



At one of the sites in our long-term soil fertility experiments (started in 1957), Orup, the subsoil is compacted (density between 1.7 and 1.9 kg L⁻¹). The soil is a silty sand and the compaction is most likely from the time the ground was formed, i.e.

it has a natural origin. The harvests for this site have remained much lower than at the other soil fertility experiments, approx. 30-40% lower.

In spring 2011, an inventory was made in Orup with regard to root growth in the subsoil. The results showing the same results as in previous studies in the 1990s: the roots of the crop is restricted to the topsoil and no roots grow below 30 cm depth. A structural improvement through liming is limited at Orup due to a low clay content (about 10%). In lighter soils such as this, a structural improvement can be achieved primarily through the supply of organic matter. Therefore, we will investigate the possibility of improving soil structure through the supply of organic material in combination with a mechanical subsoil loosening. The supply of organic material is made in the form of straw pellets that are blown into the ground.



Stakeholder meeting in May 2017 and voting with “post-it” stickers. Four general categories of SICS were judged according to recommended criteria; sustainability, profitability and fit to the system. Subsoil loosening got most of the votes, with a preference for subsoil loosening plus straw incorporation.



Some previous experience:

In a field experiment on a clay soil outside Uppsala, the effect of deep loosening in combination with injection of slurry made from cereal straw was studied. This treatment gave a 5.6% increase in yields of spring wheat, and 4% due to loosening only.

Getahun et al. (2018): Short-term effects of loosening and incorporation of straw into the upper subsoil on soil physical properties and crop yield. Soil Till. Res., accepted manuscript.



The “HE-VA sub tiller” equipment that will be used for the subsoil loosening is owned by Tommy Ingelsson. In a meeting in March 2018 an agreement was made with him to adapt the equipment, the land owner of Orup and Hushållningssällskapet in Skåne (The Rural Economy and Agricultural Societies), who will perform sowing, weeding, harvesting etc.

1	2	3	4	5	6
A	C	B	A	C	B
7	8	9	10	11	12
C	B	A	A	C	B

The desired depth for subsoil loosening is 40 cm. The amount of straw pellets should compare to 25 ton ha⁻¹ and the treatments accomplished in autumn 2018, probably in the first week in September. The field experiment, placed beside the ordinary LTFE, will be a block trial with 4 replicates and 3 treatments. The plots will be 6 × 20 m = 120 m², with cultivation occurring within 4 m width with 28 cm between rows.

- A** = control (no subsoil loosening)
- B** = subsoil loosening
- C** = subsoil loosening + straw pellets

The SOILCARE project is a 5 year project aimed at identifying and evaluating promising soil improving cropping systems and agronomic techniques increasing profitability and sustainability across scales in Europe.

The SOILCARE project consortium consist of 28 partner institutes from 10 European countries. The SOILCARE project is coordinated by ALTERRA, Wageningen UR, The Netherlands.

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