

# Soil compaction: Feeling the pressure?

## Practical Guide for crofts and smallholdings



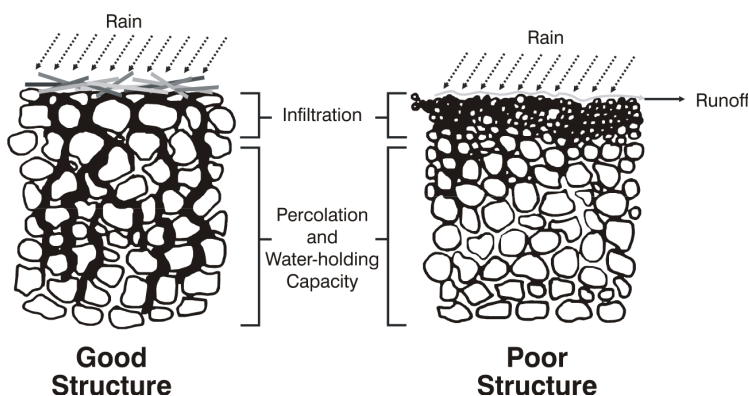
**Farm  
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### What is compaction?

Soil compaction is the consolidation of soil particles as a result of animal or vehicular traffic. Soil compaction is not just a problem for arable farms; it causes problems for crofts and small farms with livestock, at gateways and on cropped fields.

### Effects of compacted soil layers

- Restrict movement of water/air/nutrients
- Prevents good root development
- Impedes drainage
- Increases release of nitrous oxide
- Reduced nutrient efficiency



### Impact of soil compaction

- Poor plant growth
- Lower yields
- Poorer utilisation of fertiliser
- Increased runoff and ponding
- Increased anaerobic conditions
- Increased soil erosion
- More greenhouse gas emissions

### Identifying compaction

- Dig a hole! Use a spade to dig at least 30 cm deep and examine for:
- Blocky platy vs crumb structure
- Horizontal layers (hard pan)
- Poor root penetration and roots running horizontally
- Lower earthworm populations
- Grey mottling—a sign for lack of oxygen due to waterlogging and drainage problems
- Use our Visual Evaluation of Soil Structure method (see FAS website: VESS)



## Types of compaction

- Animal trampling affects the upper layer of the soil (0-10 cm)
- Mechanical compaction – much heavier and effects of compaction are further down the soil profile (0-20 cm)



## Prevention is better than cure

- Know your soils
- Stay off wet soils
- Clean our ditches & sort drainage issues
- Wet fields
  - Avoid poaching and/or rest/graze with sheep/ young stock
- Outwintering – minimise poaching
- Reduce weight of machinery on fields
  - Minimise loads, remove weights, use light machines, use more axles
- Reduce ground pressure
  - Wider tyres, low inflation pressure
  - Tandem or dual wheels
  - Tracked vehicles
  - Specialised low ground pressure machines
- Choose crop to suit your soil type
- Avoid uphill operations

## Remedial action

The challenges are:

- You must use the right treatment
- Only undertake remediation work when the soil is dry
- Working under wet soil conditions could potentially lead to increased compaction and smearing



## Remediation and working depths

Type	Typical working depth
Aerators, i.e. spiking or slitting	0 – 15 cm
Sward lifters top-soilers	15 – 35cm
Sub-soilers	35 – 50 cm

## Tyres: increase the footprint—reduce compaction

- Find more information in the practical guide: Tyre Selection & Management (Farming for a Better Climate)

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