



Root characteristics of cover crops and their erosion-reducing potential during concentrated runoff

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In the loam region in central Belgium, a lot of research has been conducted on the effects of cover crops for preventing splash and interrill erosion and on their nutrient pumping effectiveness. As this is a very effective erosion and environment conservation technique, planting cover crops during the winter season is widely applied in the loess belt. Most of these cover crops freeze at the beginning of the winter period. Consequently, the above-ground biomass becomes less effective in protecting the soil from water erosion. Apart from the effects of the above-ground biomass in protecting the soil against raindrop impacts and reducing flow velocities by the retarding effects of their stems, plant roots also play an important role in improving soil strength. Previous research showed that roots contribute to a large extent to the resistance of topsoils against concentrated flow erosion. Unfortunately, information on root properties of common cover crops (e.g. *Sinapis alba*, *Phacelia tanacetifoli*, *Lolium perenne*, *Avena sativa*, *Secale cereale*, *Raphanus sativus* subsp. *oleiferus*) is very scarce. Therefore, root density distribution with depth and their erosion-reducing effects during concentrated flow erosion were assessed by conducting root auger measurements and concentrated flow experiments at the end of the growth period (December). The preliminary results indicate that the studied cover crops are not equally effective in preventing soil loss by concentrated flow erosion at the end of the growing season. Cover crops with thick roots, such as *Sinapis alba* and *Raphanus sativus* subsp. *oleiferus* are less effective than cover crops with fine-branched roots such as *Phacelia tanacetifoli*, *Lolium perenne* (Ryegrass), *Avena sativa* (Oats) and *Secale cereale* (Rye) in preventing soil losses by concentrated flow erosion. These results enable soil managers to select the most suitable crops and maximize soil protection.