



## **Use of commercial soil amendments in initial soils (I) - Impact on yield and basic soil characteristics**

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Large-scale disturbances induced by mining of mineral resources (e.g. lignite in Lusatia, Germany) calls for the search of recultivation techniques related to nutrient-poor substrates that can promote plant growth under dry and unfavourable conditions. Two commercial soil additives (CSA) which are synthetic-mineral (CSA 1) and organo-mineral (CSA 2) mixtures of recalcitrant organic compounds with nutrients, were tested for positive effects on the organic C-stocks, yield and root biomass compared to the optimal tillage strategy. Trials with CSAs and rotary spader under monoculture and also in crop rotation were tested over two years from 2007 to 2008. Implementation strategies were tested on changes in substrate density under monoculture (*Dactylis glomerata*, L.) in comparison to trials with rotary spader, milling cutter and disc harrow to no tillage.

Most effects in C-stocks and root formation were restricted to the top 10 cm layer. In 2007, CSA-1 induced significant positive effect on organic C-stocks and harvest during the initial phase of implementation, and shows no difference in harvest yield in the following year of investigation. In the second year, organic C-stocks in CSA 1 have a reverse effect in comparison to the control trials. The CSA 2 produce initial tend affect on root biomass in 2007. This recent biomass in the second year of investigations increases significantly organic C-stocks in the treated soil in comparison to the control. Trials with CSA 2 show a trend to increase yield harvest to control under monoculture as well as in crop rotation.

Soil density was not affected by the usage of rotary spader, but increased with disc harrow and decreased significantly with milling cutter. Milling cutter favoured yield. The CSA 2 reduced soil density with rotary spader in contrast to CSA 1. The positive effect of CSA 2 is most likely due to the stimulated root growth. We concluded positive effects of CSA 1 and CSA 2 alone and in combination for long-use positive effects on reclaimed sites.