The Direct Costs for Cover Crops Cultivation: Comparison between Different Agronomical Practices

Calcante A.\*, Manenti D., Oberti R.

Department of Agricultural and Environmental Sciences, Università degli Studi di Milano. Via Celoria 2, IT-20133, Milan (Italy)

aldo.calcante@unimi.it, phone: +39 0250316864

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**Abstract.** As it is known, cover crops are plants that cover the soil between the harvest of the main crop and the seeding of the later. They are herbaceous species that are not cultivated for their commercial value, but to obtain agronomical and environmental benefits. These species are inserted in the production processes with the primary aim to maintain soil covered by vegetation in periods when the same soil would remain lacking in every cultivation, and therefore subject to damaging effect from pedological point of view.

The limits of cover crops are due to their nature. Indeed, since they are crops which do not have a commercial value, the most significant aspect is related to their production costs therefore the incidence of costs for the purchase of seed, for seeding and for the termination must be limited.

In particular, scientific literature is poor of studies related to mechanization cost analysis for cover crops cultivation. For this, the goal of this study is to experimentally evaluate and analyze in details the fuel consumption, the main operative parameters (i.e. workability and hours necessary to carry out every single mechanized activity per hectare) and costs per unit of area for fuel, labor and agrochemical required for the cover crops cultivation, as a function of different agronomical practices applied. In particular, the study takes into account the following agronomical practices: 1) conventional tillage, 2) minimum tillage, 3) direct seeding and 4) no-tillage and, to destroy cover crop, the mechanical and the chemical termination.

The obtained results suggest that the conventional tillage is the most expensive agronomical practice in terms of fuel and labor (€/ha). Minimum tillage allows a saving of 40.4% in comparison to conventional tillage, whilst direct seeding and no-tillage allow a saving of 75.4% and 69.0% respectively, always in comparison to conventional tillage.

It follows that the most convenient and timely techniques are direct seeding and no-tillage. About cover crop destruction, results demonstrate, in absolute terms, that chemical termination is the timeliest operation, but is not the most cost-effective choice since, to direct costs, must be add the cost of the herbicide. The more convenient termination is that carried out using crimper rolling, but this technique is only apply to a small number of cover crops with a well-defined phenological stage.