



Food and Agriculture  
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Department  
for Environment  
Food & Rural Affairs

# Practical strategies for managing soil health in temperate agricultural systems

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## International Plant Health Conference



# Threats to agricultural soils

## Compaction:

- Livestock and machinery



## Erosion:

- Bare ground and compaction



## Loss of organic matter:

- Soil disturbance and lack of inputs to cultivated systems



# Impacts of poor soil quality

- Lower yield (typically 10-20%; up to 100%)
- More uneven crop
- Higher weed/disease pressure
- Poor drainage
  - Reduced timeliness (machinery work days)
- Increased fuel use: 50%+
- Gross margins ↓ £600-£1,200/ha or 15-30%
- Increased risks of erosion and surface runoff



(Balshaw *et al.*, 2014; Hallet *et al.*, 2012; Mouazen & Palmqvist, 2015)

# Preventative measures

## Keep stock off wet ground:

- Manage turn out times and stocking rates
- Move feeders regularly



## Machinery:

- Balance and ballast machinery to reduce wheel slip
- Low ground pressure tyres
- Reduce the trafficked area (CTF)



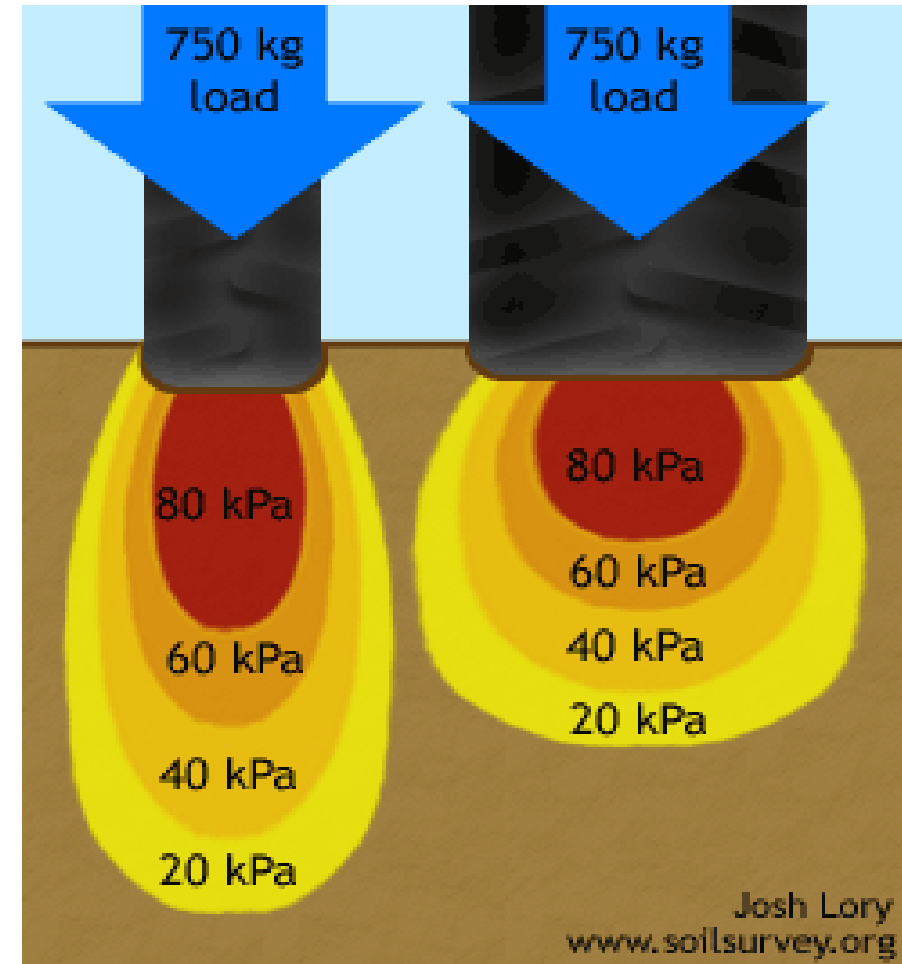
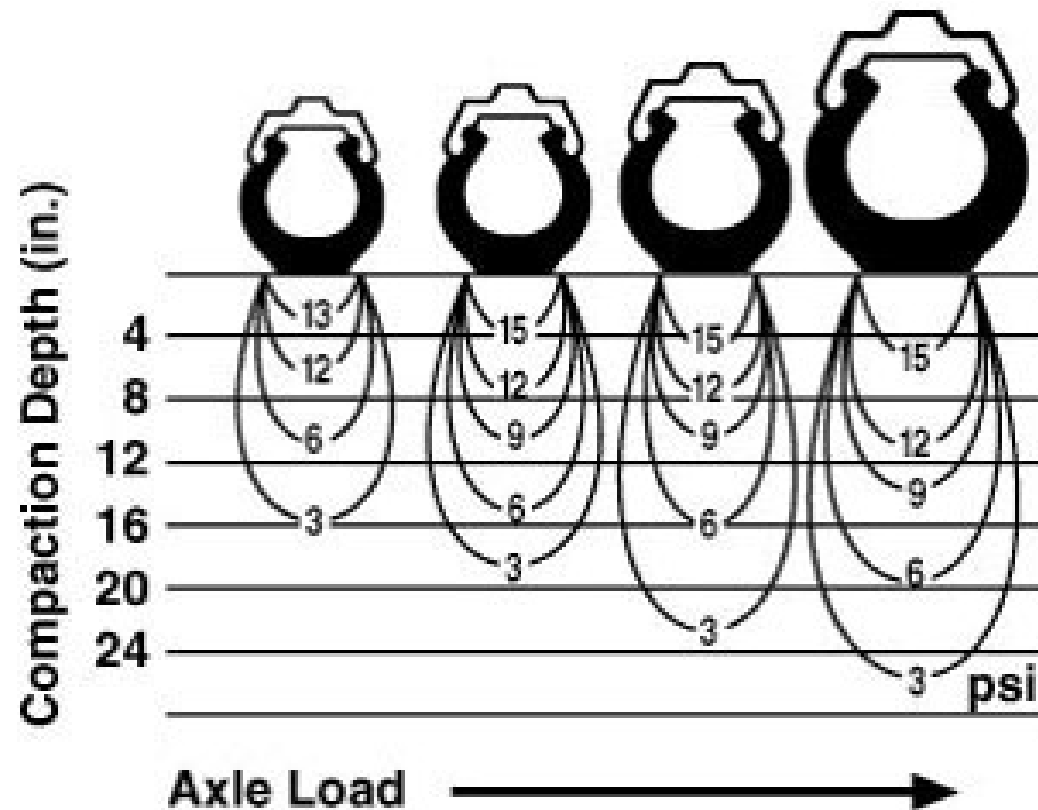
## Rotation & crop choice

- Minimise bare ground
- Cultivation timing



## Enhance soil organic matter levels to build resilience

# The effect of axle loading and tyres on compaction





# What can we do to maintain/increase SOM?

Defra project: SP08016  
(2009)

## Croplands:

1. Introduce rotational grass
2. Apply organic materials
3. Use cover crops/green manures; incorporate residues
4. Adopt reduced/zero tillage
5. Reduce soil erosion

## Grasslands:

1. Don't disturb!
2. Apply organic materials
3. Reduce soil erosion
4. Grazing management?
5. Increase diversity of sward?



# How to assess soil health – an integrated approach:

## Chemistry:

- Soil analysis – pH, P, K, Mg

## Physics:

- Soil examination – dig holes
- Compaction, colour, smell

## Biology:

- Soil organic matter
- Earthworm counts



# AHDB Soil Health Scorecard

Comparison categories	Soil health scorecard indicators			<div>Investigate</div> <div>Review</div> <div>Continue rotational monitoring</div>
	Physical	Chemical	Biological	
Region (rainfall class)	Visual assessment of soil structure (VESS) most limiting layer	pH, Ext. P Ext. K Ext. Mg	Earthworm count SOM (Microbial activity)	
Rotational cropping				
Topsoil character				

- Tested at long-term experimental sites and with farmer groups; used on AHDB Monitor and Strategic farms
- Video ‘walk through’, benchmarks and guidance
- [www.Testing the soil health scorecard | AHDB](http://www.Testing the soil health scorecard | AHDB)





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**Thank you for listening**  
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