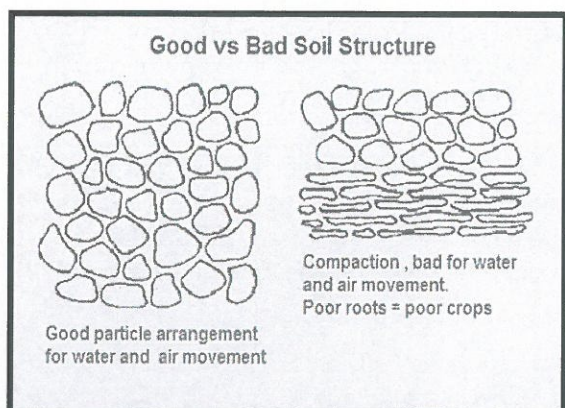


## Cost of Compaction



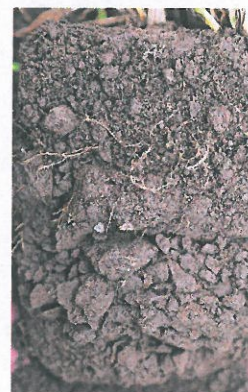
### Yield

Mild soil compaction causes:

- Poor root growth
- Reduced fertiliser recovery
- Increased nitrogen loss
- Yield loss of up to 15%

**Cost of buying in silage to replace lost yield on 10 ha = £1050 (10 ac = £425)\***

\*loss 1.5 tonne DM /ha on a sward with yield potential of 10 tonnes DM /ha silage at 35 % DM £25/tonne



Plough pan

### 1. Reduced response to nitrogen

- Soil compaction can halve the response to applied nitrogen from manure and fertiliser, doubling the cost of nitrogen/kg!

### 2. Poor sward quality

- Soil compaction can increase the proportion of secondary grass species and weeds, which have lower energy than ryegrass.
- Buying compound feed to replace 1 MJ energy will increase annual bought-in feed costs by £66, £26 and £4.40 respectively per head for dairy cows, growing beef and lambs per year.

### 3. More frequent reseeding

- Soil compaction reduces sward quality leading to more frequent reseeding to maintain yield and quality.
- Reseeding after 5 rather than 8 years will increase costs.
- Reseeding every 5 years to maintain sward quality on compacted soils increases reseeding costs by around £38 /ha/year.

### 4. Reduced earthworm activity

Soil compaction reduces the number of earthworms. In a healthy well-structured soil earthworms can:

- Supply 25 kg N /ha/yr worth £20 /ha (£8 /ac)
- Increase organic matter turn over by 200-300 %
- Increase water infiltration rates 10 fold
- Reduce run off by 50%
- Form new soil (worth between £3 and £15 /ha/yr (£1.21 and £6.07 /ac/yr) on PROSOIL Commercial Development Farms)

### Reducing the effects of compaction

- Aim to prevent compaction wherever possible (see Bryngwyn case study, pp. 10-11)
- Assess soil: "Dig, Handle, Measure" (p. 42), especially where there are lots of weeds, bare ground or if grassland is not performing
- Check soil for signs of compaction:
  - a) horizontal cracking
  - b) roots growing sideways
  - c) stale unpleasant smell
  - d) orange or grey mottles
  - e) blocky aggregates of soil which do not break under pressure of forefinger and thumb
- Consider using machinery when the soil is dry enough
- Management methods chosen by PROSOIL Commercial Development Farmers to improve soil structure included liming (£60-£75 /ha or £24-£30 /ac), spiked aeration/sward lifting (£60-75 /ha or £24-£30 /ac), subsoiler/vibrating aerator (£130-150 /ha or £52-60 /ha), and multispecies ley (£500 /ha or £202 /ac)