

Presentation by CA-UK



A Decade+ of

Conservation Agriculture



**minimum / no soil
disturbance**



**plant diversity/
crop rotations**



**continuous cover
residues/cover crop**

Tony Reynolds (Farmer)

- We have 3 farms in the East Midlands UK.
- Home Farm 250ha.
- Burton Farm 405ha.
- Wheathill Farm 595ha.
- Total Hectares 1250.
- 100ha pasture feeding 150 beef cattle.
- 16,000 hen egg unit (free range).

**“It can be said with considerable truth
that the use of the plough has actually
destroyed the productiveness of our
soils”**

-

-

**“There is nothing wrong with our soil,
except our interference”**

Edward Faulkner

From the ***Ploughman's Folly*** (1943)

Why Conservation Agriculture?

My Grandfather worked this land with a horse.

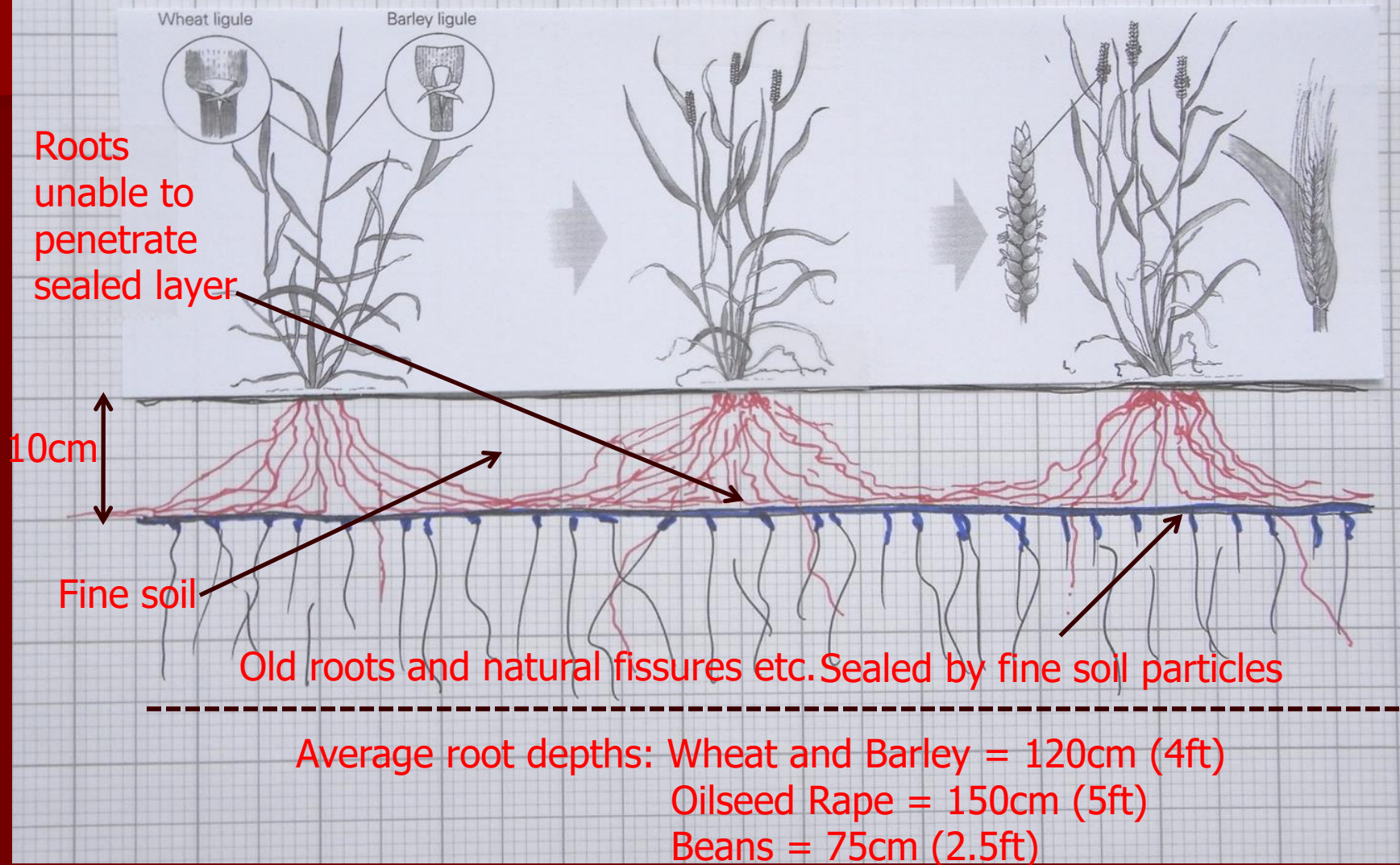
What has modern farming done to the soil?



And Again



Min-Till at 10cm



Target Rotation

- 40% 1st Wheat
- 20% 2nd Wheat
- 20% Oilseed Rape
- 20% Spring Cropping:

Oats
Barley
Wheat
Beans

- Cover Crops:

Phacelia
Canary Seed
Mustard
Clover
Vetch

No-Till Drilling

Great Plains

Bertini



Sulky



Weaving



John Deere



Väderstad



Seed Planting



C.A in Moldova



14/15 Season

Date Drilled: 27th September

Date Photographed: 14th October

Wheat after Beans



14/15 Season

Date Drilled: 16th September

Date Photographed: 14th October

Wheat after Oilseed Rape



14/15 Season

Date Drilled: 28th September

Date Photographed: 14th October

Wheat after Wheat



Spring Drilling '14'

Spring Beans



Spring Oats



36th Wheat Crop



Combining



Deeping Annual Ploughing Match



Thurlby Grange Farms: 2014
2015

Establishment Cost Comparisons

£ sterling per hectare

Process	Traditional	C.A	Auto-Cast Oilseed Rape
Sub-soil	59	0	0
Plough	55	0	0
Disc	40	0	0
Spring Tine	23	0	0
Power Harrow	44	0	0
Drill	30	30	0
Roll	15	0	0
TOTAL	266	30	0

(Traditional) John Nix '2014'



Diesel Fuel Usage

Year		Litres per Hectare
04/05	Sept/Sept	96
05/06	Sept/Sept	91
06/07	Sept/Sept	49
07/08	Sept/Sept	46
08/09	Sept/Sept	42
09/10	Sept/Sept	44
10/11	Sept/Sept	43
11/12	Sept/Sept	42
12/13	Sept/Sept	43
13/14	Sept/Sept	41

Total Consumption all operations on 1250ha of arable.



Reducing the initial impact of CA

Year		Seed Rate	Fertilizer Kg (Check RB209)
1		As Standard for the farm	As Standard for the farm
2	Light: Medium: Heavy:	No Change +5% +10%	No Change +8% +10%
3	Light: Medium: Heavy:	+5% +10% +15%	+5% +10% +12%
4	Light: Medium: Heavy:	No Change +5% +10%	No Change +8% +10%
5	Light: Medium: Heavy:	No Change No Change +5%	No Change No Change +8%
6		Back To Standard	Back To Standard

Yields

- We have found over the last few years that the higher the clay content of the soil the longer it takes to show the benefits of C.A.
- Again given light or silt type soils no yield loss necessarily occurs.
- Some land for no apparent reason changes in a couple of years.

The effects of Conservation Agriculture on our soil.

Potassium Map

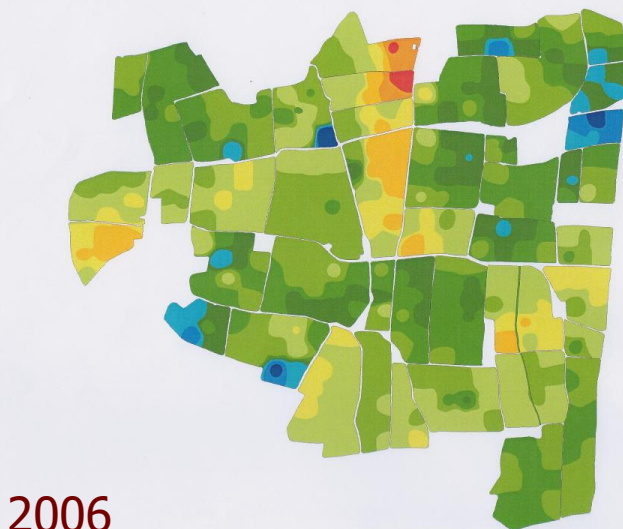
-No 'K' added in last 8 years

2014



Potassium Nutrient Level Whole Farm Map

Burton Lazars Farms, Burton Lazars Farms



2006

Scale metres

0 240 480 720 960

PPM

0 20 40 60 80 100 120 160 200 240 294 347 400 600 900

Level Index

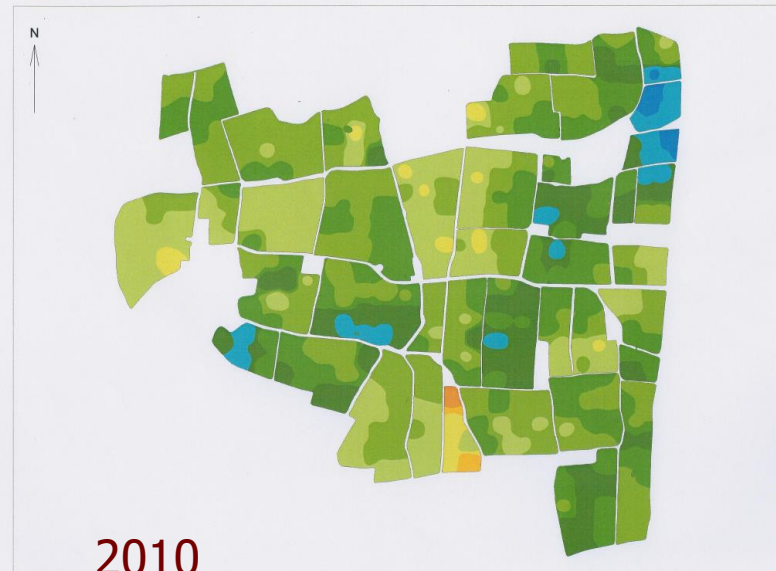
0- 0 0+ 1- 1 1+ 2- 2 2+ 3- 3 3+ 4 5

SOYL PRECISION FARMING

Sampled 27/04/2006
Ref: SY456
SOYL Ltd. (c) 2010

Potassium Nutrient Level Whole Farm Map

Burton Lazars Farms, Burton Lazars



2010

Scale metres

0 240 480 720 960

PPM

0 20 40 60 80 100 120 160 200 240 294 347 400 600 900

Level Index

0- 0 0+ 1- 1 1+ 2- 2 2+ 3- 3 3+ 4 5

SOYL PRECISION FARMING

Sampled 06/03/2010
Ref: AC698
SOYL Ltd. (c) 2010

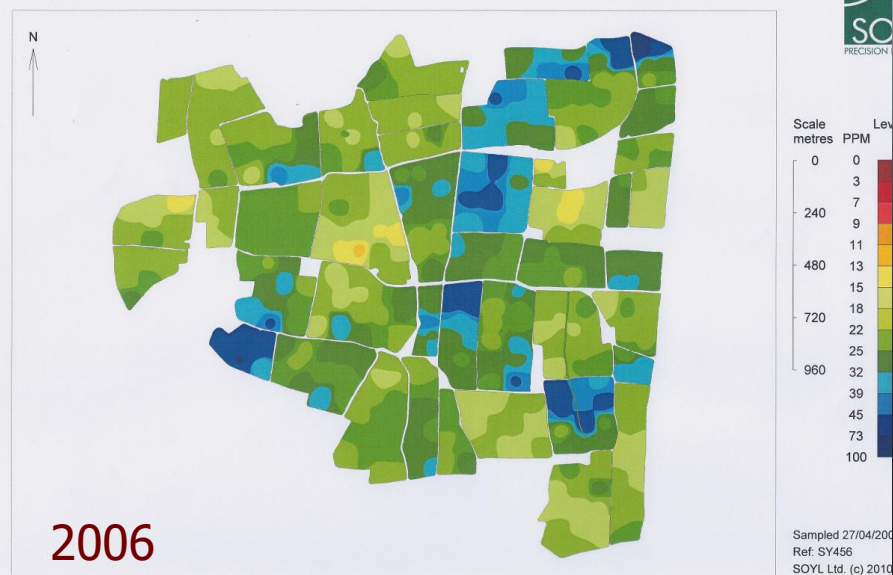
Phosphorus Map

-No 'P' added in last 8 years

2014

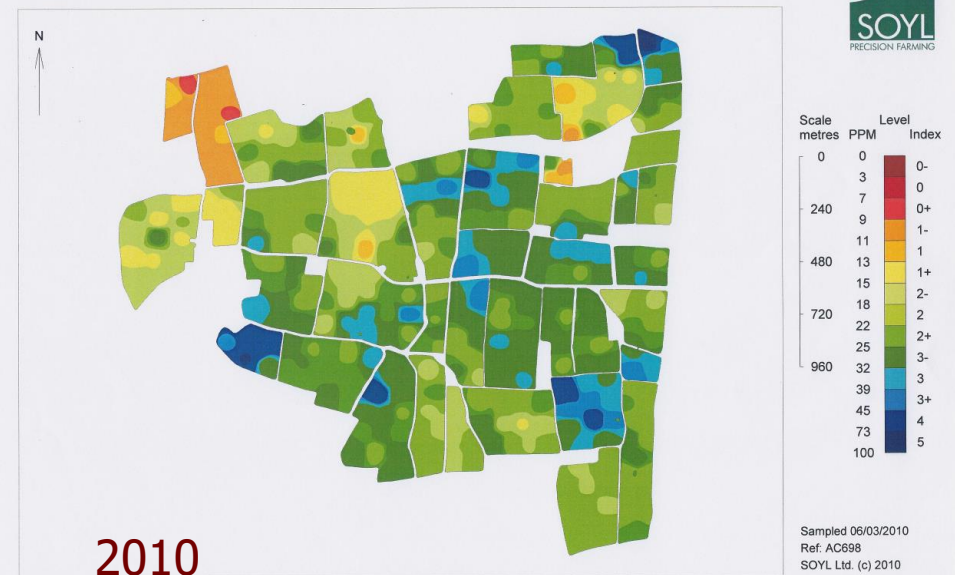


Phosphorus Nutrient Level Whole Farm Map Burton Lazars Farms, Burton Lazars Farms



2006

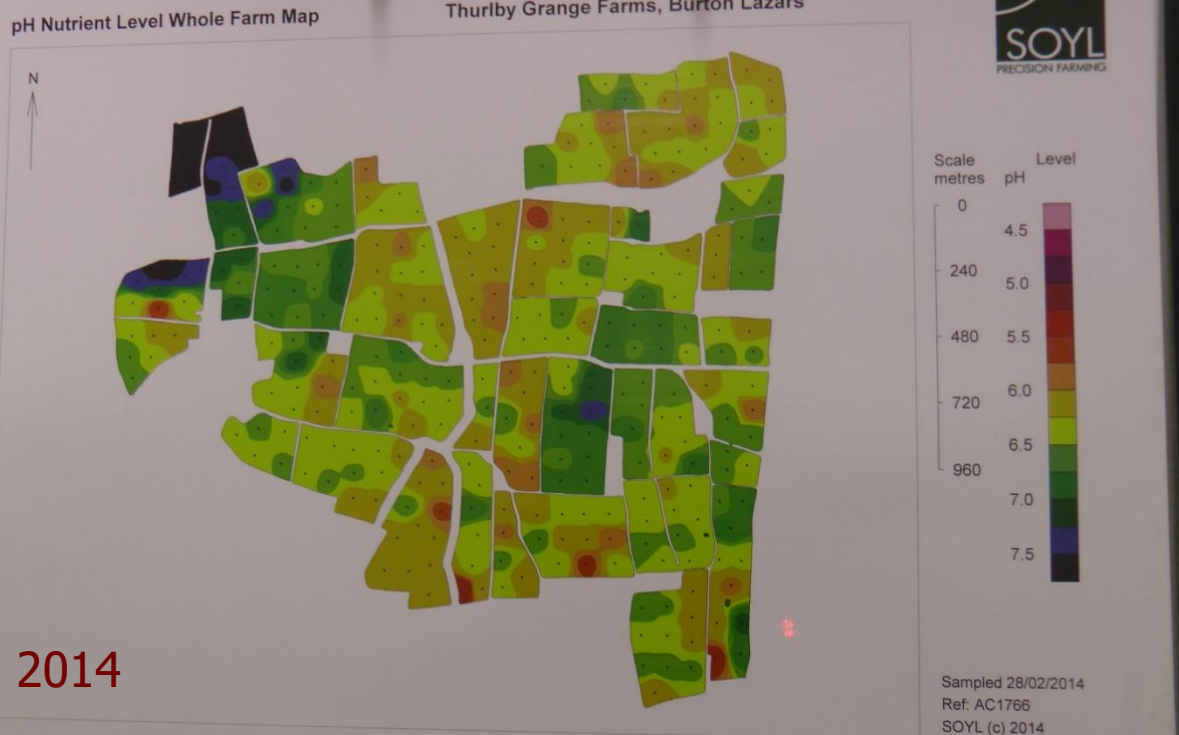
Phosphorus Nutrient Level Whole Farm Map Burton Lazars Farms, Burton Lazars



2010

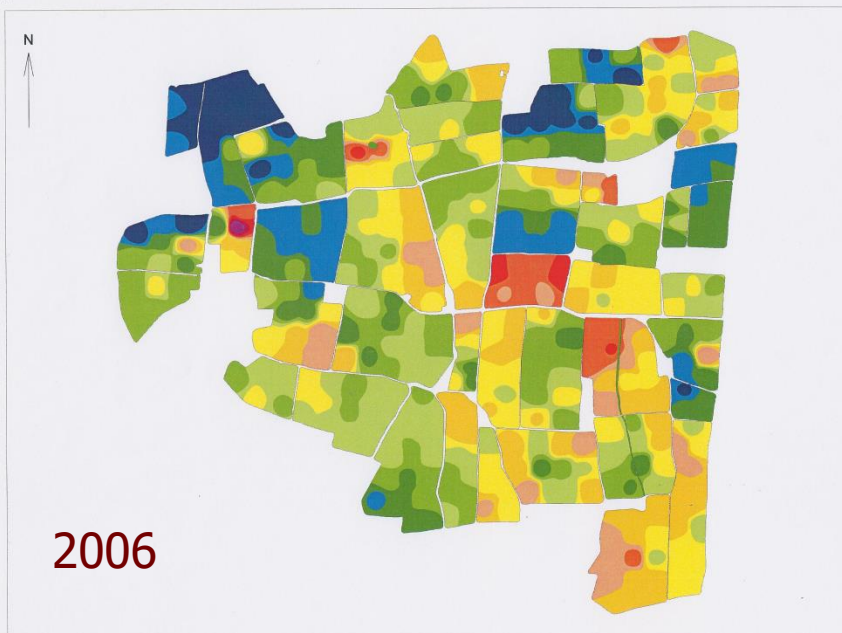
pH Map

-No Lime added in last
8 years



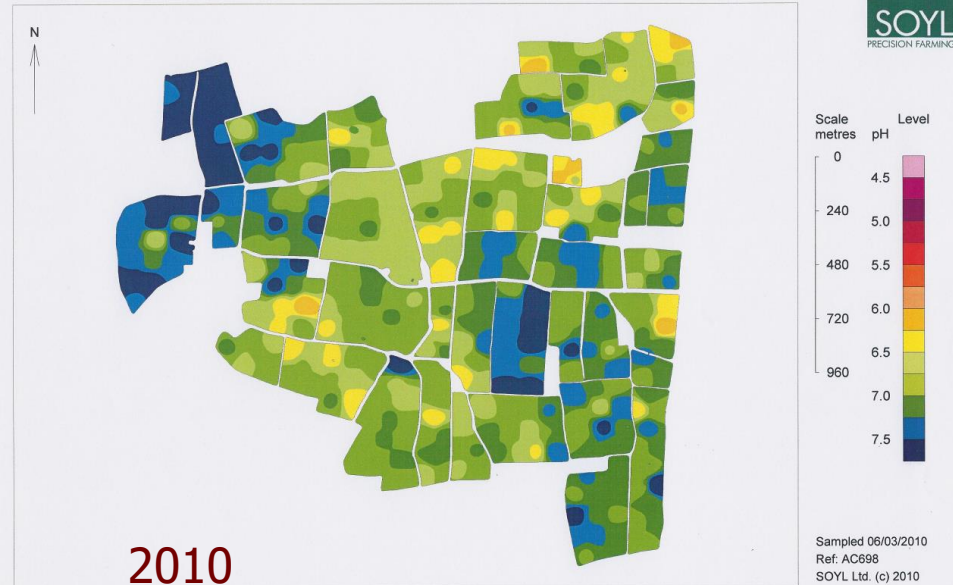
pH Nutrient Level Whole Farm Map

Burton Lazars Farms, Burton Lazars Farms

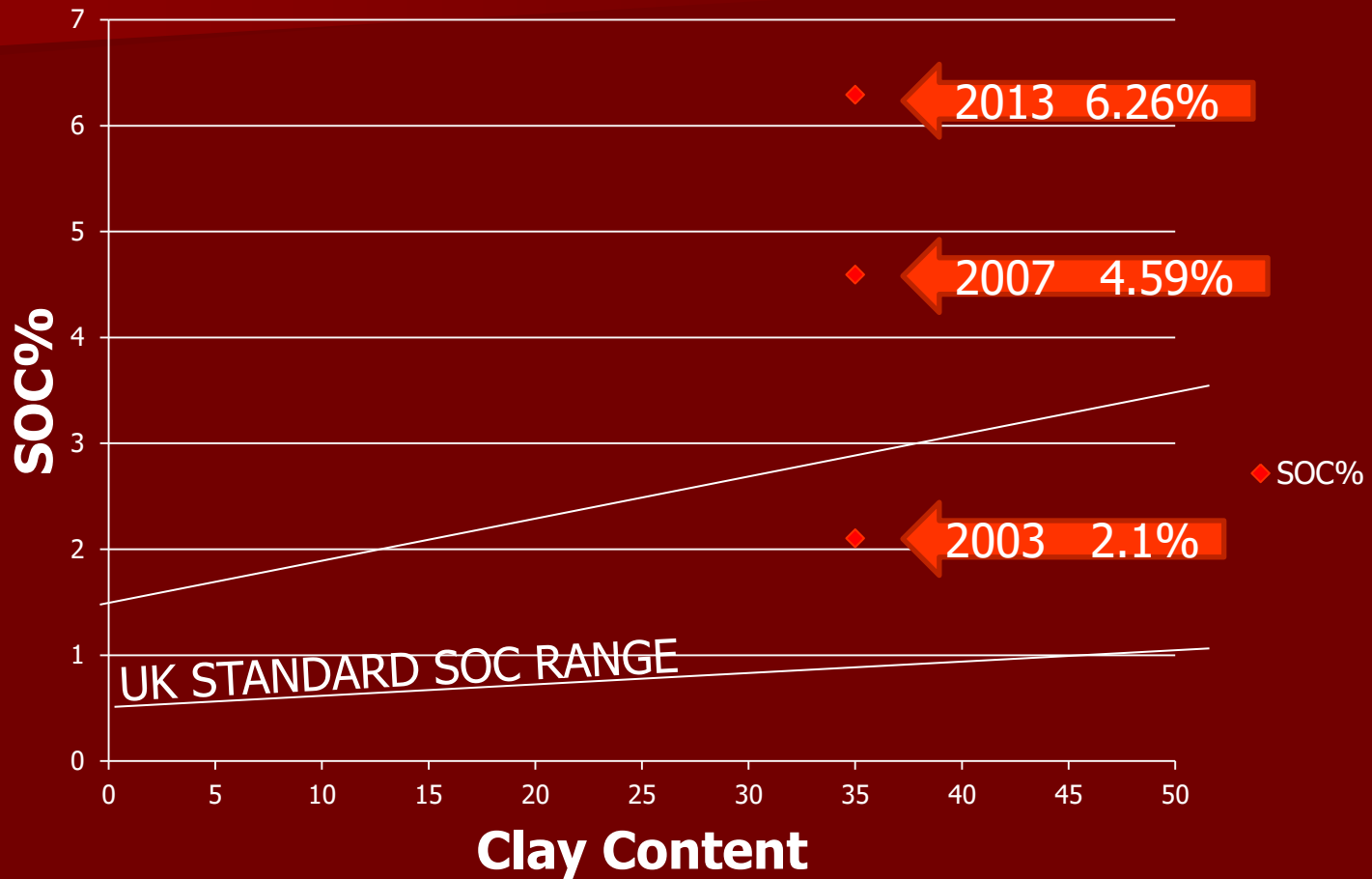


pH Nutrient Level Whole Farm Map

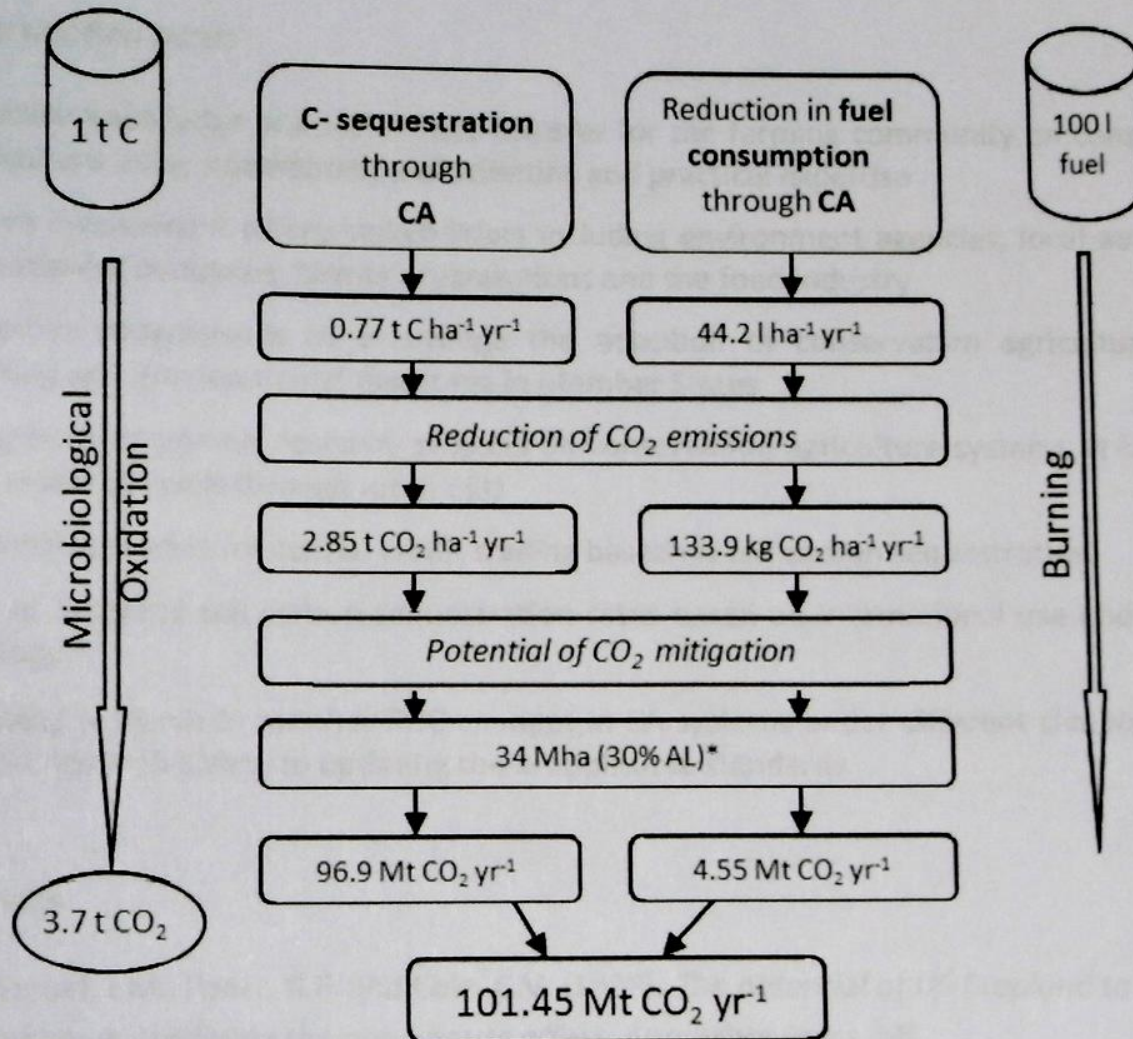
Burton Lazars Farms, Burton Lazars



Soil Organic Carbon



CO₂ Emission Reduction: No-Till (CA)



* When applied on 30% of total European Arable Land (AL), 113.4 M ha (Source: Eurostat, 2010).

Figure 1: Estimation of the potential reduction CO₂ emissions through the application of Conservation Agriculture in Europe (EU-27).



Don Reicosky
(Soil Scientist, Emeritus)

Soil Reconstruction Berkshire 2014



REGIONAL NEWS SOUTH EAST

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Berkshire Farm wins European land and soil management award

West Woodhay Farm, near Newbury, has won a prestigious European award for its work on land and soil regeneration.

The Land and Soil Management Award is presented by the European Landowners' Organisation (ELO) and the European Commission (Directorate-General for Environment and the Joint Research Centre) in association with the University of Natural Resources and Life Sciences in Vienna, Syngenta International and Ljubljana University. The award was created to recognise and encourage new concepts of land and soil protection and their implementation in land management.

West Woodhay Farm won the award for the development of its arable farming practice into a more sustainable and profitable business and its work on improving and maintaining the natural environment. This was achieved by moving from a full tillage-based arable system through to a zero-tillage system and changing rotation from all-winter cropping to a spring/fallow based system. In addition, West Woodhay has changed its fleet of agricultural machinery and committed to investment in long-term profitability.

The award was presented at a ceremony in Brussels by the President of the judging panel, Professor Winfried Blum of the University of Natural Resources and Life Sciences in Vienna.

CLA member Harry Henderson of West Woodhay Farm said: "We are obviously delighted to have won this very prestigious award, in particular because it recognises the importance of Conservation Agriculture for the future. Behind every success there is a story and we would certainly not be where we are today at West Woodhay without the advice and wisdom of Tony Reynolds and James Dockray. They both understood the relevance of this approach to farming some time ago and as pioneers have been most generous with their knowledge."



WINNERS: Stuart and Fiona Cath of West Woodhay Farm (centre) with (left to right) Jon Parr of Syngenta; Professor Winfried Blum; Claudia Olazabal of the DG Environment and Joint Research Centre; and Thierry de l'Escaille and Julianna Nagy of the European Landowners' Organisation

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David Blake	MRICS FAAV	01798 877555
Alex Wilks	MRICS FAAV	01798 877555
Chris Tipping	MRICS FAAV	01892 509280

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Earth worms

- **Described by Charles Darwin as the most important organisms on the planet.**

Quote:

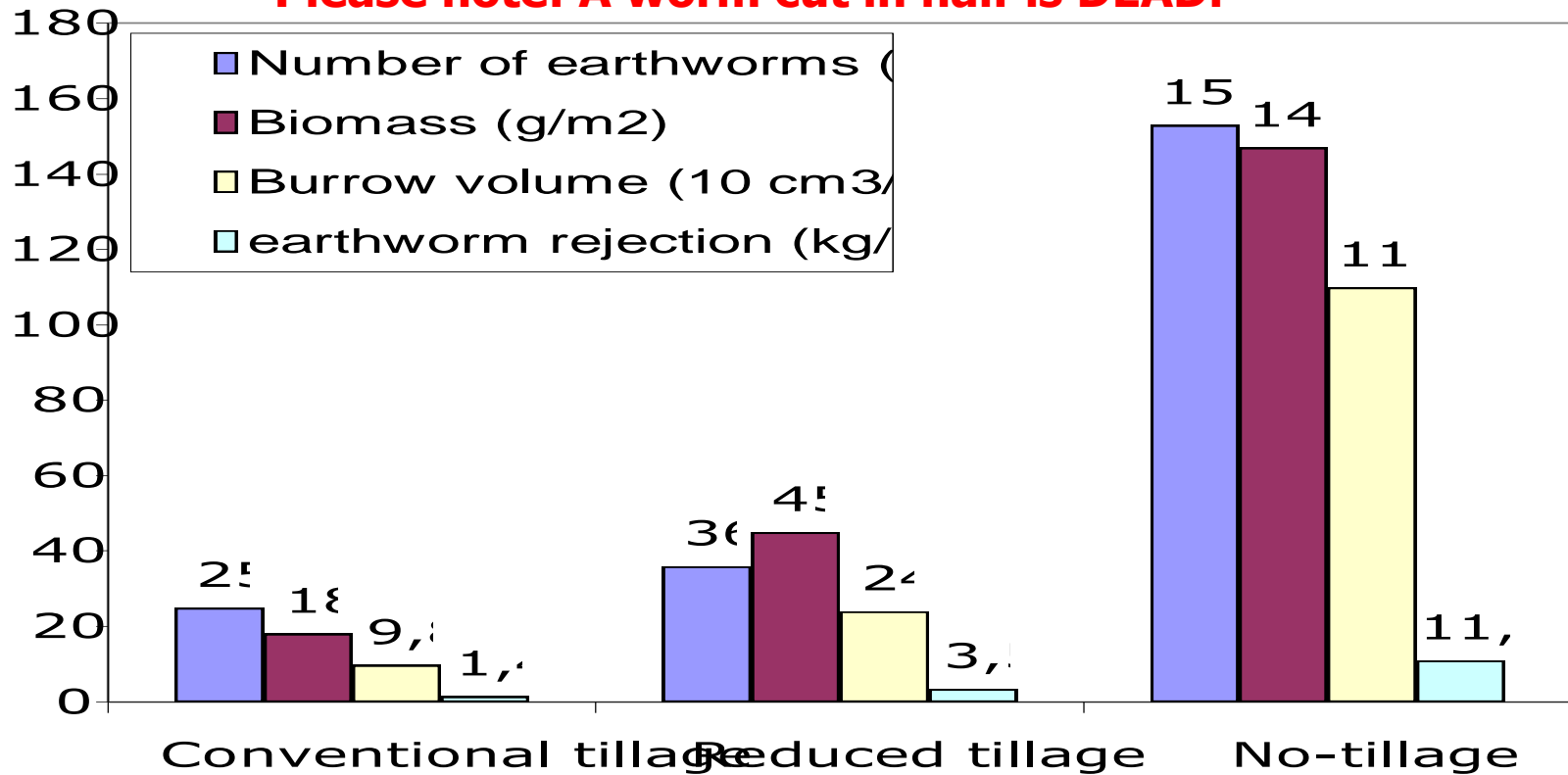
“I agree with Charles Darwin” !!!

Tony Reynolds

Biological Activity

Link between soil tillage methods, earthworm

Please note: A worm cut in half is DEAD.



Link between soil tillage methods, earthworm populations and their activity (Terbrügge F.)

Earth Worm middens



Investigation by Salifu Fusheini 2013

Reading University UK



4.3 Influence of CT and CA on Earthworm Species and Population Distribution

The second objective of the study was to examine the influence of CT and CA on earthworm species and population size in crop fields. A total of 47 earthworms were found at four locations of the CA field of which only one was an adult and was identified as *Lumbricus terrestris* (Table 4.2 and Figure 4.3).

In the CT field no earthworms were found at the time of conducting the study, indicating qualitatively that the earthworm population was very much greater in the CA field. In the absence of detectable earthworms in the CT field, no statistical analysis was required to demonstrate that the fields differed.

Sample Locations	Number of Earthworms	Identified Adult Earthworms	Species type Identified
T ₂	11	0	<i>Lumbricus terrestris</i>
T ₅	5	0	
T ₈	13	1	
T ₁₁	18	0	
Total	47	1	



Infiltration (Salifu Fusheini)



Conventional Tillage
followed by
Conservation Agriculture

Flooded Pasture January 2013





P & K Fertilizer for the
farm

Environmental Benefit

Lapwing nests
17th April 2014

3 of around 20 nests
on the farm



Brown Hare

- Population increased from approximately 10-12 head count in 2000.
- Head count today is approximately 100 across the farm.

Farmland Birds

There has been a huge increase over the past five years of all species from buzzards to skylarks.

Skylark

- The population of skylarks has quadrupled over the past five years.
- It is not unusual to hear and see 6 or 7 birds singing at any one time.

Starling

- We now have a flock of approximately 250 birds roosting in the No-till stubble.

Wildlife

- Conservation Agriculture has introduced a massive increase in the number and diversity of the farmland wildlife.



Total Equipment for 250 ha



Thurlby Grange Farms '10'



Total Equipment for 1000 Ha arable

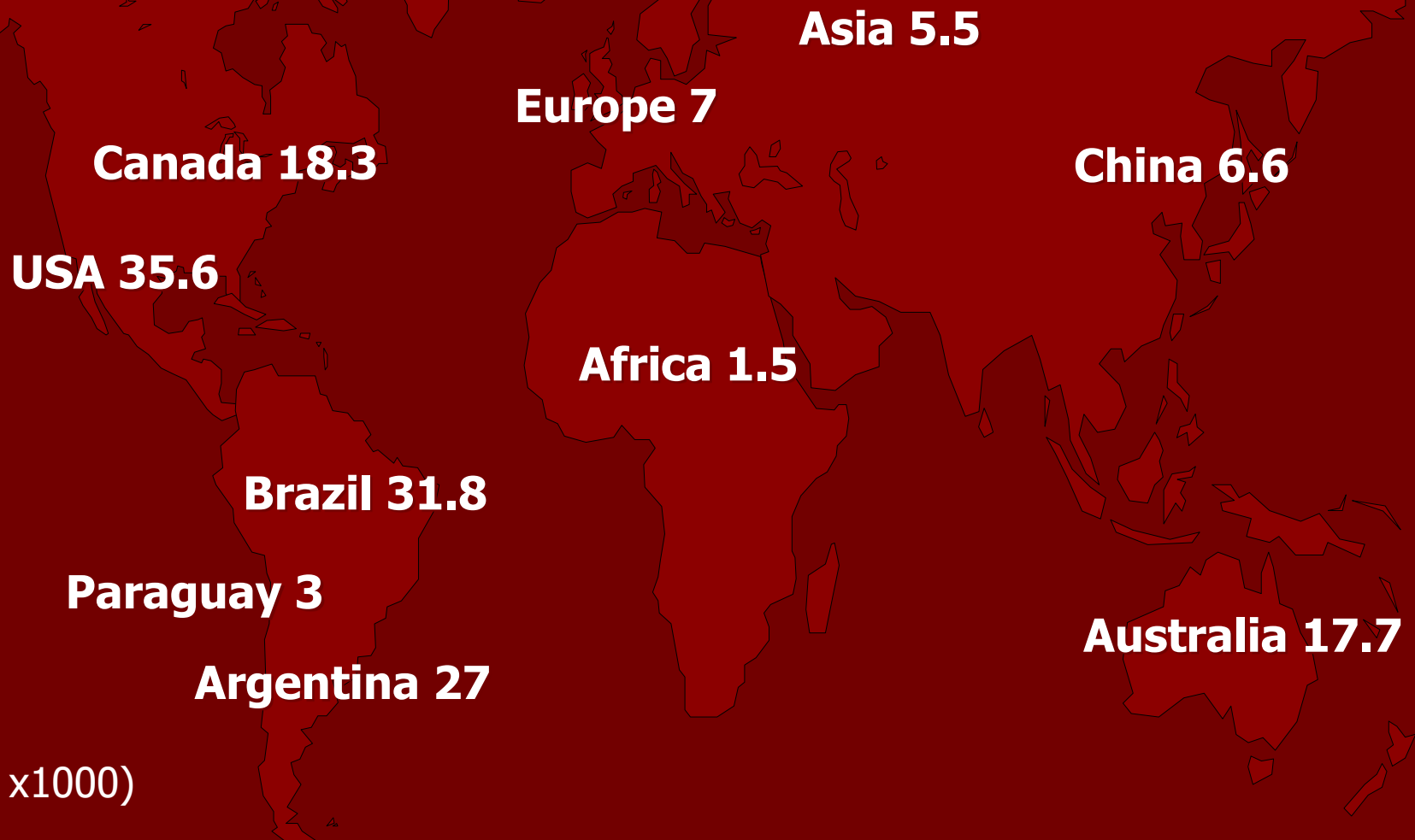
**Burton Lazars Farms
&
Wheathill Farms
2012**



Conservation Agriculture worldwide 154.8

Million ha

(FAO Statistics 2014)



Parting shot

So ladies & gentlemen, apart from:

Increasing soil fertility

Reducing diesel by 50%

Reducing P&K by 80%

Reducing nitrogen by 50%

Sequestering soil carbon

Reducing carbon footprint

“Increasing yields”

Increasing environmental benefits

& Saving the planet

What else do you want!