
Mineralogy of Rhizospheric and Non-Rhizospheric Soils in Corn Fields*

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Abstract: Technical limitations have restricted investigations of rhizosphere mineralogy. Various analytical techniques were applied to assess root-mineral associations and dynamics in natural soils under corn production. Soil samples were collected between four and five weeks after planting and included rhizospheric and non-rhizospheric soils, and undisturbed block samples containing corn root systems. Analytical techniques were applied and included; X-ray diffraction, optical microscope, SEM, EDXRA with SEM, transmission electron microscope (TEM), electron energy loss spectra with TEM, high-resolution transmission electron microscope (HRTEM) and microanalysis with HRTEM. The mineralogy of the rhizosphere differed from that of the bulk soil. Within the rhizosphere, minute platy particles which were mostly vermiculitic minerals, were particularly concentrated near or on root surfaces. These platy mineral particles were not attached to the entire area, but only to certain areas of root surfaces. Therefore, we report quantitative evidence for mineralogical changes in the rhizosphere in soil environments.

Key Words: Corn • Mineralogy • Non-rhizosphere • Rhizosphere

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