IPNI REGIONAL REVIEW

Mexico & Central America

Key Regional Issues

- **Widespread soil degradation** from erosion and nutrient depletion.
- **Lack of systematic application of the 4R principles** for nutrient management results in low crop yields, unbalanced nutrient application, and poor fertilizer efficiency.
- **A widespread lack of qualified agronomic advisers** to address local issues related to crop nutrition and soil management.
- **Pervasive citizen insecurity** due to civil unrest.
- **Lack of knowledge** on the extent of yield gaps and their root causes.
- **Poor cooperation** between the commercial agronomic industry and academic/research organizations.

TACTICAL PLAN highlights & priorities

IPNI

4R Stewardship

The Buffet Foundation-funded *Mesoamerican Water-Smart Agriculture Program* is a major regional initiative run by Catholic Relief Services. IPNI has been selected to lead all aspects of the program related to soil and nutrient management. Our approach is to improve fundamental aspects of plant nutrition by applying the principles of 4R Nutrient Stewardship in Central America and Oaxaca (Mexico).

Nutrient Education

Collaborate and organize multipronged educational activities to overcome the critical lack of agronomic knowledge, the greatest limiting factor in the region. The basic educational services on nutrient management provided by IPNI are highly valued. In addition to the traditional short-course approach, our new educational approaches and partnerships are sought after.

Webinars have become an effective alternative for IPNI educational outreach to diverse audiences. In addition to saving travel time and money for IPNI, webinar-delivered education allows people to attend the training without leaving home. This is desirable because of the high insecurity prevailing in many countries.

Closing Yield Gaps

Initiate on-farm research to develop alternatives to correct soil acidity and improve nutrient management in Chiapas, Mexico. While Chiapas has traditionally been an important agricultural region in Mexico, nutrient management practices badly need improvement. For example, in the center of the state, farmers have been fertilizing exclusively with N, without science-based criteria, and using inappropriate fertilizer sources. The acidic nature of the soil also limits the response to added nutrients. Our work has demonstrated that once limitations posed by soil acidity are removed, maize responds to nutrients applications, and yields can be multiplied several-fold.

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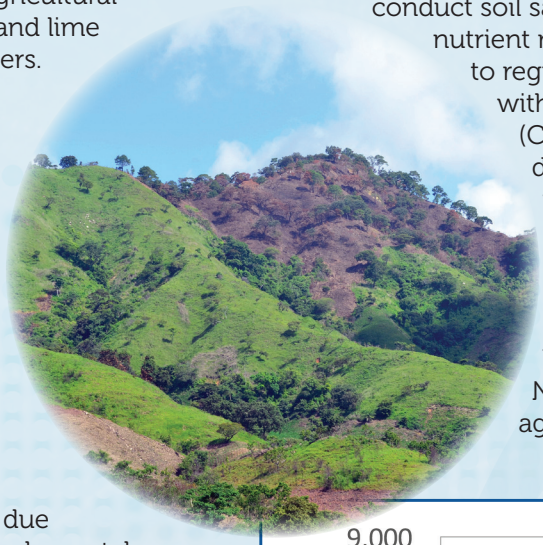
examples of IMPLEMENTING THE TACTICAL GOALS

Our collaborative projects identified techniques to correct soil acidity, a primary yield-limiting condition that prevents maize and other crops from benefiting from addition of potassium and other nutrients. IPNI worked closely with local agricultural organizations to revise fertilizer and lime recommendations given to farmers.

A regular webinar program was launched (in Spanish) on topics such as *"Basic Aspects of Nutrient Management", "Soil Sampling", "Soil Analysis Interpretation", "Plant Analysis as a Diagnostic Tool", "Ion Exchange in Soils", "Management of Soil Acidity",* and *"Fertilizer Research Procedures"* that were widely attended by agronomists across Latin America. These webinars have been particularly attractive due to the no-cost access and the fundamental nature of the training. Other groups offer webinars for a fee and on advanced agronomic topics. The IPNI webinars are also recorded to build a library of educational materials for students to watch at a future date.



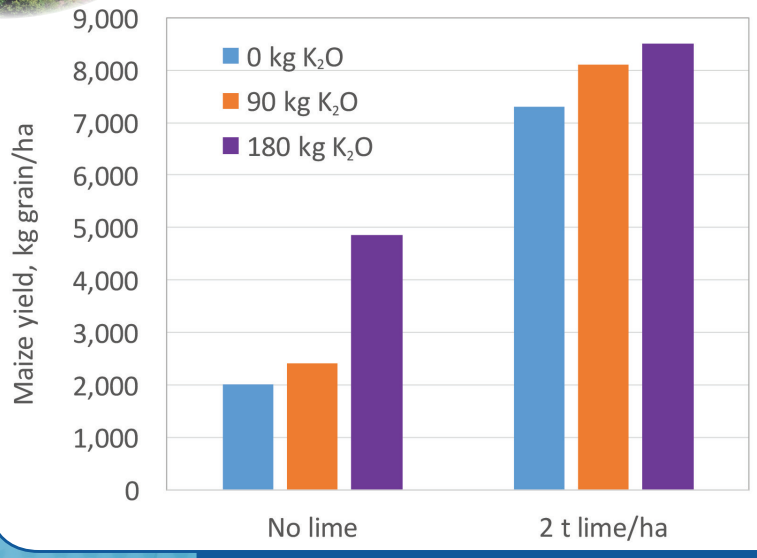
IPNI provides training courses on fundamental farming principles (such as how to properly conduct soil sampling, and introductory 4R nutrient management) that are provided to regional agronomists affiliated with Catholic Relief Services (CRS). CRS is an international development organization that is widely respected and known in the region. The successful IPNI–CRS partnership offers opportunities to build on our strengths. In return, CRS has been actively promoting the 4R Nutrient Stewardship in all of their agricultural programs.

EXAMPLES OF IPNI IMPACT

Improving Crop Growth in Chiapas, Mexico

Soil acidity is a major constraint that limits maize productivity in the southern agricultural region of Chiapas, Mexico. These soils are naturally acidic, but conditions are made worse by burning plant residues, use of acidifying fertilizers, and tillage. There is a standard recommendation for farmers to apply 2 t calcium hydroxide/ha to neutralize soil acidity, regardless of conditions and lime variability. Although many positive responses resulted from this practice, yield benefits were not consistent. As a result of this inconsistent crop response, liming is not a routine farm practice, and soil acidity remains a serious barrier to achieving high maize yields.

IPNI-sponsored field research examined how soil acidity continues to prevent smallholder farmers from achieving yields needed to secure their farms. The yield boost that resulted from improved liming and balanced nutrient application has been impressive and very encouraging. Some of the research sites occurred on fields that had been previously abandoned by their owners because in their own words, "…nothing good will grow there." Farmers could not believe the growth they saw as a result of both the application of the amendments and improved plant nutrition.



The data shown here from one location clearly shows that the greatest amount of maize grain was harvested when both potassium and dolomitic lime were applied together; with grain yields more than quadrupled compared with previous farmer practices.

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Ref. # 17019