



Glucose induced priming effect pattern of young and old soil carbon in response to temperature shift

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Soil priming effect (PE) is a short term natural process induced by addition of carbon substrates which change soil organic matter turnover. The available literature indicated that these substances have both increased (positive PE) and decreased (negative PE) mineralization of soil organic carbon depending on the involved mechanism and substrate quality. However, the effect of increasing global temperature on glucose PE is rarely studied and is often problematic. To address this knowledge gap, it was aimed to quantify the PE of ^{14}C labelled glucose at five temperatures i.e. (0, 10, 20, 30, and 40°C) in young and old soil C as an incubation studies for about 130 days. The soil recently shifted (~ 5 years ago) to C4 cultivation from C3 was considered as young soil C, whereas soil cultivated with C3 crop (> 25 years) was considered as old soil C. The ^{14}C labelled glucose was added to respective pots after 38 days of incubation. Soil samples were made from a depth of 10cm during crop standing condition in July, 2014. The results indicated that initially there was almost no PE in young or old soil C at any temperature. Generally, the cumulative PE increased positively with increasing temperature however was not consistent. Specifically, the greater positive PE in younger soil C was observed with 30°C . However, in old soil C, the PE increased with increasing temperature, been higher at 20°C , and thereafter decreased. Older soil C has about 20% higher glucose induced PE than younger soil C. It was concluded that young soil C was more sensitive to higher temperature as compared to old soil C.