

Tagungsnummer

V124

Thema

Kommission IV: Bodenfruchtbarkeit und Pflanzenernährung
Biogeochemie innovativer bzw. neuer Landnutzungsverfahren

Autoren

A. Klotzbücher¹, T. Klotzbücher¹, D. Said-Pullicino², S. Schleupner¹, R. Mikutta¹
¹Martin-Luther-Universität Halle-Wittenberg, Bodenkunde/Bodenschutz, Halle; ²Universität Turin, Umweltwissenschaften/Bodenkunde, Turin

Titel

Effects of agricultural management on Si cycling in Italian paddy fields

Abstract

Silicon (Si) is a beneficial nutrient for rice plants; it improves their resistance against biotic and abiotic stresses. Recent research showed that Si availability in soils is, on a large geographic scale, determined by stocks of weatherable silicate minerals. However, also on the smaller regional scale, pronounced differences in Si uptake of rice plants were observed. The reasons for these differences are not yet clear. They might include effects of agricultural management, such as crop residue recycling and irrigation. Here, we test the long-term effects of four different agricultural management practices in Vercelli (Northwest Italy), where one rice crop per year is cultivated from May to September. The experimental platform was installed in 2003 on a Haplic Gleysol known to be under continuous rice cultivation for the last 30 years and having low plant-available Si concentration. The following management practices were considered (i) tillage and crop residue incorporation in spring (ii) post-harvest rice straw burning and tillage in spring, (iii) tillage and crop residue incorporation in autumn, and (iv) tillage and crop residue incorporation in spring followed by dry seeding and delayed flooding. After seven years, in 2010, topsoil and plants were sampled at five points of time during the cropping season. We will examine plant-available Si concentrations in soil and Si uptake by rice. Results will be presented at the conference; they will reveal whether farmers are able to actively improve Si supply to rice plants by their agricultural management.