

SoildiverAgro project

Adoption of new management practices to increase crop production and quality



THE WHAT AND WHY

Tillage without soil compaction

Tillage can damage soil structure, but this can be avoided with the right techniques. Managing when to till, avoiding soil sloughing, and controlling compaction from tractors are key elements for reducing damage from tillage.

Tillage applies mechanical energy to change soil structure. The effect on soil depends on soil moisture. A wet soil doesn't shatter, but deforms, like dough or putty. A slightly drier soil crumbles and at the right moisture does it very easily. A very dry soil requires huge amounts of energy to break. Tilling at the optimum moisture can result in the desired change with the least energy consumption. This can be evaluated with a "mini tillage experiment": taking a clump of soil and rolling it between the hands to see the friability. Done at different depths, this can give a good indication to which depth the soil can be tilled without unnecessary deformation.

Tillage also results in unwanted changes to structure: soil aggregates are broken up and erosion prone material is brought to the surface. Covering the soil after tillage allows time for the soil to regain stability and to build aggregates. The cover can be plant residue or cover crops. Cover crops have the additional benefit of drying the soil, which creates fractures and help in aggregation.

In many cases, the tractor does more damage than the tillage tool. Dual wheels and trailed implements help to reduce wheel load, while modern high flexion tyres allow lower tyre pressures. The rule of thumb is that when moving over optimally friable moist soil, 0,5 bar tyre pressures should be used. If low pressures are not an option, moving to permanent tramlines (CTF, controlled traffic farming) protects most of the soil from compaction



1. A light tillage tool and a lot of wheels result in low stress for the soil.

KEYWORDS

Tillage, soil compaction, soil management, tyres

AUTHORSHIP

Tuomas J. Mattila, Kilpiä farm, Pusula, Finland



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