INTRODUCTION
The aim of this study is to quantify the potential environmental impacts of ploughing carried out with 3 tractors belonging to different emission Stages for the control of pollutant emissions produced during engine combustion.

METHODS
A cradle to farm gate perspective was applied: the system boundary includes the production of inputs consumed during ploughing and the related emissions. The Functional Unit is 1 ha of soil properly tilled. Inventory data were measured for fuel consumption during the three ploughing trials and for urea solution consumption in tractor B. Engine exhaust gases emissions were quantified by referring to the emission limits of the Stage of belonging as defined by EU Directives.

RESULTS
Tractor C has the worst environmental performance on all impact categories. Regarding the best solution, instead, not univocal results are obtained, mainly because of engine and operative characteristics of the tractors. The worst results for tractor C are related to the categories mainly affected by pollutants emissions. For CC and OD the impact is very close for all the 3 cases due to the similar fuel consumption, especially of tractors A and C. The best outcomes are achieved for 7 of 12 impact categories by tractor B. On HTnoc, HTc, FE, FEx and MFRD tractor B behaves worse than tractor A because the SCR consists of a more complex system that involves a substantial increase in the tractor mass.

CONCLUSIONS
Urea solution has a negligible impact but its use involves important and efficient environmental benefits for pollutants emissions.