



Fertilization Unsuitability Index for Assessing Fertilizer Induced Contamination Risk in Soils of Cotton-Wheat System of South Punjab Districts

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Abstract: In this study the fertilization unsuitability index (FUI) has been proposed for estimating soil contamination and nutrient imbalance resulting from fertilizer application at farm source. The fertilizer use data was collected directly from the selected farmers in the study area and interpolated environmental risk resulting from over fertilization was represented in spatial format using Arc GIS software. The results reported that urea was applied more than double the amount recommended for cotton and wheat cultivation whereas the diammonium phosphate was applied at recommended levels in wheat and 50% above recommended dose in cotton in majority of villages in the study area. The average value of FUI was higher in cotton (527.205) in comparison to wheat (491.35) when nitrogen and phosphorus requirement of crops was met by application of urea and diammonium phosphate. Whereas the maximum FUI was reported in Muktsar district (544.52) for fertilization in wheat crop and it was reported to be 536.82 in cotton fertilization. The average soil contamination (SC) risk was higher in cotton fertilization (2.79) than in wheat fertilization (2.47) and the maximum value was reported in Muktsar district for cotton fertilization (3.11). The wheat fertilization practice in the study area threatens only nitrate pollution whereas the fertilization in cotton has associated risks of both nitrate and phosphate pollution in the study area.

Key Words: Fertilization Unsuitability Index, Soil Contamination, Nutrient Imbalance, GIS
