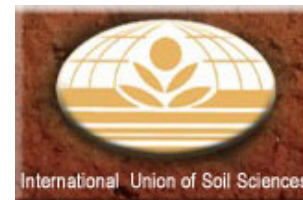




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This presentation is part of [76: 3.3B Nutrient Use Efficiency and Global Agriculture - Oral](#)

Innovations for Improving Productivity and Nutrient Use Efficiency: No-Till Grain Cropping Systems of South America.

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South America is a vast region with large differences in extensive agricultural production systems depending on diverse climate and soil conditions that vary among its ecological regions. Most of the agricultural land is located towards the East of the continent lying on tropical, subtropical and temperate regions. For most of the countries within this area (Argentina, Bolivia, Brasil, Paraguay and Uruguay), the cultivated land and the total crop productivity have increased since the last 2 decades. The purpose of this article is to summarize and to discuss nutrient management for extensive no-tillage (NT) crop production systems in South America. Soybean (*Glycine max* (L.) Merrill), corn (*Zea mays* L.) and wheat (*Triticum aestivum* L.) crops are extensively grown under dryland systems showing a steady improvement in their yields for most of the countries. The introduction of high yielding technologies (selected genotypes, modern pesticides and integrated management practices for disease and pest control, soil conservation practices, and fertilizers) partially explains the change in crop productivity during the last 20 years. The average use of fertilizers increased in all the region since the 70xs to the present. In Brazil and in Paraguay, nitrogen (N), phosphorus (P) and potassium (K) fertilizers are almost evenly used, while in the rest of the region a relative low amount of K fertilizers is applied because of the high soil availability. The use of nutrients for extensive annual crop production in South America follows the increasing requirements because of the agricultural expansion towards new lands (i.e. Cerrado region in Brazil), the replacement of pasture rotated lands (i.e. Pampas region in Argentina and Uruguay), or the improvement in crop yields in almost all the region. Because most of the recommendation practices are based on crop sufficiency criteria, fertilization practices are unsatisfactory for soil nutrient balances in the region and the reduction in soil extractable nutrients is a common issue in all the production systems. Adoption of NT has sharply increased since the 90xs and, currently, it is the dominant crop and soil management practice in almost all the region. This production system contributes to the reduction in soil erosion process, soil organic matter conservation, and the improvement in soil water storage and availability, and it induces changes in soil-plant nutrient dynamics. In general, crop yields under NT practices are more stable than under tilled systems with greater efficiency in the use of nutrients. However, the challenge is a better understanding of the complexity of nutrient dynamics under NT for improving the productivity and sustainability of these systems in environmental and crop production conditions of South America.

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