

Cropping pattern and nutritional status of soils in Hyderabad district of Pakistan

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Study Area

- District Hyderabad of Pakistan located at 25.367°N latitude and 68.367°E longitude with an elevation of 13 m from mean sea level
- Mostly light to medium soil texture
- Traditional/native cropping pattern and rotation since decades (mono crops e.g., mango in large farms whereas cotton-wheat rotation and intercropping wheat with sugarcane in small farms)

The Problem

- Mining of nutrients by high yielding and intensive cropping
- Soil compaction due to traditional tillage practices
- Improper fertilization and untimely application
- Improper plant residual management

The Approach

- Soil samples were taken from 80 locations at a depth of 0-60cm in Hyderabad district of Pakistan
- Soil samples were analysed for N, P, K, Zn, Fe, Cu, Mn and B
- Interpolated maps for these nutrients were developed applying the Kriging technique
- Interviews were taken from the farmers to correlate the nutritional status of soils with the influencing factors affecting the soil fertility e.g., fertilizer application, cropping pattern and rotation, organic and green manuring and irrigation practices

Results and Discussion

- All the nutrients are below the critical level in most of the study area when interpreted with the international reputed standards. Nitrogen is deficient in 96 % of the soils, potassium and phosphorus are below the critical levels in 95 and 76 % of the soils, respectively
- Organic matter is deficient (when interpreted with standards) in 95 % of the study area
- Low nutrients in the soils are due to a) low organic matter (95%) b) coarse soil texture (>50%) c) and intensive cotton-wheat rotation (>70 %, from the conducted survey)
- Interviews revealed that farmers a) use intensive cropping without any fallowing b) lack awareness about the advantages of legumes in crop rotation c) lack information on proper time/dose and method of fertilizer application d) lack knowledge about Integrated plant nutrient management (combined use of mineral and organic fertilizers)

Conclusions

- To change the cotton-wheat rotation either by introducing intercropping with leguminous crops or growing leguminous crops in between the season to improve the quality of soils by nitrogen fixation and lowering fertilizer leaching
- Balanced fertilizer use and complementary use of organic nutrient inputs with fertilizers are the possible agro-techniques to sustain yield, increase fertilizer use efficiency and to restore soil fertility under intensive cropping
- Making optimum use of irrigation water and protecting soil with most desirable soil amendments and nutrient supply



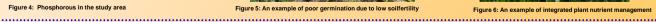
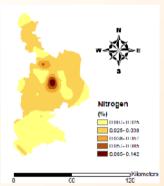




Figure 6: An example of integrated plant nutrient management



Figure 1: Soil series map of district Hydeabad of Pakistan



e 2: Interpolated map for Nitroger

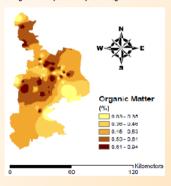


Figure 3: Interpolated map for organic matter

