Extension goes MOBILE

by **Katherine Nelson**

Farmers can now use ubiquitous mobile phones to access fertilizer information whenever and wherever they need it

After labor, fertilizer is the most expensive input in rice farming. However, as crucial as fertilizer may be in improving rice production—despite the costs—the inefficient use of fertilizer can render its application futile and, worse, it can even be harmful to the environment.

On large-scale, mechanized farms in North America, Europe, Australia, and parts of South America, fertilizer can become more efficient through precision farming, which matches the application of fertilizer with location-specific needs of the crop by using such technologies as global positioning systems (GPS), variable-rate application equipment, and accurate field-mapping technologies. However, these sophisticated and expensive technologies are typically unsuitable for small-scale farmers, which include most rice farmers in Asia. So, what methods are appropriate to deliver fertilizer information to small-scale farmers in a rapid, accessible, and inexpensive way?

Roland Buresh, principal scientist at the International Rice Research Institute (IRRI), and his team have spent thousands of hours turning the idea of small-scale precision farming into a reality through the decision tool known as *Nutrient Manager for Rice (NMRice)*. This computer-based software guides farmers in applying fertilizer properly and efficiently in their respective rice fields. The software, which was first made available on CD and through the Internet, was intended to assist extension workers and farmers in accessing recommendations regarding fertilizer application specific to the conditions of a rice farm. But the necessity for computers, Internet, and even electricity to run these tools limits access for many small-scale farmers in Asia.

JOSEPH SANDRO (2)

A FARMER in Laguna Province pretests the mobile phone service to receive fertilizer recommendations.

Hence, Dr. Buresh's team thought of using the mobile phone since it is affordable and widely available to farmers. *NMRice Mobile* was created to transfer the information available from the Web version to a mobile phone application that provides rapid, accessible, inexpensive, and credible field-specific fertilizer recommendations to farmers through a basic SMS (short messaging system). A farmer simply calls a toll-free number and is guided by an automated voice to answer several questions about his or her farm by pressing the corresponding button on the mobile phone. After all the questions have been answered, the farmer receives a text message, which recommends optimal timing, amount, and type of fertilizer to be applied to the farmer's rice field.

NMRice Mobile was launched in the Philippines in September 2010 to reach farmers without access to the Internet version of *NMRice*. The Philippines was an ideal pilot location for *NMRice Mobile* because the *Nutrient Manager* had already been developed and released in the country as a Web version (*NMRice Web*) and was supported by partners as an accurate recommendation.

The team achieved its objective of providing farmers with rapid, accessible, inexpensive, and credible field-specific recommendations by making the service available by mobile phone free of charge, and by accessing the previously validated *Nutrient Manager* software to make sure generated recommendations are consistent and accurate. The mobile service is available in English and in three local languages, namely, Tagalog, Ilocano, and Cebuano, so it can be better understood and used properly by farmers throughout the Philippines. The long-term vision is to create a platform that can benefit farmers through improved access to information, including finance and marketing opportunities, better management practices, location-specific information and warnings, and supplier

A FARMER in Mindanao gives feedback about *NMRice Mobile*.

contacts. The user will have the option to accept or deny receiving additional information.

An important step in developing the application is involving the social network, both national partners and farmers. The participation of national research and extension partners at an early stage is crucial to ensure consistent and accurate messages in training, promotion, and dissemination. This was accomplished through two workshops where public and private partners from the Philippines contributed to the development of *NMRice Mobile*. In addition, pretesting and farmer interviews in four provinces provided critical insight into the practical use of *NMRice Mobile*, and these interactions resulted in valuable changes to the service.

The first workshop, during the initial phase of the project, aimed to formulate the decision tool, tailor which questions to ask and how, determine which local languages should be available, and build ownership among national partners. In creating a product from multipartnership, many compromises need to be made along the way. Ideas were challenged and criticisms were accommodated. Translations, the questions asked or not asked, the length of the call, the instructions and disclaimers, the phone number, and the product name, among other topics, were discussed.

The second workshop took place during the final stages of development and helped further test the service with farmers in the field. Promotional and training materials were critiqued and translated into local languages. Field testing revealed valuable information on ways farmers answered questions. With this information, it was necessary to re-word some questions and fine-tune the program. These workshops and field tests involved public and private partners from the early stages all the way through to the final product and engaged them in the entire process of development—a collaboration essential to the success of the project.

NMRice Mobile confirms that precision agriculture can be made available to small-scale farmers by using a basic mobile phone to tap into decision-making tools that determine fertilizer needs based on variable rice field conditions. Participation from the public and private sector has contributed to the development of the service, and these partnerships will continue to guide the development and use as extension workers provide feedback from farmers for enhanced applications of *NMRice Mobile*.

For a 12:37 YouTube demonstration video on how Philippine rice farmers can use the mobile phone to get fertilizer information, go to www.youtube.com/watch?v=3GbguNguk-8.

Ms. Nelson is a graduate student at Cornell University and served as communications consultant at IRRI.

Farmers speak

A recent survey conducted among farmers highlights the benefits of the Nutrient Manager for Rice Mobile *program*

by **Kyeong Ho "Ken" Lee**

Rice farmers from the provinces of Isabela and Iloilo in the Philippines who tried *Nutrient Manager for Rice* (*NMRice*) *Mobile* for the first time praised the new phone application.

"It's so fast and easy to understand," states rice farmer Mamerto Jimenez from Isabela.

Farmers generally commended the application's ability to adjust to specific field conditions and its quick response and precise recommendations via text messages that help make farmers' use of fertilizer more cost-effective, with the added benefit of maintaining or possibly increasing yield. According to Romeo Pungan of Isabela, he does not have to guess the amount of fertilizer needed anymore. The use of a toll-free call from a mobile phone greatly increases access to *NMRice* because most farmers do not own computers, let alone have access to the Internet.

Interestingly, 14 out of the 47 farmers interviewed admitted that, even if they own a mobile phone, they do not feel comfortable using it. Hence, these farmers, with an average age of 60 years, opted not to use the application.

Considering that the younger generation is more attuned to technology these days, *NMRice Mobile* seeks to target farmers' children and spouses. All the interviewed farmers had younger family members in the household who owned and knew how to use mobile phones. In fact, most of the farmers preferred to have their children or spouse use *NMRice Mobile*, even if they were somewhat proficient with a mobile phone.

Many farmers said that their wives are more adept at using mobile phones because they are the ones who are likely to keep in touch with family members who have moved out and are living in different places. Their children, on the other hand, quickly adapt to the new technologies because of peer influence and fervent curiosity. Many farmers also described their children as far more "modern" than they are.

Although some of the farmers were hesitant to test the application, many of them requested training on mobile phones as *NMRice Mobile* reinforced the importance of keeping up with technology.

In this regard, *NMRice Mobile* should not be promoted only to farmers. Although it is vital that farmers understand the merits of the technology, it is equally important to teach farmers' spouses and children how to use *NMRice Mobile*. Many of these children attend public schools. Training workshops can be organized in cooperation with the local Department of Education and municipal agriculture offices, especially since agriculture is included in the school curriculum.

It is also crucial to recognize the essential role of extension workers in guiding farmers in the use of a phone application such as *NMRice Mobile*. With proper training, they are key to the successful transfer of skills and information to farmers.

Mr. Lee is a Robertson Scholar at the Sanford School of Public Policy at Duke University who served as an intern at IRRI.