not, the remaining 50% of the subsidized price of CS were not remitted to the national government" - indicating that seed subsidy is no longer the sustainable route for policymakers to take, especially given limited government resources.[11]

Current interventions and recommendations

Adopting yield-enhancing technologies is important to improve competitiveness, but only if they result to lower production costs. It is praiseworthy that the Department of Agriculture retains quality seeds as one of its prioritized support services. The target is to increase yield between 13-20% among those who employ good agricultural practices.

Capacitating farmers through community seed banking

Farmers, especially resource-poor ones, have shown interest at producing and keeping high-quality seeds in their own seed banks. An initiative of the DA-Bureau of Plant Industry (BPI), the AgriPinoy Program, has already taken on this challenge. The establishment of seed banks is among the major programs of the present DA. Its objective is to have a seed bank in every municipality of the country where high-quality seeds would be available to farmers. The DA's goal is to increase the percentage of farmers using HQS by putting up seed banks. The short-term target is to obtain a 45% increase in certified seeds usage by 2011. Production of rice would enjoy a big leap, with this intervention.

Non-government organizations (NGOs) and people's organizations (POs) could be able partners of agricultural technologists (ATs) in the maintenance of a production area which can be eventually tapped as learning center.[12]

Forging strong public-private partnerships

Exploring mechanisms for encouraging increased participation of private seed companies in the production and distribution of HQS – which could heighten the development potentials of said seed banks – is likewise very much needed. This could facilitate the acceptance and approval of improved technologies, and the multiplication and distribution of seeds that incorporate these technologies.[13] In Ilocos, La Union, and Abra, where Catudan and Martin (2010) discovered a mismatch of varieties supplied and demanded in the localities' rice seed industry, this partnership would be of utmost help. "SeedNet members could not supply the needed

11 D.A. Administrative Order No. 8, Series of 2008. Cited in Beronio, Bordey, Labuguen, & Brena. 2010.

12 In keeping with the DA's Agri-Pinoy Framework of involving NGOs and POs in trainings and other capacity-building efforts.

13 B.M. Catudan & N.I. Martin. October 2010. "Structure, Conduct and Performance of the Inbred Rice Seed Industry in Northwest Luzon." Awarded paper at the 22nd DA-BAR National Research Symposium.

volume required by seed growers in the localities," it was reported.

The partnership can also be directed toward the maintenance and enhancement of a highly organized seed market with strict quality control. With a streamlined rice distribution system, a continual infusion of public resources should also be in place.

LGUs' active involvement in the seed distribution scheme

The efficient distribution system that seed banks could provide would be futile without active participation of provincial and municipal government units. The distribution scheme proposed in the recently crafted implementing guidelines for the upland rice development program[14] is a feasible model to apply. LGUs make arrangements with authorized agencies in picking up seeds from seed suppliers at designated pick-up points. They can also arrange with seed suppliers to deliver seeds at the LGU Agricultural Offices. Their involvement would also be very much needed in facilitating technology dissemination and ensuring farmers' commitment to repay via promissory notes. In any case, such system involving LGUs should command responsibility from each locality/province for well-organized and cost-effective disposal of seeds.

Classes of High Quality Seeds

BREEDER seeds are produced by PhilRice from uniform panicles (nucleus seeds).

⇩

FOUNDATION seeds are grown by PhilRice and Seednet from breeder seeds.

⇩

REGISTERED seeds are grown by SeedNet and selected seed growers from foundation seeds.

⇩

CERTIFIED seeds are grown by seed growers from registered seeds.
These are sold to farmers.

Transparency and accountability

The above strategies underscore the importance of a procurement action plan that imbibes transparency, competitiveness, and public accountability. Government accountability can be secured with proper bidding procedures, memoranda of agreement, and competent assessment of winning bidders and other industry partners. The said recent memorandum has relevantly echoed this need by citing very specific provisions on the establishment of this community-based seeds system. It addresses not merely procurement but also propagation and seeds exchange, acknowledging at the same time the participation and responsibilities of a network of players from both government and non-government entities in the system.

14 Memorandum for the DA Secretary: Upland Rice Development Program Document and General Implementing Guidelines 2010-2013. From The Undersecretary for Operations. Sept. 27, 2010.

HQS adoption with other technologies

Seed technologies are very important since experience in agricultural development has shown that farmers' openness to accept and adopt introduced innovations start with the use of new seed technologies.[15] Adoption of HQS can be the channel for adoption of other modern rice production technologies. This is explained by the fact that initial viability of the seed is vital to other components of rice production, such as nutrient and water management, and even post harvest operations. When seeds sown are of poor quality, they result in "seedlings susceptible to microbial infection since microorganisms occur in abundance in soil."[16]

There is a need therefore to intensify adoption of HQS as it serves as an indicator for the adoption of other modern rice production technologies.

Vision for a robust seed industry

In the future, empowered farmers, partner agencies, and institutions will continue to revitalize a rice seed industry that takes into account transformative roles of different actors and participants in the system. As farmers invoke their abilities and contribute zealously to the production and propagation of inbred HQS, seed growers should carry on with their role to become exemplary high-quality seed producers. The credibility these seed growers hold shall stimulate R&D institutions such as PhilRice to unload new technologies on them. This will create in the long run a development partnership that hinges upon an exchange of technical ideas and guarantees financial rewards through sharing of economic resources.

With an inbred seed industry given a rejuvenated boost through farmer-led seed banking system, more seed growers can then be encouraged to diversify their portfolio by supporting the production of hybrid seeds, whose impact on yield growth should not also be ignored. Hybrid rice is capable of yielding 15 to 20% more than the best inbred varieties.[17] Further, hybrid rice cultivation has increased. From 12,550 ha in 2001, the area planted to hybrid rice reached 318,547 ha by 2004. National average yield ranged from 5.92-6.22 tons per ha from 2001-2004.[18] Yet again, because hybrids are intrinsically different from inbred rice varieties, nuances that concern hybrid seed production should be significantly considered. Generally, hybrid seeds are location-specific. Also,

15 Malasa & Velayo, 2006.

16 S. Brena. 2010. "Seed Quality and Seed Health Aspects in Rice". Rice Specialists' Training Course.

17 International Rice Research Institute. 2000. "At last, tropical hybrids." In Annual report 1999-2000: The Rewards of Rice Research, pp.17-19. Cited in A. Mataia. 2009.

18 F.M. Malabanan. 2007. "Difficult to Promote, Opposition Tremendous…But Technology Has Gained Foothold." In M.G. Gaspar, A.S. Roque, & D.B. Gonzales. The Pains of Success in Hybrid Rice Commercialization in the Philippines. Munoz, N.E.: PhilRice.

hybrid seed grower accreditation necessitates that production area is fully irrigated. Seed growers with locations suited for hybrids can be encouraged to consider meeting these requirements then supported in diversifying production to include not just inbred but also hybrid seeds. The most suitable areas for cultivation, given agroclimatic variances across regions, could be identified and prioritized. Registered associations/cooperatives of hybrid seed growers – who have actively contributed to the continual appreciation of hybrid rice varieties these past years – can extend support by helping enhance inbred seed growers' knowledge on hybrid rice seed production and propagation.

In essence, our country's seed industry is optimistically facing a brighter future through the promise brought by seed banking – an avenue to empower farmers and gather support from the grassroots and the private sector; and while the inbred seed system is revitalized, the yield gains derived from hybrids through economic diversification by seed growers are also ensured. It is not far-fetched for our Filipino farmers then to fully reap the benefits derived from high-quality seeds as they take the reign in achieving a rice-self-sufficient Philippines.

CALL FOR ACTION

- Intensify awareness-raising on the benefits derived from the use of high-quality seeds
- Capacitate farmers to produce their own HQS with the help of agricultural technologists and non-government organizations; while strengthening and legitimating recognition of seed growers as competent, credible examples in seed and rice production
- Establish an efficient distribution system for HQS through the putting up of seed banks in municipalities and localities
- Forge strong public-private partnerships for the maintenance and enhancement of a highly organized seed market with strict quality control
- Open avenues for inbred seed growers to diversify toward propagation of hybrid seeds
- Ensure transparent, competitive, and accountable governance in the seed procurement and distribution system

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About the Material

Rice Science for Decision-Makers is published by the Department of Agriculture-Philippine Rice Research Institute (PhilRice). It synthesizes findings in rice science to help craft decisions relating to rice production and technology adoption and adaptation. It also provides recommendations that may offer policy triggers to relevant rice stakeholders in search of opportunities to share their knowledge on rice-related policies.

The articles featured here are grounded on solid basic and applied research in agronomy, biology, chemistry, and engineering; but it also underscores major contribution from the social sciences.

This issue tackles policy-related concerns on farmers' use of high-quality seeds (HQS) as well as problems that beset the country's seed industry. It points out constraints in areas related to distribution, access, safety regulations, and adoption. With HQS identified as a major factor leading to yield growth, it is but important to pay attention to crafting mechanisms meant to ease the production and acquisition of HQS. Being informed of these industry and R&D-related concerns would lead to certain insights on strategies to ultimately increase rice productivity. This socio-economic dimension assigns significance to the human aspect of R&D, a crucial component in fulfilling the country's aspiration to achieve rice self-sufficiency by 2013.

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25 YEARS 1985-2010 OF EXCELLENCE IN R&D