SOIL CO_2 EMISSION DURING AND AFTER DIGESTATE SPREADING

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INTRODUCTION

In Italy biogas production represents the most widespread energy source obtained from biomass. The digestate, obtained as byproducts, presents adequate characteristics to be applied to fields as fertilizer. At present few information are available on the effects of digestate distribution on crop response and greenhouse gas emissions.

A research carried out at plot and field scale has been initiated in 2014 to study the CO_2 emission during and after digestate spreading.

METHODS

Spring digestate liquid franction splash plate spreading in a succession of silage maize and winter cereals on soil with different texture (sandy-loam or clay-loam) and different preparatory tillage (ripping or plowing)

Use of digestate solid fraction in an Horticulture system

Use of digestate liquid fraction to produce agro-energy perennial and annual no-food crops
Arundo donax
Miscanthus x giganteus
Zea mays
Sorghum bicolor
Heliantus tuberosus
Lolium perenne

FIRST RESULTS

First field results, after 24 hours digestate spreading, shown a significantly higher CO_2 flux emission peak comparing with no-spreaded soils. Spring digestate distribution, in the first 340 hours promoted higher average CO_2 emission from sandy-loam soil than clay-loam one with respectively 4.4 ± 6.8 and 1.1 ± 1.7 CO_2 g m^{-2} h^{-1}. No significant effect on CO_2 emission was detected in relation to soil tillage techniques.

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