



Agronomists' Induction 2019

# How to measure the impact of soil management practices using a soil health scorecard

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# GREATSOILS



# Integrated programme of research and knowledge exchange

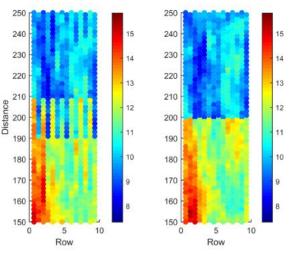


NFLTRATION TEST

\*\*No 027/027

- Rotations
- Cultivations
- Compaction
- Organic matter
  - Soil nutrients
  - Cover crops
  - Soil biology
  - Soil health
- Precision farming





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### Testing soil health



- Develop a fire-year and health tenting action plan for year family
- Bo clear on the page one for repring and health Prioritize Gods for soil health testing.
- superiodly sell-are memory and time and include Compare the best performing hard sever with
- the mind pollumning of their margins
- Otocos coliphysical, chemical and biological
- Keep good records to track changes in soil

## tricts based a lettle or air practices and non

#### Why has not bearing

A Beld's soil health can often be improved and many. tomers and growers consider adopting new approaches to acryone these improvements.

When prairing region changes to a production system (by a mounts executed thogo systems, as trossessed use of composite, green manures and cover crops, rentrosuction of rivededs or incorporation of coop recipies), it is particularly important to eather cook passive data on not booth

By desting a range of cot physical, oberatos and prological properties, a good oversal picture of now They affect the productions of the band out be obtained. Over time, baseline information can be used to make

Most six nerthinisms toll us?

napara. the currently use tright to be exclusive and High trenders of earthwerens retuple the

policetor for supolity of negative to your

The presence of each ecilingical group initialize the potential for painting regimes benefits, buch as carbon cooling, national mobilization and/or mater officialize.

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How to count earthworms

Earthwood improve your productivity pre-processy explorable for engineering the sock environment and use so reported from source for native birds over the buring truck. There are up to 10 contents and review species in apricultural solls and flower purclas prospect riter these ecological speci, ecoperi, prologero and areasi, postreome - each greap having a unique and important tracking. Epitherman are an indicate of antheads, being imposted. by plit, subselegating, companion, bilaye, relation and

#### How to intentity wartingcome.

#### Excess from therefore surfacement

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- Rehydros to: Titige Saltrownia) and organic regitor reprogressif such so mesure populations (beneficial Bribale Coalises cycling analysmy for cubus binds

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#### Soil assessment methods



Many farmers and primers are introduced about the health of their stells. They understand the importance or soot factor, for the productions, materialistics and professing of that husbners, but many face agriftment shallenged when integrating results from information entryle or when choosing suitable wether for assessing the health of colle beyond the standard pH, presphose (P), potassion (K), regimeter (Mg analysis). To be of value to farmer, and govern, methods for solf

ensembers this drives only insense not health. But they should also provide information that can be used to Horn diabetes railing it salution to self-repagament This factorises provides an overview of the various

#### Allow for to crossobil

The functioning of est departitioners a complex Pharacters between organisms large and exist, ohersoon exempts to collidate and on surfaces of May partition, of within a obscious occurrence by natural processes and monthed by antimenogenesis.

A broad range of augmentate indication of sell-health are flushing model in evolute the effects and continued by at agreement produces. The most community agreed and award indication can be grouped in the first cologoption of (1) biological, (2) of writing and (3) physical commence.

During a series of regional accountation assertings or authors 2015. Nursicolated growers in Seets Birtain discounted different approaches to and authorizent methods they found useful and reasons why others were not contributly used. Growers road the neighbots and the results are given received.

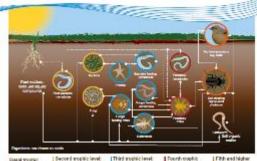
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### The soil food web

Novembrook of assessing solls are available.



#### Daniel Trophyc

Classification of the control of the

## Second mophic level:

## Third prophic level: Fourth trophic

trophic levels

### figure 1. Notabendry between organic matter deconscious and the lyses of monorganisms and animals within the outload mate. Department as substituted according to either than bed to line regarding on where releases.

#### Completely of their coll

Solid contain a very high diversity of organisms. These solirepresentational and resource for any facilities for indicate physical properties of the boil to crive soil processes.

So to transit inceledge about the physiology and anytomiseral inquirement of individual tracks in many cases, it is often convenient to consider soil organisms in beneficial groups, i.e. by the rate. Buy placered presence. they carry out.

Each species in a functional process does a similar lob and so tep similar impacts on community or eccovaries processes. for occurrate, we can group regetter at intergen-foring involved of word clarge forgs, of his dark. Landing remsedes; or all ventus iburtowing (anects) earthwome.

#### What's wall no take?

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#### Soil structure and infiltration



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#### Action power

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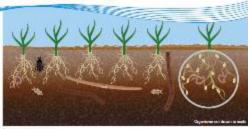
der increases in the interests of single-step resided women

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#### TACTORECT

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## Introduction to soil biology



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## ag carrier, ting, value.

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- Management and their should straight with material affect plant health and/or product/vity in either a paradica, resultati pe impelescimos.
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### Step one: Surface assessment

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## Step two: Sail extraction

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## Step three: Soil assessment

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### Step four: Soil scoring

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# Why is soil management important?

**Discussion** 



# All soils are different



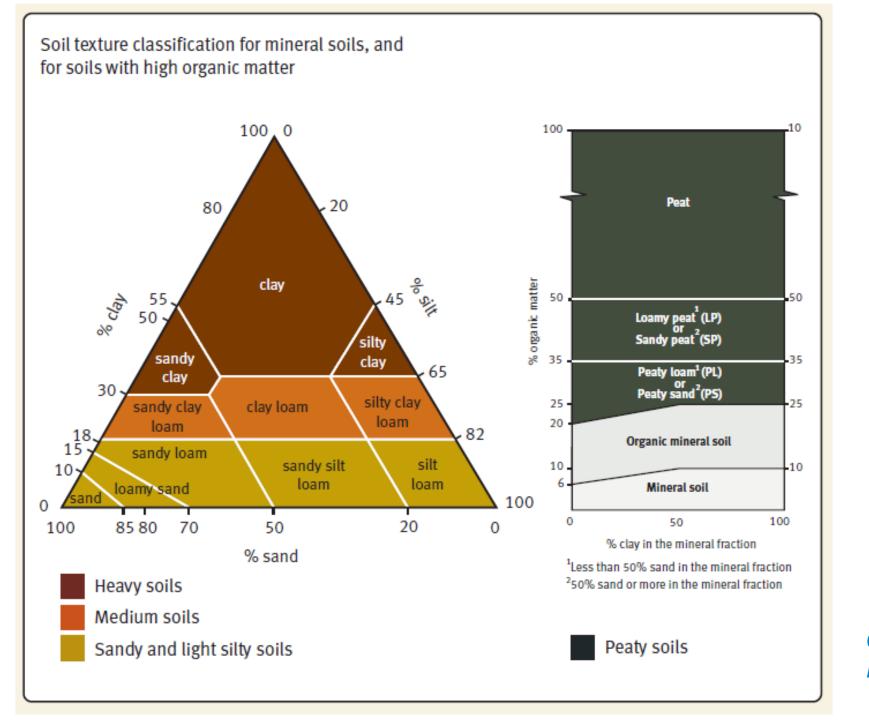














Credit: Think Soils, Environment Agency



## **Physical**

- Texture
- Structure
- Drainage

## Chemical

- pH
- N, P, K, Mg
- Minor nutrients

## **Biological**

- Earthworms
- Soil food web
- Microbiology



# Soil health scorecard approach

Developing indicators for measuring and monitoring soil health



Attribute*	Field A; Farm 1	Field B; Farm 2	Field C; Farm 3
SOM (%)	3.4	2	2.2
рН	6.7	6.9	7.0
Ext. P (mg/l)	40.6	59.6	37.2
Ext. K (mg/l)	158	106	148
Ext. Mg (mg/l)	82	89	144
VESS score	2	2	2
Earthworms (Number/pit)	13	8	1
Investigate	Monitor	No action needed	



# Improve soil health by

- ✓ Increasing organic matter inputs
- ✓ Increasing rotation (length and diversity)
- ✓ Reducing tillage intensity, where possible









# Breakout session

Soil management issues on farm



## Scenarios

## Points of discussion

- What is the issue?
- What might have caused it?
- What could be done to alleviate it?
- What information do you need?

## Roles

- One AHDB facilitator per group
  - Help group keep on track
  - Manage time
  - Not to provide answers!
- One delegate to capture ideas
- One delegate to feed back at end



# Group feedback

Soil management issues on farm



# Farm A





# Farm B





## Farm C





# Farm D





# Farm E





# Practical look at soils

Soil types and scorecards

Soil biology















