

Tagungsnummer

V166

Thema

Kommission IV: Bodenfruchtbarkeit und Pflanzenernährung

Biogeochemie gekoppelter Stoffkreisläufe (NPK) unter traditioneller Landnutzung

Autoren

V. G. Sychev¹, V. A. Romanenkov², O. V. Rukhovich¹, M. V. Belichenko¹, S. Lukin³, A. K. Sheudzhen⁴, U. Schindler⁵, L. Müller⁵, F. Eulenstein⁶

¹Pryanishnikov All-Russian Institute of Agrochemistry, Moskau; ²Soil Science Faculty, Lomonosov Moscow State University, Moskau; ³Institut für die organische Düngemitteln und Torfforschung,, Vyatkino, Vladimir Region, Russian Federation; ⁴All-Russian Institute of Rice, Krasnodar; ⁵ZALF e.V., Müncheberg; ⁶ZALF e.V., Inst. f. Landnutzungssysteme, Müncheberg

Titel

Monitoring of Soil Fertility (Agroecological Monitoring)

Abstract

Monitoring the ecological status of agricultural land is a fundamental precondition for controlling its sustainable functions for human society and for maintaining the ecosystem's capacity. We analyze fundamentals, developments, and trends and present results of agroecological monitoring in Russia. This system has been developed and operated by the Pryanishnikov Institute of Agrochemistry in Moscow. Agroecological monitoring in Russia was installed in the 1970s and is based on a regular 5-year agrochemical survey of agricultural lands all over the country, more than 300 field experiments in all bioclimatic zones of the country, and more than 1000 reference monitoring plots. In trials with different inputs of fertilizers, the focus is on analyzing soil fertility indicators and their impact on productivity. Some of these experiments are long-term experiments and part of international networks. Their results are of fundamental importance for monitoring, modeling, and controlling the status of soils in future despite climate change. In a regular survey, we found tendencies toward decreasing soil fertility in some regions, for example with decreased contents of humus and plant-available minerals, and topsoil acidification. Nutrient withdrawals must be compensated for by regular fertilization regimes, nutrient mining must be avoided. We detected some gaps in knowledge on the topic of balancing elements and modeling the agroecosystem's response to climate and land use changes. We conclude that there is a need to implement modern measurement and modeling systems in some key long-term trials. The Pryanishnikov Institute has taken responsibility for coordinating running programs in different regions and administrative units of the Russian Federation, and for elaborating methodical guidelines and highly advanced monitoring technologies. National and international cooperation, research programs and networks are key for agroecological monitoring systems of the twenty-first century in addressing challenges for a highly productive, stable, sustainable, and environmentally safe food production.