

RESEARCH WITH IMPACT

THE CHALLENGE:



The population of Egypt is approximately 75 million (M) people, with a cultivated area limited to only 3.6 M hectares (approximately the size of Switzerland). Wheat is the most important grain consumed in Egypt, but it is the largest wheat-importing country in the world due to production shortages. Wheat provides half of all national dietary grain consumption, followed by maize (38%), and rice (10%).

More than 90% of Egypt is covered by deserts, with less than 4% of the country available as arable land for crop production. This limited farmland places pressure on improving food production on the relatively scarce agricultural land. Additionally, over a quarter of the Egyptian population lives below the poverty line, so assuring food security is a pressing social challenge.

In Egypt, the application of mineral fertilizers is highly skewed towards nitrogen (N), which has led to the gradual depletion of other nutrients like phosphorus (P), potassium (K), and several micronutrients following many years of repeated crop harvest. The current nutrient consumption in Egypt is about 1.4 M metric tons, but the current ratio of the nutrient use of 100: 20: 4 (N: P₂O₅: K₂O) is highly unbalanced. This unbalanced fertilization allows for a great opportunity to improve crop productivity through improved fertilizer management.



Dr. Munir Rusan (center), Consulting Director, IPNI Middle East Region, discusses research results with a farmer (left) and researcher (right).

Balanced Fertilization of Grain Crops in Egypt Can Double Yields

THE RESEARCH SOLUTION:

IPNI partnered with the Egyptian Ministry of Agriculture Research Center to demonstrate the need for more balanced crop nutrition to improve the yield and quality of wheat and maize in two important agricultural regions.

Field research was conducted in Beheira and Monufia for three years to evaluate improved crop nutrition, compared with non-fertilized crops, and with the traditional farmer practices. Nutrients were added according to the official state recommendations, which were compared against fertilization based on soil testing.

THE RESULTS:

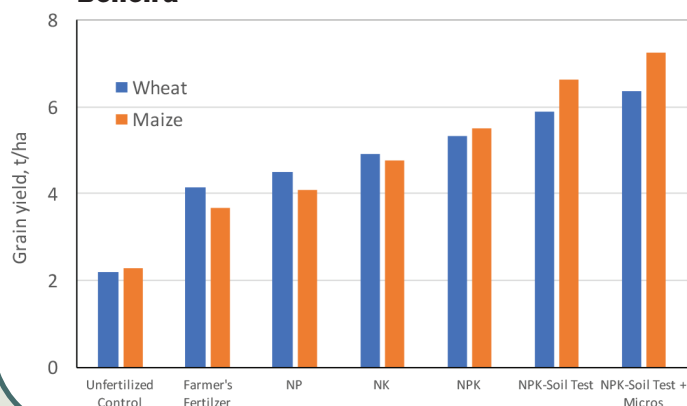
Yields of both maize and wheat were consistently increased with balanced fertilization at the two sites, compared with the other treatments. The addition of micronutrients provided an additional yield boost for both

maize and wheat. The low yields produced in the unfertilized control treatment and farmer practice demonstrate a potential to increase grain production by 30% in Monufia and to double yields in Beheira with balanced fertilization practices.

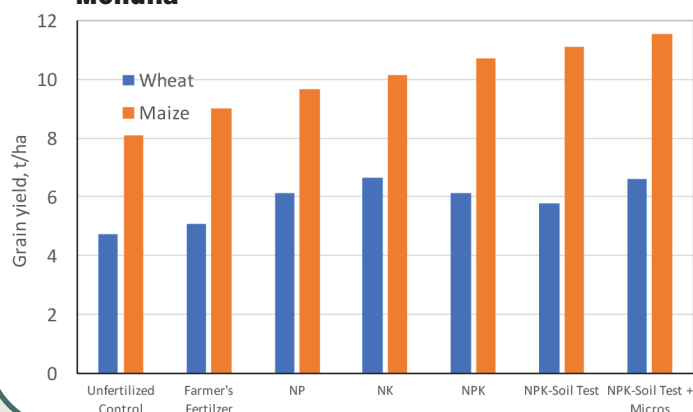
The increased wheat and maize yields from balanced fertilization will directly add to farmers' income and immediately impact the development of the surrounding communities. Improving the rural economy is particularly important since the agriculture sector provides income for more than 50% of the population and contributes to 20% of Egypt's GDP.

This successful partnership between IPNI, the Egyptian government, and the national fertilizer industry helps deliver the message to farmers about the many benefits of proper plant nutrition.

Beheira



Monufia



Maize and wheat yields and farmer profits were consistently improved with a balanced application of nutrients. At these two locations, there was also a positive yield response to the addition of a mixture of micronutrients. Fertilizer application rates were made according to the Egyptian Ministry of Agriculture recommendations or according to soil analysis.



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