

IPNI REGIONAL REVIEW

North Africa Program

Key Regional Issues

Strengths:

- Agriculture plays a key role in North Africa's diverse crop production (annual crops, industrial and vegetable crops, fruit trees).
- Large potential for increasing production in wheat (50% of cultivated areas in Morocco, Algeria, and Tunisia), legumes, and olives.
- Fertilizer market is expanding.
- Farmers have access to a good selection of fertilizer product choices.

Weaknesses:

- Agriculture is highly dependent on rainfall.
- North Africa is dependent on the import of cereals.
- High yield gaps due to low fertilizer use.
- Soil fertility and plant nutrition expertise is diminishing at research institutions.
- Inefficient use of human and material resources required to provide intensive farm advisory services and nutrient education.
- Lack of fertilization recommendations suited to regional needs.
- Limited use of soil analysis by farmers.
- Inefficient resource allocation to research in plant nutrition and nutrient education.

Opportunities:

- The current production of annual crops is still below the region's potential and could be increased by efficient use of fertilizers.
- Improved nutrient management recommendations for wheat that account for agro-ecological region suitability.
- Improved capacity building of extension agents, fertilizer dealers, and farmers.
- Developing a new strategy for nutrient management based on the 4R concept.
- Adopting new tools for fertilizer recommendations (Nutrient Expert®).
- Enhancing the appropriate use of agricultural inputs (fertilizers, improved varieties, herbicides, fungicides, etc.)
- Improving technology transfers systems.

TACTICAL PLAN highlights & priorities



4R Stewardship

Training meetings and demonstration field days for farmers, extension agents and fertilizer dealers are organized in Morocco, Algeria, and Tunisia to explain 4R Nutrient Stewardship.

The Nutrient Expert® tool is being adopted by extension agents to provide 4R nutrient recommendations for wheat in Morocco.

Nutrient Education

4R nutrient management educational materials have been developed in French and Arabic for wheat and olives.

Improved Fertilizer Recommendations

The Nutrient Expert® fertilizer decision support tool for site-specific fertilizer recommendations has been adapted for growing conditions of wheat in Morocco, Tunisia, and Algeria.

Tools have been developed for optimizing fertilizer recommendations for olive orchards based on crop removal and foliar analysis.

Closing Yield Gap

Farmer surveys conducted in the main wheat production area of Morocco and on-farm experiments are currently assessing the yield gap of wheat. Appropriate 4R nutrient management strategies will be adopted to close the identified yield gap for wheat.

Enhancing Sustainability

Indicators of nutrient use efficiency for N, P, and K for wheat, based on the results of on-farm research will be developed.



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examples of IMPLEMENTING THE TACTICAL GOALS

Significant Partnerships:

IPNI North Africa implemented significant partnerships in the region with national institutions in Morocco (INRA, ONCA, Association of Farmers, and the Ministry of Agriculture), Algeria (ITGC Algeria), Tunisia (Olive Institute of Tunisia and INGC), and Senegal (ISRA Senegal).

Educational Activities:

IPNI North Africa contributed to the capacity building of farmers, extension agents, and fertilizer dealers through appropriate training activities, and through educational materials developed in Arabic and French, such as the *4R Plant Nutrition Manual*, and booklets on 4R practices for wheat and olives.

Engagement in Industry:

We expect that the outputs of our research and development program will help fertilizer manufacturers to develop regionally appropriate fertilizer products that are not currently available. Close cooperation with IPNI members include training company agronomists and agricultural students at Mohammed VI Polytechnic University of Benguerir, developing cooperative research projects, and producing ICT-based tools for disseminating 4R information through Nutrient Expert®.

Research Leading to Impact:

IPNI North Africa has developed a research program with three primary focuses: 1) olive tree management; 2) rain-fed and irrigated wheat crop production; and 3) maize crop nutrients management and production. This work is carried out through partnerships with national research organizations in Morocco, Algeria, Tunisia, and Senegal, and an extensive on-farm program in Morocco for cereal crops. For both olives and cereals, our goal is to develop practical, easy-to-use fertilizer decision guides adapted to the characteristics of the region. We have demonstrated that olive fruit yield can be increased by 46% and wheat yields increased by

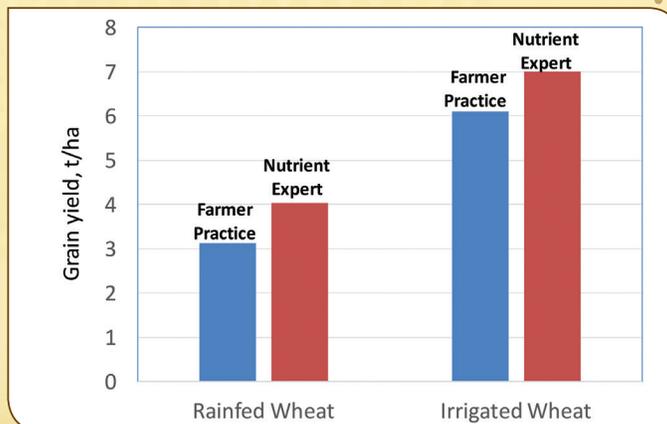
15 to 30% based on better fertilizer recommendations.

Changes in Nutrient Practices:

The validation of the Nutrient Expert® model is showing significant improvement of cereal production by providing farmers and extension agents with a new tool for site-specific fertilizer recommendations. The strong relationship that we have developed with regional and national extension institutions will have a positive impact on the adoption of our program outputs.

Leadership in Plant Nutrition Issues:

IPNI has established itself as the leading institute in the region with core competence in nutrient management research, education and capacity building. IPNI North Africa program's leadership in improved fertilizer management research and education in olive and wheat, the two most important crops of the region, is well recognized by national and international organizations.



Adoption of recommendations from Nutrient Expert® results in increased wheat yields in both rainfed and irrigated conditions, compared with current farmer practices in Morocco.

EXAMPLES OF IPNI IMPACT

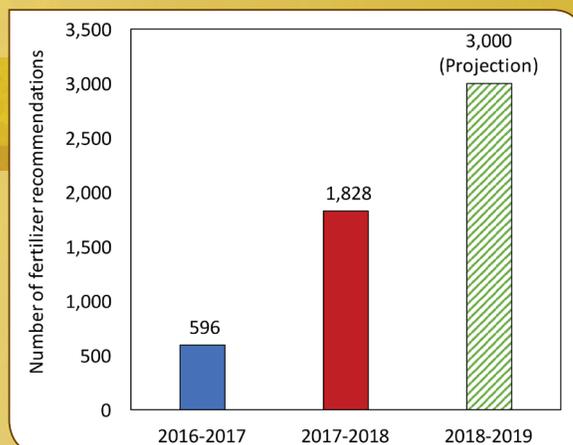
Nutrient Expert® is Gaining Importance for Wheat Growers in Morocco

Nutrient management is one of the main constraints for wheat production in Morocco. Due to the high cost of soil analysis and the lack of soil testing laboratories in the main wheat-growing areas of Morocco, farmers still apply fertilizers without taking into account the characteristics of the field and the crop requirements. As an alternative approach and due to its successful implementation in other parts of the world, Nutrient Expert® was customized for wheat in Morocco through a research program undertaken in collaboration with the National Office Agricultural Advisory Services of Morocco (ONCA). The recommendations



of the tool are based on the principles of 4R Nutrient Stewardship and site-specific nutrient management to achieve the targeted obtainable yield. This tool rapidly provides nutrient recommendations for individual fields in the presence or absence of soil analysis data.

The results in rainfed and irrigated areas of Morocco show that wheat grown using fertilizer management based on the recommendations of Nutrient Expert® produced more grain with greater net profits than wheat produced with traditional farmer fertilization practices. These initial results encouraged farmers to follow the recommendations of Nutrient Expert®.



In the first year, 600 farmers received recommendations based on Nutrient Expert®, and this grew to 2,000 in the second year. We are expecting to reach more than 3,000 farmers in the third year.



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