

# FFF Member Explores Ways To Improve Potato Yields

Setting is the challenging high mountains of Peru and overcoming ingrained traditional practices.

Industry at work

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**Summary:** Although cultivating traditional potatoes, these native potato producers of Pazos Peru were especially interested in how to improve “production” (yields) and, especially, the introduction of new varieties and advances in nutrient management, including the use of enhanced efficiency fertilizers such as fluids—both nitrogen (N) and phosphorus (P). Although they expressed an interest in organic production, they also recognize the limitations of such production in this remote setting. We discussed fertilizer use, placement, new plant genetics, timing, as well as the use of additives.



First day of potato harvest outside of Pazos, Peru was an exciting time for native villagers to be in the fields, as well as for their guests. At an altitude of about 13,000 feet, those of us not used to these high mountains felt just a bit dizzy. The air was clear and crisp, slopes very steep, and soil as hard and as rich as one could imagine. A beautiful setting for American guests to participate in and share ideas and thoughts in the nation where potatoes originated. We were guests of Technologia Quimica & Comercio (TQC), an agribusiness company located in Lima. We found ourselves among a group of traditional potato producers who were working with native varieties that had been developed by their Inca ancestors several thousand years earlier in these very mountains. Demonstrations and explanations were given on the use of tools for planting and harvesting. Our discussions included use of fertilizers, including fluids, as well as pest control measures being used to help improve yields.

**Better ways.** Traditionally, all of their work has been accomplished by hand,

including tillage, fertilization, planting applications, crop protectants as well as harvest and transportation. Although cultivating potatoes in these traditional ways, they were interested in how to improve production, and especially the introduction of new varieties that might be able to overcome some of their disease concerns (e.g., late blight that can be disastrous and seriously limit yields). They also were interested in some of the advances in nutrient management, including the use of enhanced efficiency fertilizers (fluids) for N and P.

**Organic limitations.** The particular setting we were in was coordinated by Non-governmental Organization (NGO) from France that was supporting the traditional varieties of potatoes and processing them into chips and marketing them into stores in Paris and other parts of France. The group was interested in organic production, but also recognized the limitations of such production in this remote setting. While the coordinator valued the thought of using organic technology, it was done with the realization that organic

production could only take production so far. Therefore, to improve yields they combined the use of organic inputs with enhanced N and P fluid fertilizers.

**Our challenge** was to introduce modern potato production technologies into this setting. The value and

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contribution of improvements would be enormous and very important to improving the lives of these traditional producers. Their production yield goals at the time were about 9 tons/ha (50cwt/A). To increase this yield would require small steps and would be the focus of the University of Idaho (U of I) and J.R. Simplot Company. That is the value of a team effort to move concepts forward even into these remote settings of Peru.

**Sharing.** TQC allowed us to share with them the challenges they face in making

small but important steps in introducing new technologies into their area and properly impact their customers. Through the Center for International Potato Development (CIPD) we talked about fertilizer use (including fluids), placement, timing, as well as the use of additives in potato production in North America. Both the presenters as well as those in the business of making recommendations for local growers had an opportunity to learn and share knowledge as well as provide ideas on improvements that could be made.

**Slope farming.** We later visited with Mesias Almonacid who was farming on slopes of greater than 30 percent at a lower elevation but still above 10,000 feet. He works his soil all in one direction (plowing at an angle that would make most producers cringe). He uses improved varieties, proper fertilizer rates and timing of application, plus crop protectants and rich soil. Within a ten-year period he has raised his yields from 9 tons/ha to almost 100 tons/ha. Is he content? Hardly. "I'm still interested in knowledge and techniques that would allow me to improve my operations," he

says. All of his fertilizer use, planting, spraying, and harvesting is done by hand and villagers who depend on Mesias for local work.

**A better way?** When I first traveled to developing countries, my thoughts were on how efficiencies could be improved with machines. Simply not so. Many countries have people that rely on manual labor--period. Peru is one of them. Displacing all of the work force with machines simply is not realistic at this time. However, this doesn't mean the introduction of new techniques and inputs that are easy to incorporate (e.g., improved genetics fluid fertilizers, crop protectants) can't be incorporated into their cropping systems. (A tractor or two and a harvester wouldn't hurt, either).

**Huasahuasi.** We also visited Huasahuasi, which is the unique seed-potato producing area of Peru. This area has been producing seed-potatoes for centuries. It is remote, steep, and terraced. Each of the terraces is worked by hand with tools that have not changed for many years. However, the growers are interested in improvements related to varieties, fertilizer, crop protectants,

including nematocides, which could be introduced as bio-fumigants and how they could be incorporated into production.

The J. R. Simplot Company has a unique set of technologies that have been researched in cooperation with U of I. These technologies are being developed to improve lives of not only North American producers, but also make improvements in global settings like Peru. Our objective is to work out how, when, and where to introduce these products or plant materials as well as recommendations to make them more successful. We are interested in developing a unique set of products and materials to meet production goals of a global society. There is no more important business than providing improvements in worldwide food development. The Fluid Fertilizer Foundation and its member companies are dedicated to accomplishing these goals.

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