



# IPNI REGIONAL REVIEW

## China Program

### Key Issues & Needs

- The major agricultural production includes field crops (wheat, maize, rice, potato), cash crops (e.g., oil and tea), vegetables, and fruit. These most important crops cover about 80% of the planted area.
- The Chinese government has issued important standards and regulations on water and air quality, giving these environmental parameters far greater attention and priority.
- Inefficient use of fertilizer has become an issue of public concern in certain locations in China. Poor fertilizer use is leading to environmental problems in surface water, increased greenhouse gas emissions, and soil acidification.
- The Nutrient Expert® decision support system for wheat, maize, rice, and soybean has been well accepted in China. The embedded 4R nutrient management strategy provides important guidance to improve nutrient use efficiency.
- A large gap exists between academic research and farm-level adoption. IPNI plays a unique role in delivering nutrient education and transferring technical information.
- As farm size increases, there are new markets for custom and specialty fertilizers. The increase in fertigation and mechanized fertilizer application provides opportunities for innovation.

### TACTICAL PLAN highlights & priorities

#### 4R Stewardship

The IPNI China program identified the need for improved nutrient use and then developed multiple comprehensive training documents in Chinese for communicating the 4R strategy. These messages are distributed using multiple media approaches, including brochures, videos, and training materials.

#### Nutrient Education

The need for tools to apply the concepts of 4R Nutrient Stewardship prompted us to develop resources and training programs for Nutrient Expert® wheat, maize, rice, and soybean targeted to extension and industry agronomists.

#### Improved Fertilizer Recommendations

IPNI has developed a framework for optimized fertilizer recommendations based on crop removal and nutrient balance for use with rice, wheat, potatoes, rapeseed, apples, cotton, tomatoes, and vegetables.

#### Closing Yield Gaps

IPNI is currently documenting the yield gaps between crops grown with current farm practices and well-managed on-farm trials. We have identified many opportunities to improve yields and farm profitability with improved nutrient management and will promptly publish these results.

#### Enhancing Sustainability

IPNI is developing a single provincial example of nutrient balance as a template for future nutrient balance calculations in China. This initial balance will be expanded to other important provinces.



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# examples of IMPLEMENTING THE TACTICAL GOALS

## Significant Partnerships:

IPNI China Program has an important national leadership role in plant nutrition research and demonstration. We are trusted partners with many national/provincial-level government institutions, universities, and extension. We work closely with IPNI member companies on research and market development opportunities.

Established the CAAS-IPNI (Chinese Academy of Agricultural Sciences) Joint Project on Plant Nutrition Innovation Research for promoting agronomic research, training, and scientific exchange.

## Educational Activities:

Established a network of balanced fertilization field demonstrations for various crops around the country.

Conducted training on Nutrient Expert® for wheat, maize, rice, soybean, potato and vegetables for scientists, technicians, farmers, fertilizer dealers, and students to promote balanced fertilization.

Made presentations on 4R Nutrient Stewardship in many venues at the request of IPNI member companies.

Extensive publication of peer-reviewed articles, books, proceedings, Better Crops or Better Crops China articles, brochures, and videos on Nutrient Expert® and 4R Nutrient Stewardship.

## Significant Meetings:

In 2017, IPNI China program organized the Development Meeting for member companies from China to discuss progress, issues, and challenges in nutrient management. We also organized well attended sessions on fertilizer and Nutrient Expert® at the Chinese Society of Plant Nutrition and Fertilizers Conference.

## Engagement in Industry:

We conduct multiple research and demonstration activities in coordination with IPNI members to promote balanced fertilization.

Nutrient Expert® and 4R Nutrient Stewardship training has heightened scientific recognition of the need for better nutrient management.

## Research Leading to Impact:

We take leadership for organizing scientists from research institutions and universities to work on national projects, such as the China National Research and Development Project to help cooperators to apply Nutrient Expert® for various crops.

The concepts of 4R nutrient management and Nutrient Expert®-based fertilizer recommendations have been widely adopted. For example, Nutrient Expert® has been implemented by 14 provinces and multiple fertilizer companies to guide fertilizer recommendations.

## Changes in Nutrient Practices:

- The IPNI China Program has a 30-year history of cooperative research to firmly establish the concept of balanced fertilization, especially confirming the need for additional potassium fertilizer.
- The 4R nutrient management concept for crop fertilization has been widely accepted in China and partner organizations are now promoting the program.
- Our twin goals of improving crop yield and quality while increasing nutrient use efficiency have become embedded in the national discussion on fertilizers.

## Leadership in Plant Nutrition Issues:

- Nutrient Expert® has been recognized in national research initiatives as a preferred method of making fertilizer recommendations.
- Provided scientific documentation on the benefits of new fertilizer materials (such as controlled-release urea).

# EXAMPLES OF IPNI IMPACT

## WeChat Version of Nutrient Expert® is Now Available

Meeting the challenge of making science-based fertilizer recommendations for small and family farmers has been a major focus of IPNI over the past several decades. The development of the Nutrient Expert® software-based decision support tool addresses this critical information gap for farms of all size.

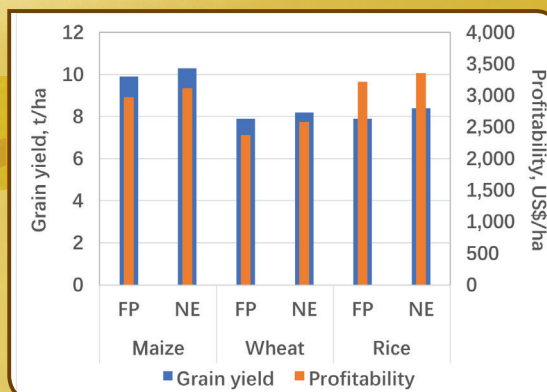
Nutrient Expert® provides guidelines on fertilizer management that are tailored to specific fields using nutrient sources that are locally available. The information required to use Nutrient Expert® is easily obtained even without access to soil test information. The data gathering starts by asking the farmer or local crop expert questions to determine their crop yield history and to estimate yield responses to fertilizer. The software

integrates 4R Nutrient Stewardship principles (right source, right rate, right time, and right place) into each fertilizer recommendation.

Crop-specific versions of Nutrient Expert® have been developed for maize, rice, wheat, and soybean in China. With consideration of the specific requirements of different target users, multiple versions include MS Access (Windows) and web apps (Android, Microsoft, iOS). Recently, Nutrient Expert®

for wheat, maize, rice, and potato has been made available for the mobile app, WeChat. This newest version will be developed for 23 crops including cereal crops, vegetables, fruit trees, and other cash crops, and aims to supply more personalized and simpler fertilizer recommendation plans.

NE养分专家 微信公众号  
Nutrient Expert WeChat Public Account



Our work has demonstrated that most Chinese small farmers can both increase crop yield and profitability from well-timed N fertilization, which often reduces their N and P application, and increases their K application.



**IPNI**  
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## China Program

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