DESPITE ALL OUR ACCOMPLISHMENTS

WE OWE OUR EXISTENCE TO

A SIX-INCH LAYER OF TOPSOIL

AND THE FACT IT RAINS.

FARM EQUIPMENT ASSOCIATION
OF MINNESOTA AND SOUTH DAKOTA

Conservation Agriculture

(No-Till)

Making Sustainable Agriculture Real

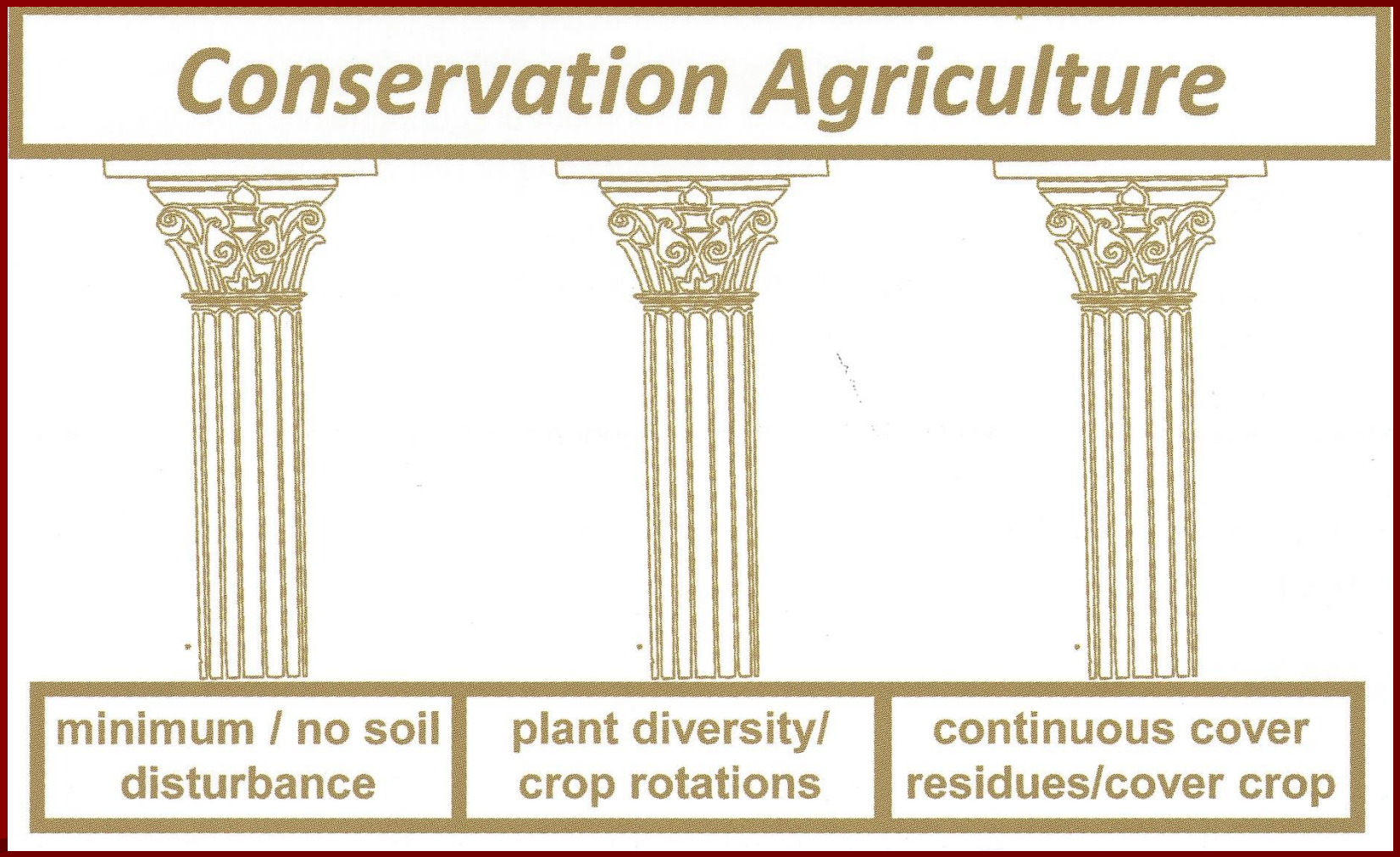
–

Reading University 1st February

The Problem

- Every night 870 million people go to bed hungry, 200 million of whom go to bed starving.
- Nearly 7 million hectares of farmland are lost to soil erosion every year.

A Decade+ of



In England

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

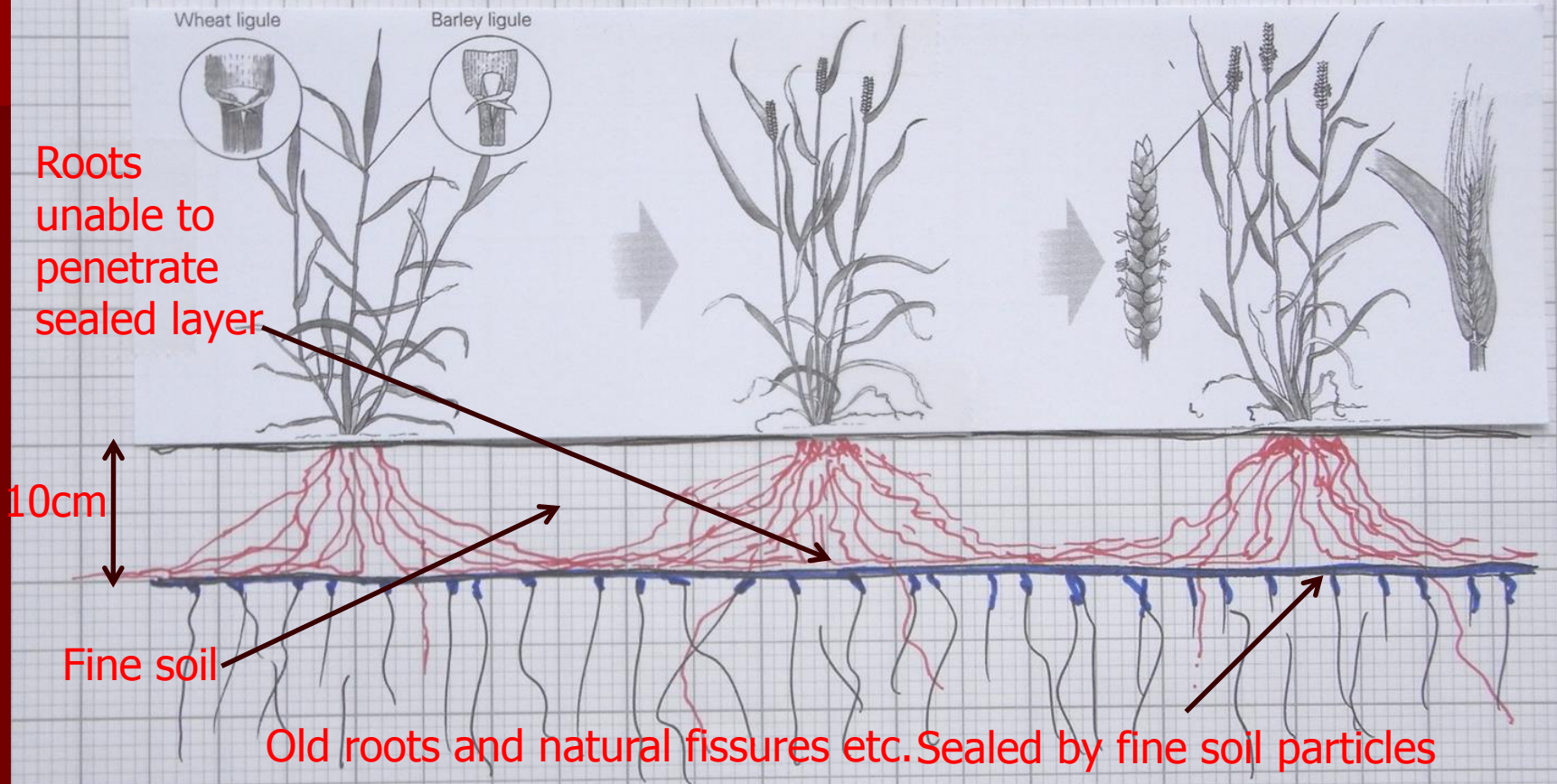
From the ***Ploughman’s Folly*** (1943)

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



Average root depths: Wheat and Barley = 120cm (4ft)
Oilseed Rape = 150cm (5ft)
Beans = 75cm (2.5ft)

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

38th 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

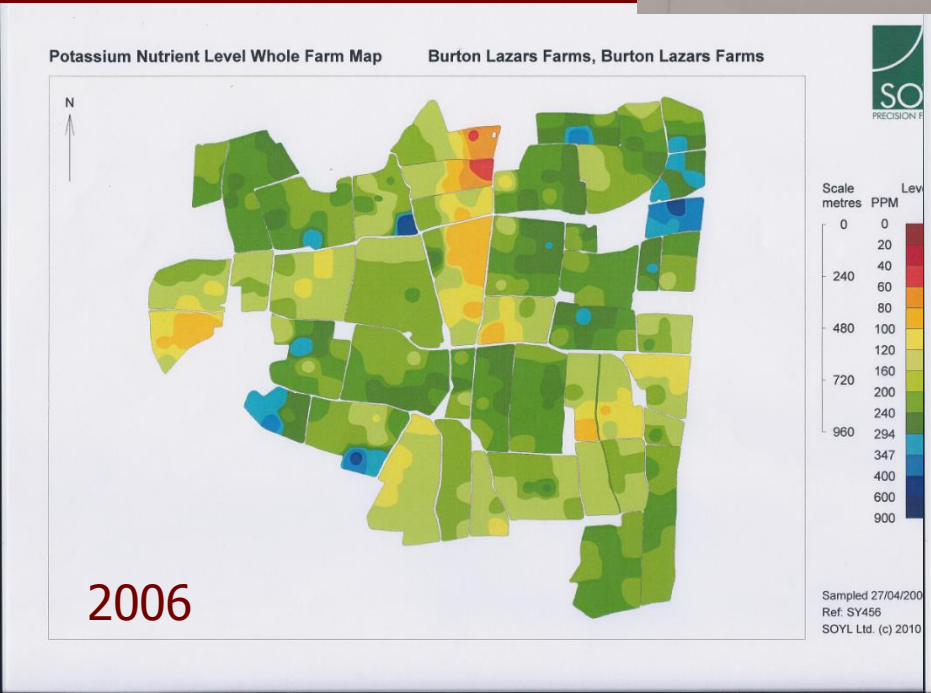
Yields

- 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.

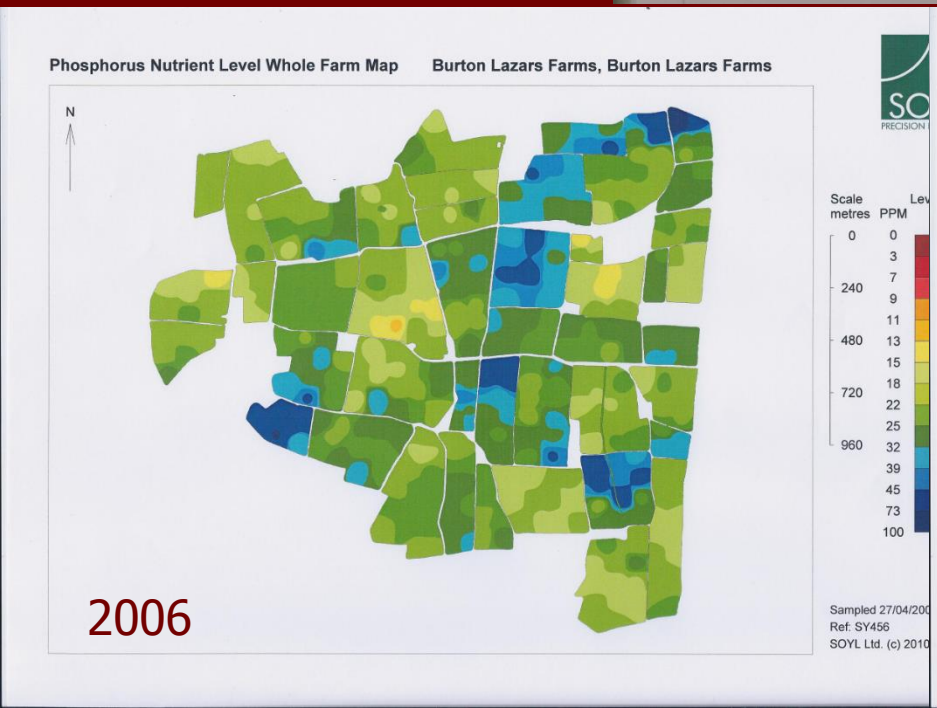
Potassium Map

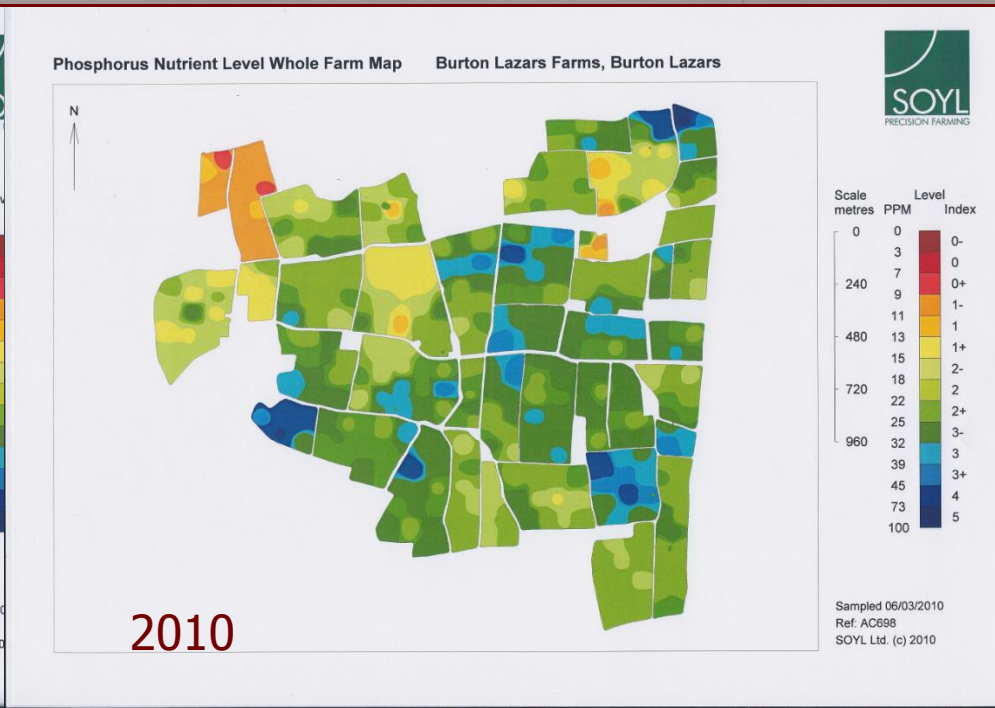
-No 'K' added in last 8 years



Phosphorus Map

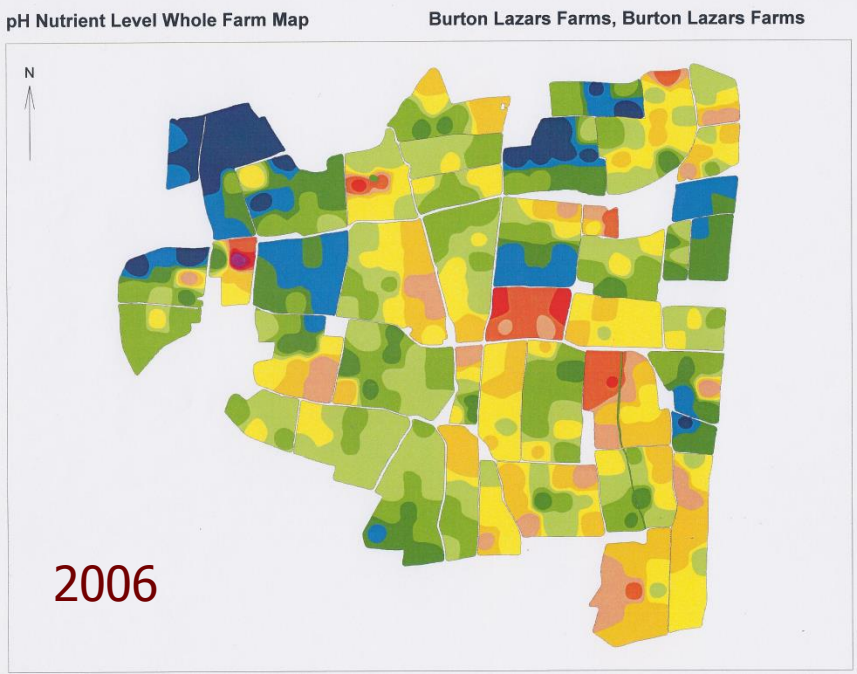
-No 'P' added in last 8 years

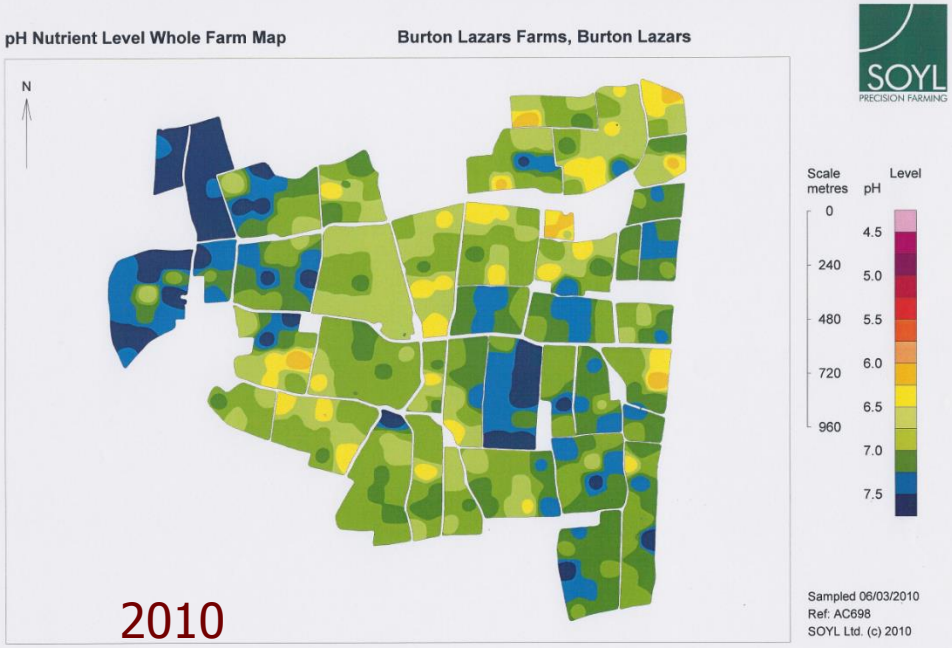




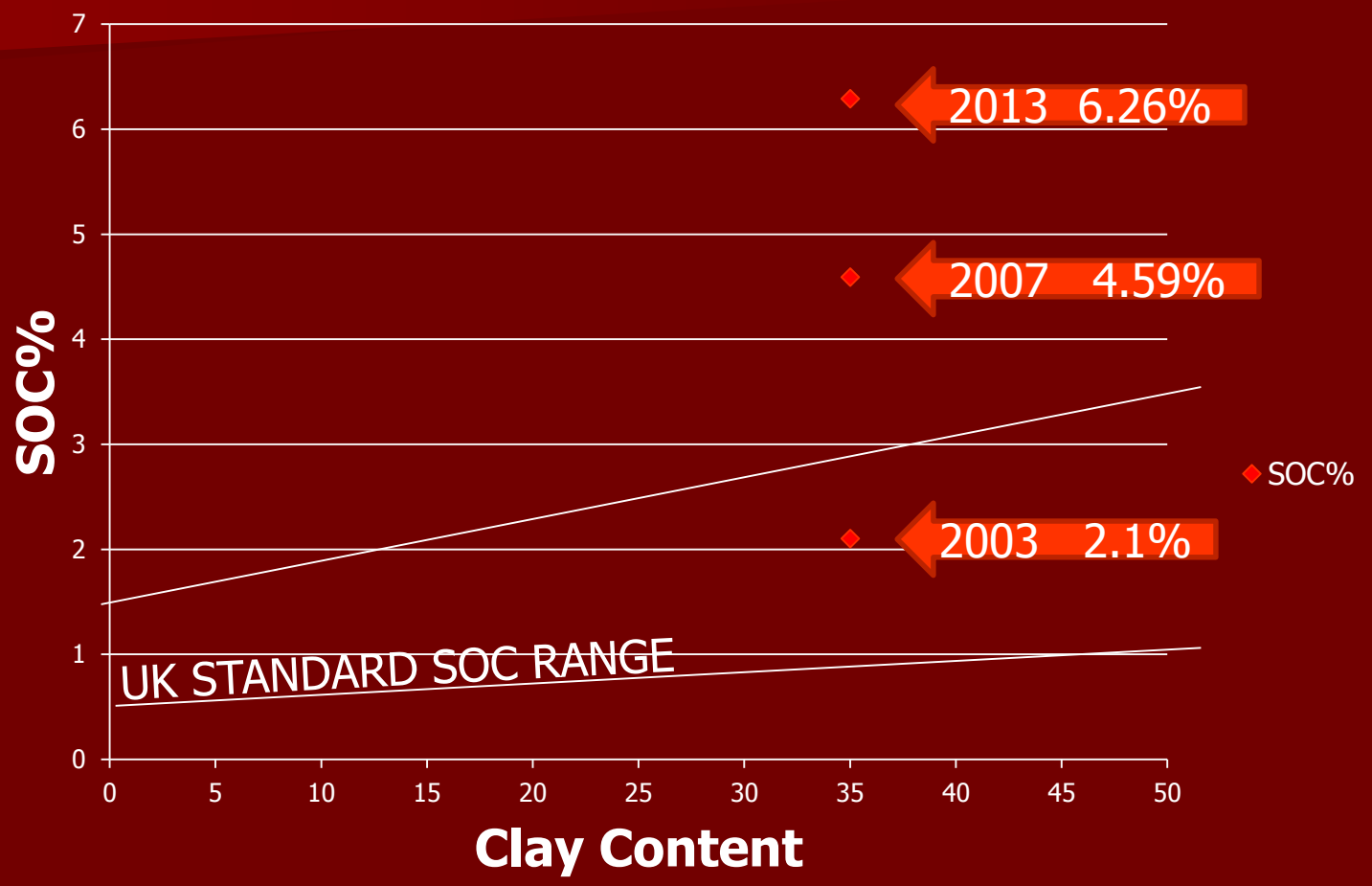
pH Map

-No Lime added in last 8 years

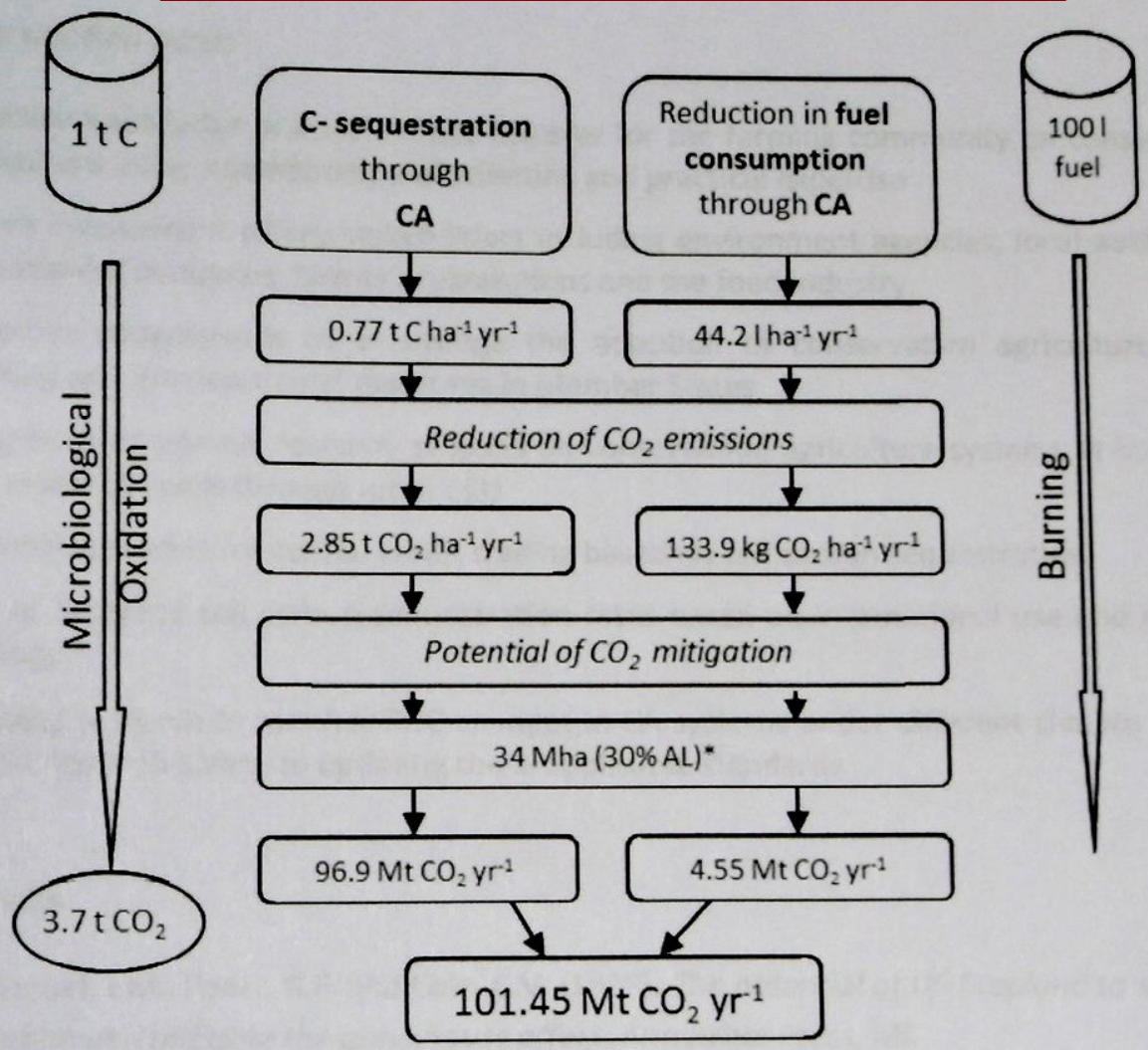




Soil Organic Carbon



CO^2 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 CO_2 emissions through the application of Conservation Agriculture in Europe (EU-27).

Don Reicosky
(Soil Scientist, Emeritus)

Soil Reconstruction
Berkshire 2014

REGIONAL DIRECTOR
ROBIN EDWARDS
Hikenield House, East Anton Court, Icknield Way, Andover, Hants SP10 5RG
t: 01264 313434
f: 01264 369196
e: robin.edwards@cla.org.uk

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.

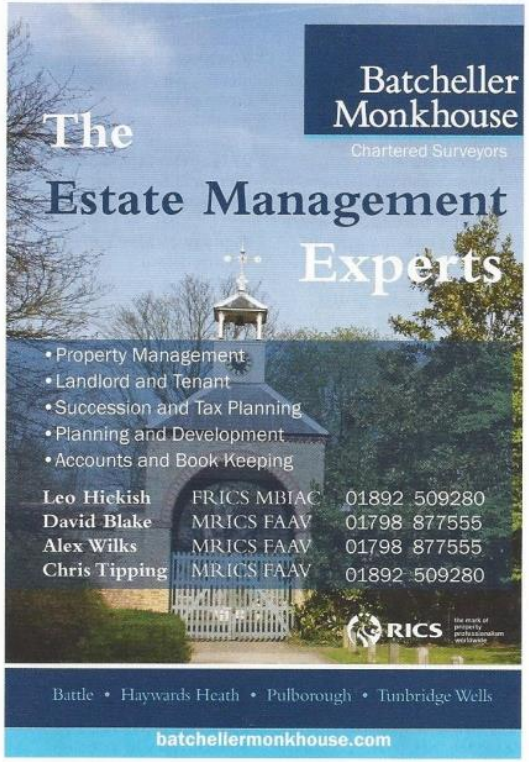
The Land and Soil Management Award is presented by the European Landowners' Organisation (ELO) and the European Commission (Directorate-General for Environment and the Joint Research Centre) in association with the University of Natural Resources and Life Sciences in Vienna, Syngenta International and 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



Earth worms

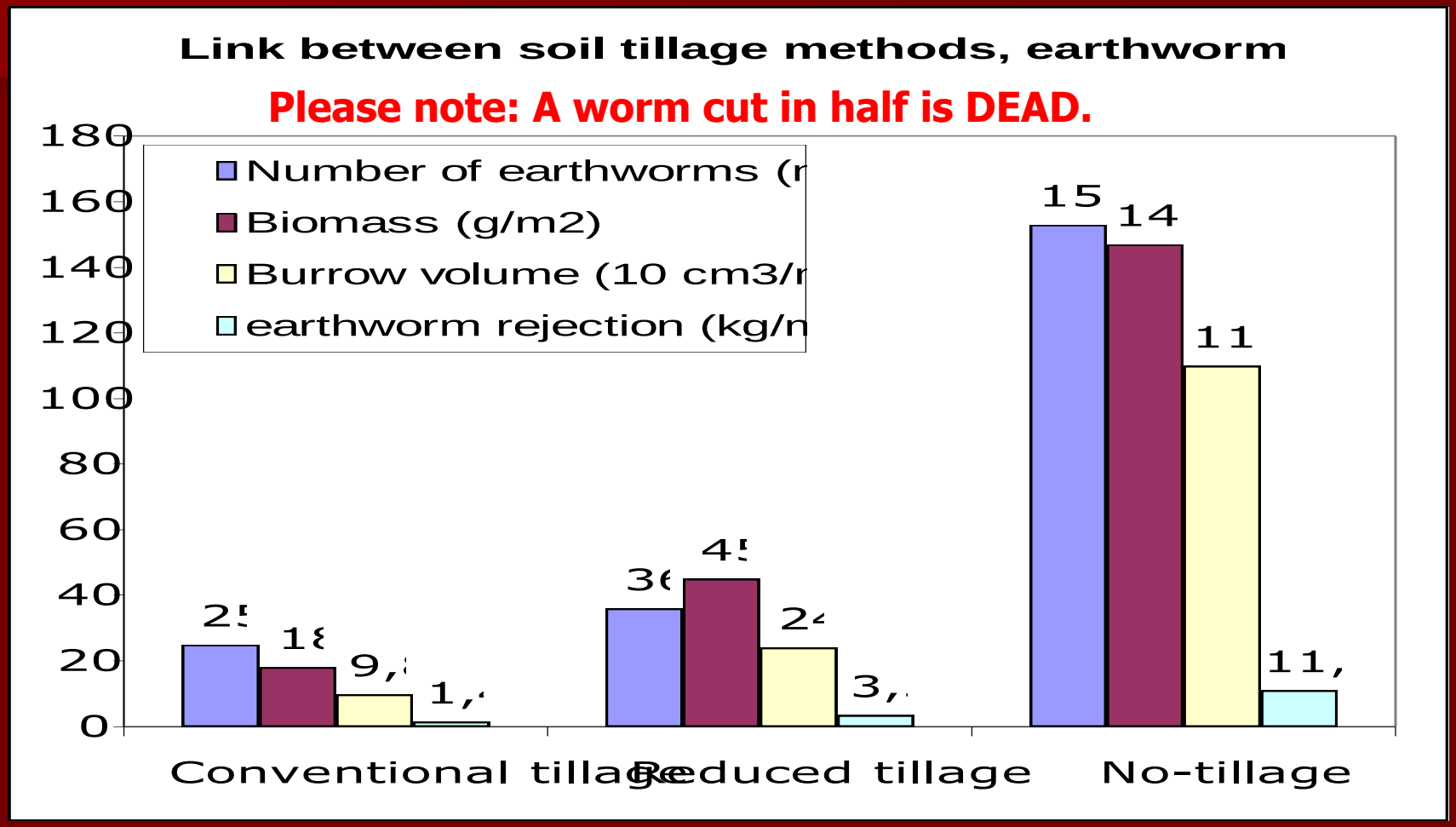
- **Described by Charles Darwin as the most important organisms on the planet.**

Quote:

"I agree with Charles Darwin" !!!

Tony Reynolds

Biological Activity



Link between soil tillage methods, earthworm 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	
T_5	5	0	
T_8	13	1	*Lumbricus terrestris*
T_{11}	18	0	
Total	**47**	**1**	

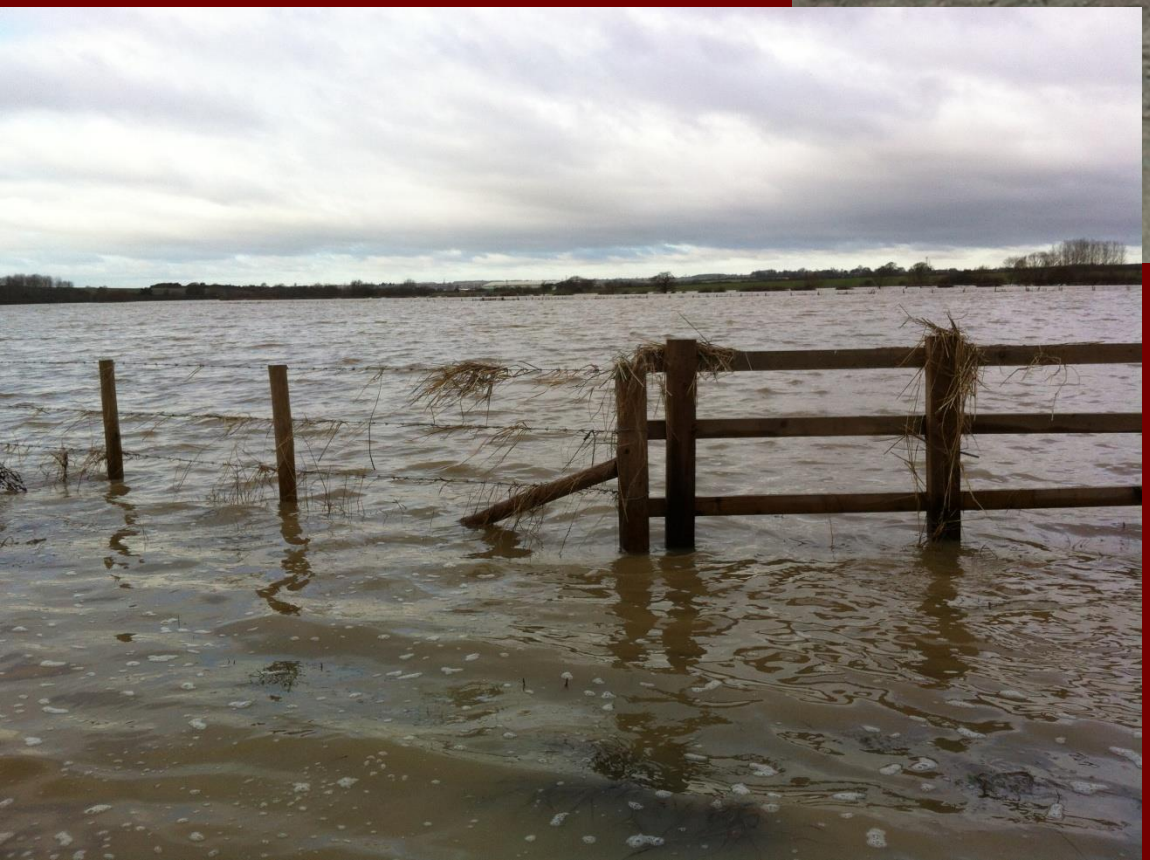
Infiltration (Salifu Fusheini)

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
2015

CA is not just for large scale Agriculture

"Before I only had 0.3ha, now I am farming an additional 0.8. The land I have under CA is beautiful, soft and fertile, with no erosion"
Ansila Gerald 60yrs old, Maweni Tanzania

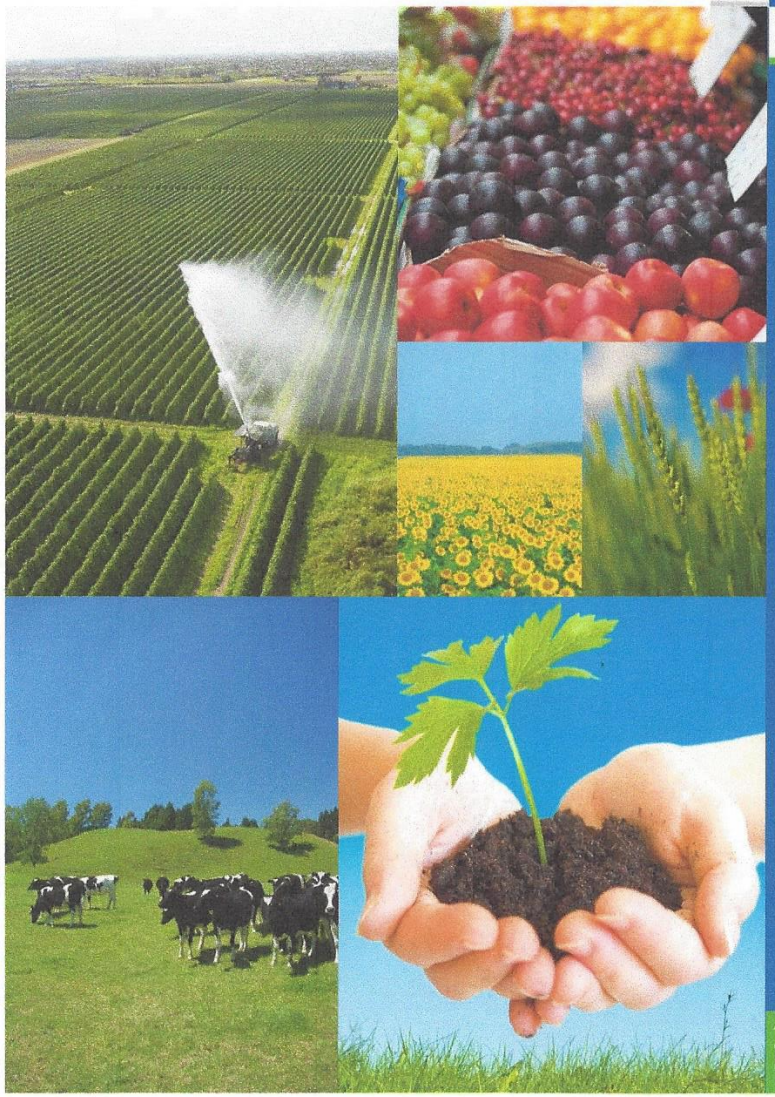
"As a widow, I realized that CA is the only way I can get significant production. I have really improved my farm production and as a side benefit I have a stronger cattle herd."
Sostina Mlambo, 51 yrs old, Midzi Villlage Zimbabwe

"I bought 4 goats with the income from CA fields, as well as paid the school fees for my grandchildren."
Ruth Muleya, 55 yrs old, Hanyanga Village, Zambia

Conservation Agriculture worldwide 154.8 Million ha

(FAO Statistics 2014)

(ha x1000)



European Commission

The contribution of the CAP to sustainable agriculture

Seminar: *Making sustainable agriculture real*

European Parliament
13 January, 2016

Pierre Bascou
DG Agriculture and Rural Development
European Commission

Agriculture and Rural Development

European Commission

Contribution of the 1ST Pillar in support of the development of conservation agriculture

- Main principles and practices of conservation agriculture are reflected in :
  - Minimum soil disturbance
  - Minimum soil cover
  - Crop rotation

- Under **cross-compliance** some GAEC as GAEC 4 on minimum soil cover, GAEC 5 minimum land management, GAEC 6 maintenance of soil organic matter level can contribute to the CA purposes in certain extend depending on requirements defined by MS;

- Under **greening**, *crop diversification* (even still basic requirements) and *some elements under EFA* especially catch crops and green cover (depending on farmers choices and management) can also promote the CA practices.

European Commission

Concluding remarks

The new CAP should play a key role in ensuring a transition towards <u>more sustainable agricultural models in the EU, including conservation agriculture,</u> in order to ensure its long-term food security

- A large panoply of instruments and complementary approaches to meet needs for more environmentally-friendly models
- Significant budgetary support
- A close link with research and innovation policy
- Flexibility left to MS/regions and diversity ensured for implementing this transition according to the specific needs

Parting shot

So ladies & gentlemen, what does conservation agriculture offer apart from:

Increasing soil fertility

Reducing diesel by 50%

Reducing P&K by 80%

Efficient use of Water

Sequestering soil carbon

Reducing carbon footprint

"Increasing yields"

Increasing environmental benefits

& Saving the planet

What else do you want!