Abstract:

Priming effects are fast short-term changes in the turnover of soil organic matter (SOM). Depending on sources of released CO2, priming effects are classified as real (acceleration of mineralization SOM) or apparent (release of CO2 due to accelerated microbial biomass turnover). Mechanisms causing priming effects remain poorly understood. Microbial competition, nitrogen limitation, microbial diversity changes, effect of living roots are the most often mentioned among mechanisms that cause priming effect.

In my thesis I have studied intensity of priming effects in soil from post mining heap that vary in age and SOM content. These soils were affected by addition of substrates with different complexity (glucose, starch and cellulose) in two levels. Addition of 0.2 ml 1.75 % glucose, starch and cellulose solution resulted in statistically significant increase in CO2 release only in one soil. Addition of 0.8 ml 1.75 % glucose, starch and cellulose solution cause significant increase in released CO2 in 3 from 5 soils. Causes of these changes are not clear however in some cases it exceed level of added C could mean real priming effects connected to release already stored C. In soils where organic matter was accumulated on the soil surface and is not mixed into soil was observed the most strong priming effects on the other hand small priming effect was observed in soil where organic matter was mixed into soil. This may imply that soil mixing e.g. by bioturbation reduce priming effect and promote carbon storage.