



RIO18
21st World Congress
of Soil Science

21 WORLD CONGRESS OF SOIL SCIENCE
Sunday 12 – Friday 17 August 2018
Rio de Janeiro, Brazil

Rio de Janeiro August | 12 - 17

Comparing Phosphorus Legacies in Temperate and Tropical Soils Agriculture

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Intensive application of phosphorus fertilizers began at different times and accelerated at different rates both among and within nations and cropping systems. Most nations that successfully increased crop productivity over time also went through a period during which phosphorus inputs to cropland considerably exceeded outputs. The aim of this presentation is to compare countries and cropping systems, both temperate and tropical, for length and degree of such surpluses, in relation to the productivity gains achieved. For example, a cumulative surplus of 30 Tg of phosphorus has recently been reported for Brazil. The ratio of inputs to outputs has shown little change, but owing to increasing cropland productivity, the size of the annual surplus continues to increase. In contrast, in North America and in Europe, cropland productivity continues to increase in spite of declining or stable inputs. How do previous cumulative surpluses in those regions compare with those more recently observed in Brazil? Prospects for future improvements in phosphorus use efficiency may depend on the legacy of past applications, as well as improvement in nutrient application practices and cropping system management for improvement of soil health.



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