

POTASSIUM FERTILITY IN NORTH AMERICAN SOILS

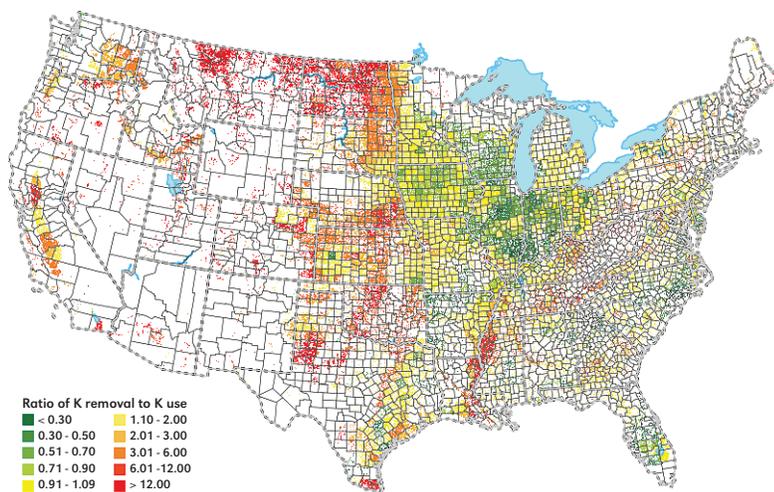
Early this year, the International Plant Nutrition Institute (IPNI) released its fourth soil test summary. Previous summaries were conducted in 2010, 2005, and 2001. The 2015 summary captured information on 7.3 million soil samples analyzed for potassium (K).

The summary is made possible through the generous, voluntary participation of sixty-two private and public soil testing laboratories. For a complete list of participating labs, see soiltest.ipni.net/about/Labs.

In this article, we examine trends in North America and two large regions in the United States: the Cotton Belt and the Corn Belt. For each of these areas, we examine the trends in soil test K as well as the trends in nutrient budgets. Information on nutrient budgets comes from a separate IPNI database called “Nutrient Use GIS,” available at nugis.ipni.net. In this separate database, during the 2001 to 2015 timeframe of the summaries, data were available only for years 2002, 2007, 2010, 2011, and 2012. The amount of K removed with crop harvest was expressed as a fraction of the amount of K applied. Applications considered both commercial fertilizer and recoverable manure. Fractions greater than one

meant that crop removal of K exceeded the total amount of K applied—a scenario of soil fertility depletion.

For North America, soil test potassium levels have been declining during the 15-year period encompassed by the



Map of Potassium (K) removal to K use ratios for the U.S. in 2012. Source: IPNI NuGIS (<http://nugis.ipni.net>)



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“Between 2002 and 2012, crop removal for K was 1.6 times K application in the U.S. Cotton Belt, ... 1.3 times K application in the U.S. Corn Belt and ... 1.5 times K application for North America.”

Virginia. Median soil test levels have been dropping at a rate of 1.1% per year. In 2001, the median K level was 124 ppm. In 2015 it was 102 ppm. During 2002 to 2012, crop removal increasingly outpaced K applications at a rate of 3.2% per year. In 2002, removal was 1.2 times that of application. By 2012, it was 1.6 times as great.

The U.S. Corn Belt was defined as the nine states Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, and South Dakota. Median soil test K levels have essentially remained constant, increasing at a very small rate of 0.04% per year. Median K was 170 ppm in 2001 and 177 in 2015. Potassium removal averaged 1.3 times that of

application during 2002 to 2012.

Trends in soil test levels for these large regions can be very different from the trends of the individual states comprising them. A free, interactive website (soiltest.ipni.net) has been developed to access data on any combination of states and provinces.

More important than any one trend or level is the need to continually monitor the soil fertility status of soils and the crops grown on them. Farmers and their advisers are encouraged to keep soil fertility records up-to-date and stay abreast of new research and recommendations that improve the K fertility of soils and the nutrition of crops.

Visit IPNI's new interactive tool for displaying soil nutrient levels across North America over time at soiltest.ipni.net.