EGU24-11099, updated on 18 Jan 2025
https://doi.org/10.5194/egusphere-egu24-11099
EGU General Assembly 2024

Soil fertilization alters spatial and temporal distribution of amino-N in the rhizosphere of maize

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Despite an importance and relatively high abundance of organic N in soil, it is uncertain how the distribution of organic N is affected by mineral N availability in the course of root development. We visualized amino-N content in seminal and lateral roots of maize (Zea mays L.) grown under reduced and full fertilization at the 4- and 6-leaves phases. The intensity of amino-N hotspots was fertilization-, growth phase- and root-specific. Under reduced fertilization, amino-N content decreased in all root parts at the 6- versus the 4-leaves phase. Under full fertilization, the content of amino-N increased in seminal roots and lateral root tips but it decreased in seminal root tips with root growth. This suggests a potential functional differentiation of seminal and lateral root tips in the N-acquisition strategy in the course of plant growth.