Gezonde bodem, Gezond eten, Gezonde mensen

voor een gezond bedrijf in een vitale wereld

Dr Ir Maarten Stapper FAIAST

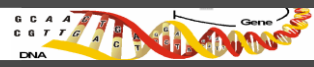
Nederland
2, 4, 5 & 9 juli 2018

Punten in de Presentatie

- Gezonde mensen in een viatale wereld,
- Natuur vriendelijke landbouw
- Bodem leven
- Bodem chemie & fysica
- Beheer akker- en weidebouw
- Belang van koolstof
- Hoe beginnen of verder gaan . . .

21st century health problems

Only 5 % caused by



'Lifestyle factors' – Less nutritious food and living with more-and-more synthetic chemicals in:

- Home – '*kill those germs and insects*'
- Body care – '*look & smell good*'
- Medicine – '*cure the sick, antibiotics*'
- Food – production: high yields, no losses
  processing: *easy, looks, taste & shelf life.*

Problems: *Impact of **repeated use** and **cocktails***
*Killing & avoiding **beneficial microbes***

Dr Carole Hungerford, 'Good Health in the 21st Century'

Change to a Modern Diet

Traditional Diet **Modern Diet**

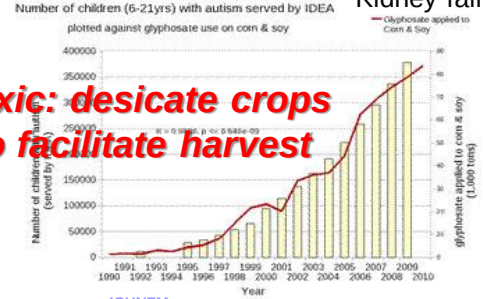
Weston Price 1930's

Is the produce we buy healthy?

Current produce becoming **less nutrient dense** with **unsafe chemical residues**:

- Mean of nutrients down by 30-80% since 1948.
  (McCance and Widdowson's The Composition of Foods)
- Plant-based food servings contained 25% less nutrients compared to organic.
  (*www.organic-center.org/reportfiles/NutrientContentReport.pdf*)
- One week on an organic diet reduced organophosphates in adults' urine by 90%.
  Dr Liza Oates, RMIT (2013)

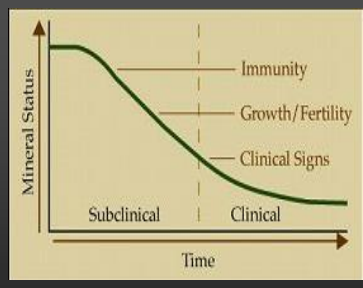
Chemical-load including Glyphosate / Obesity, Autism, Diabetes, Kidney failure



Toxic: desicate crops to facilitate harvest

J.M.Smith (2017) www.ICHNFM.org Survey Reports Improved Health After Avoiding Genetically Modified
Dr Stephanie Seneff *et al*. (2015)
N.L.Swanson et al. (2014) J. of Organic Systems, 9(2)

Lowering Nutritient Density & Gut Microbes



Generational impact

*Minerals & Microbes **DOWN** = chronic diseases **UP***
Epigenetics

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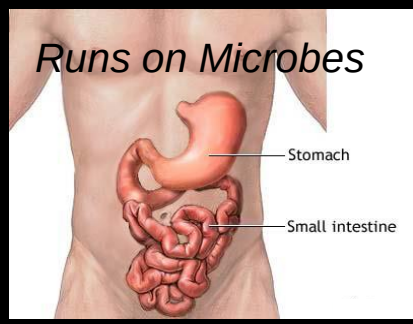
The Incredible Body . . .



creating our immune system

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Our Incredible Planet . . .

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Healthy Soil outcomes for Plants

- Deep and dense roots for extraction of the **minerals needed**,
- Balanced nutrient rich plants,
- Plants **resistant** to insects & diseases creating compounds to defend,
- Plants **tolerant** to environmental stress creating compounds to defend.

Healthy Soil outcomes for Animals

Animals eating *Healthy Plants*:
become calm, contented,
need less time for grazing,
have improved fertility,
are productive with high quality produce.

and avoid:
Foot rot, Mastitis, Bloat,
Pink eye, worms, ticks . . .

Healthy Soil outcomes for People

Improved **Food quality**:

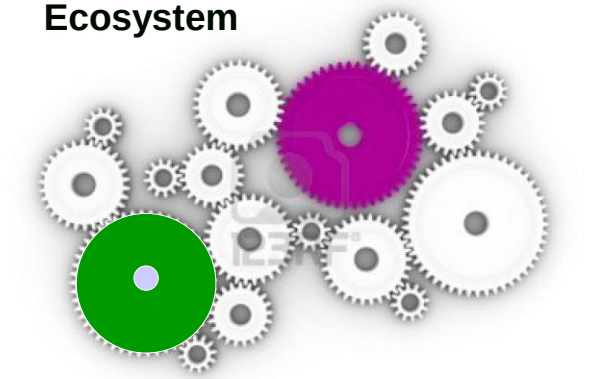
- Nutrient dense: *minerals, vitamins phytonutrients,* fatty acids
- Better taste & energy
- Better texture, longer shelf life
- Much lower toxic residues.

Improved **Environment**:

- Biodiversity in landscapes
- Less toxins, clean water and air
- Slowing global warming

Preventing *disease . . .*

Ecosystem



all processes are linked with different rates . . .

All Sciences have Paradigm Effect .

Factors that influence research outcomes

- Boundaries of our world: How we learned to think, beliefs, assumptions, values & habits,
- Fragmentation of science creates false divisions and very narrow fields of research,
- Funding within current paradigm comes with expected outcomes; short term trials,
- Research method: randomized, multi-factorial,
- Peer pressure tries to keep us there….

Creates filters in our thinking and vision

Such research doesn't solve the cause of a problem, but creates band-aids to be replaced.

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Wat is een Gezonde Bodem?

Wanneer is een [illegible] ziek?

[illegible] de symptomen?

Problemen voorkomen,

niet alleen behandelen.

Chronische Bodem Problemen en Landschapspijn

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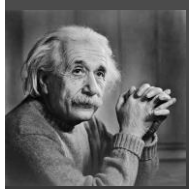
How to obtain better solutions?



"We can't solve problems by using the same kind of thinking we used when we created them."

Albert Einstein

We need *New Thinking:* *Holistic*

for *New Systems:* *Agro-ecological systems*

eg. Low input, biological farming, organic, biodynamic.

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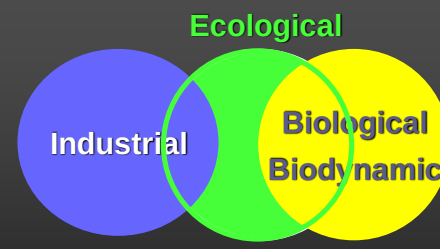
From Industrial towards Biologic



The 3rd Way

Agroecological systems

Regenerative Agriculture

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Importance of soil management

Farming systems

Industrial Ag: maximize **output** thru **inputs**
people

Agroecological Ag: maximize ***soil health***
soil organisms

VRT

feeding & protecting growing plants

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Ecological Farming Principles

- **Regenerate soils** – Re-activate the **Soil Food Web** which will increase **soil organic carbon**.
- **Reduce synthetic** fertilizers and chemicals, use bio-fertilizers & stimulants to steer productivity and resilience.
- **Recycle:** plant residue, old growth & manure processed in field or composted.
- Farming practices that maximise **Soil Health** and stop reliance on synthetics**:**
  - minimise soil disturbance
  - maximize days **green ground cover**
  - protect soil with mulch
  - multi-species of plants
  - promote landscape **biodiversity.**

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Methods & Tools

Practices, what, how, when

Monitoring, plant, animal, soil

Tests, soil, plant, sap

Meters, in field use

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Biological based inputs

Broadcast – Seed – Liquid inject – Spray

- **Biological stimulants**: humates, fulvic & humic acids, seaweeds, molasses, fish proteins, worm juice, BD preparations, exhaust fumes, plant extract, compost, compost tea/extract,
- **Biological inoculants**: compost, compost teas, Liquid brews, VAM, worm juice
- **Mineral fertilisers**: soft rock phosphate, crushed rock minerals, lime, gypsum
- **Biological fertilisers**: worm juice, worm cast, fish proteins, seaweed, compost, compost tea/extract, composted manure, BD preparations.

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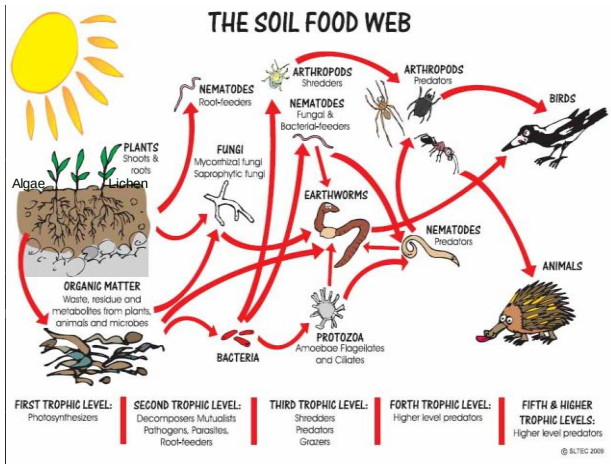

Micro-organisms in healthy topsoil

Species diversity: up to 50,000

Numbers: 10^8-10^9 microbes on a teaspoon

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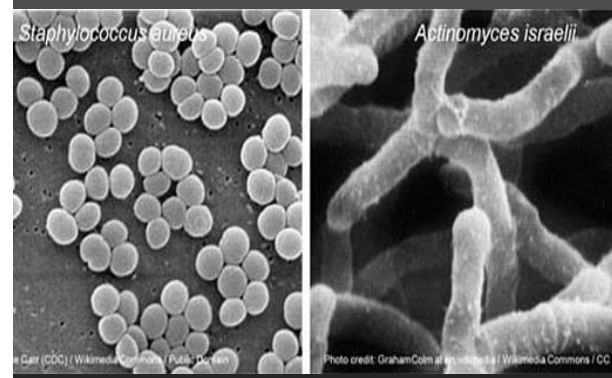
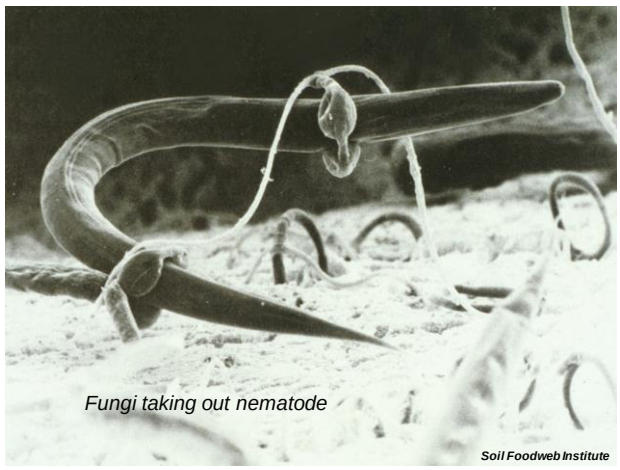
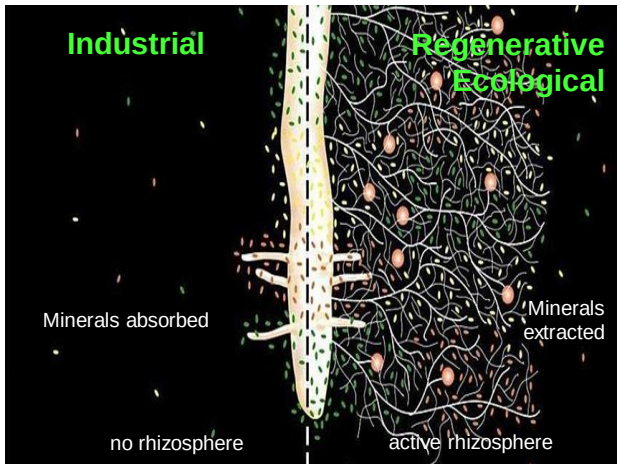
Examples of bacteria







Life in the zone around roots - Rhizosphere

- Plants release exudates from roots to feed microbes who protect them & provide minerals,
- Plants can alter the type of exudates for different purposes, *eg*. stop a pathogen attack,
- Type of exudate varies with plant species,
- Any **left-over carbon** exudate is transformed into **humus** by microbes to improve soil fertility → *next season more roots, more microbes*!
- Science is discovering communication networks (frequencies and chemicals) between plant and microbes for this powerful symbioses.

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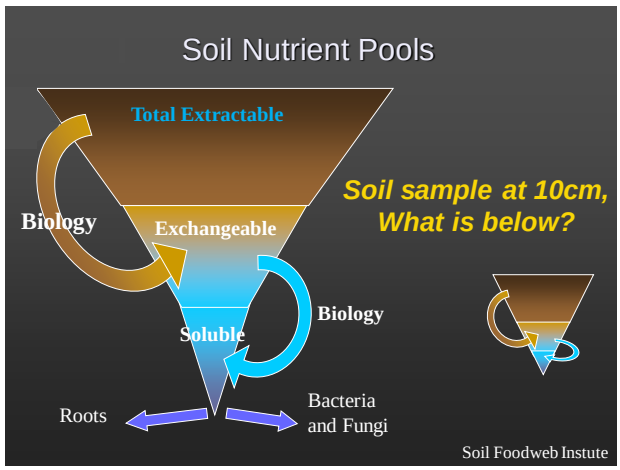

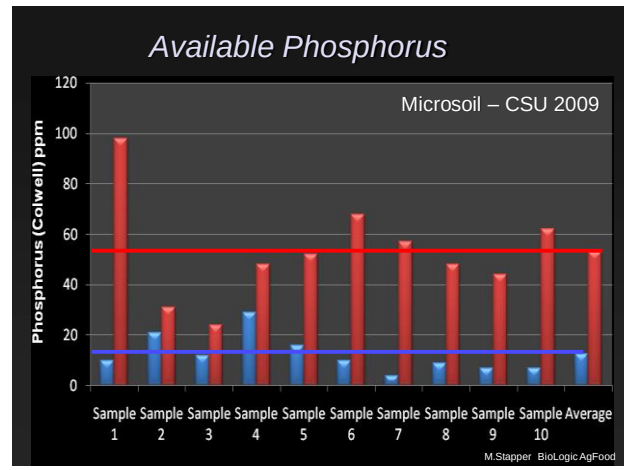

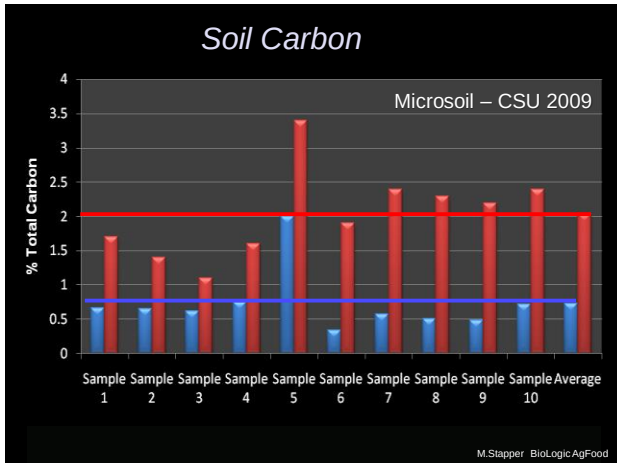
Soil Carbon
Microsoil – CSU 2009
% Total Carbon
0
0.5
1
1.5
2
2.5
3
3.5
4
Sample 1
Sample 2
Sample 3
Sample 4
Sample 5
Sample 6
Sample 7
Sample 8
Sample 9
Sample 10
Average
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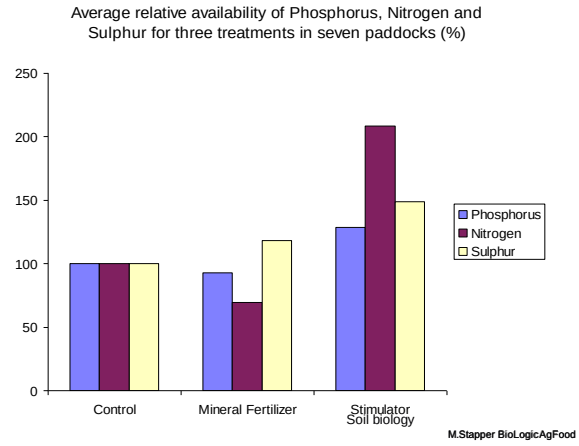
Average relative availability of Phosphorus, Nitrogen and Sulphur for three treatments in seven paddocks (%)
250
200
150
100
50
0
Phosphorus
Nitrogen
Sulphur
Control
Mineral Fertilizer
Stimulator Soil biology
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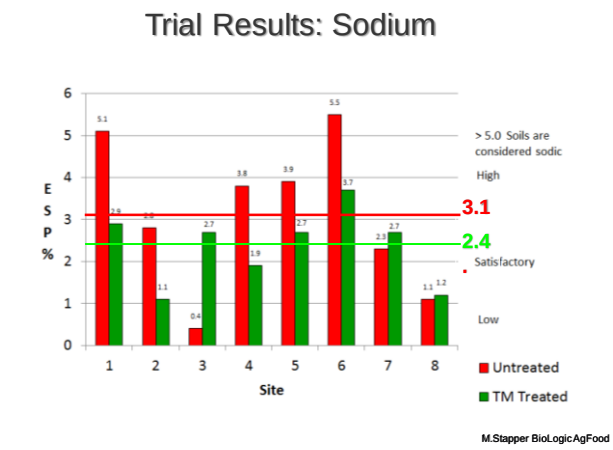
Trial Results: Sodium
ESP %
0
1
2
3
4
5
6
5.1
2.9
2.6
1.1
0.4
2.7
3.8
1.9
3.9
2.7
5.5
3.7
2.3
2.7
1.1
1.2
1
2
3
4
5
6
7
8
Site
> 5.0 Soils are considered sodic
High
3.1
2.4
Satisfactory
Low
Untreated
TM Treated
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Soil Health through Ecosystem Functioning
Design Landscape:
Biodiversity, green cover
Woodlands - Wetlands
Windbreaks - Shelterbelts
prevent runoff . . .
Manage paddock:
minimize fertilizers & chem.
use bio-fertilizers & minerals
time controlled grazing . . .
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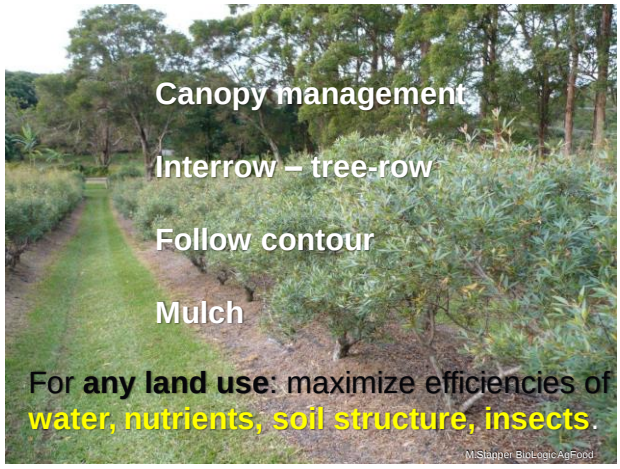
Canopy management
Interrow – tree-row
Follow contour
Mulch
For any land use: maximize efficiencies of
water, nutrients, soil structure, insects.
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rhizospheres
Ron & Bev Smith
"Orana"
Fish Creek, Vic
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Colin Seis "Winona", Gulgong NSW
Pasture Cropping


Colin Seis
Gulgong, NSW
Regenerative
over 10 years
+ 4.6 t C/ha/yr
Christine Jones
Industrial
Regenerative
Ecological


Soilkee Renovator
pasture cropping tool to improve production
by regenerating soils and filling feed gaps
Niels Olsen, Drouin VIC


30 July 2012
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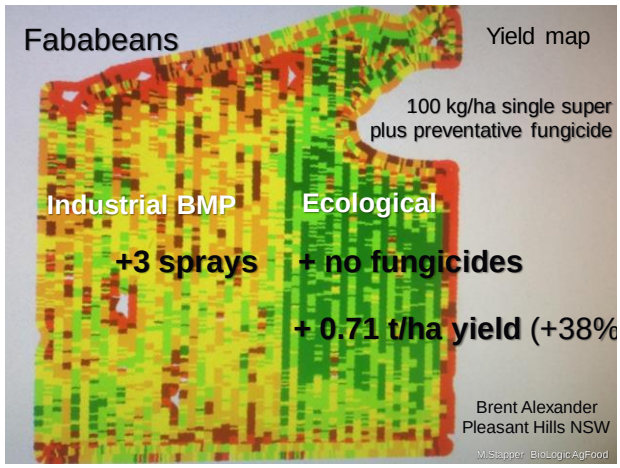
Summer crop established with Soilkee – winter 2012


Fababeans
Yield map
100 kg/ha single super
plus preventative fungicide
Industrial BMP
Ecological
+3 sprays
+ no fungicides
+ 0.71 t/ha yield (+38%
Brent Alexander
Pleasant Hills NSW
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fleabane
Industrial
no fleabane
after 18 months
Regenerative
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Manage weeds with Soil Health
conventional treatment
Irrigation Trial plot alleyways
biological treatment
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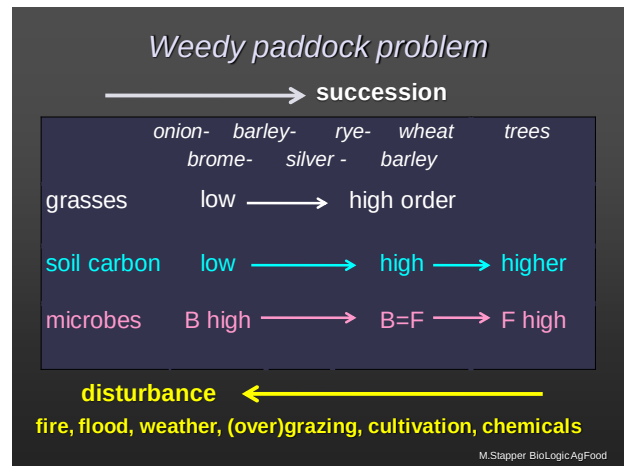
Weedy paddock problem
succession
onion- barley- rye- wheat trees
brome- silver - barley
grasses low high order
soil carbon low high higher
microbes B high B=F F high
disturbance
fire, flood, weather, (over)grazing, cultivation, chemicals
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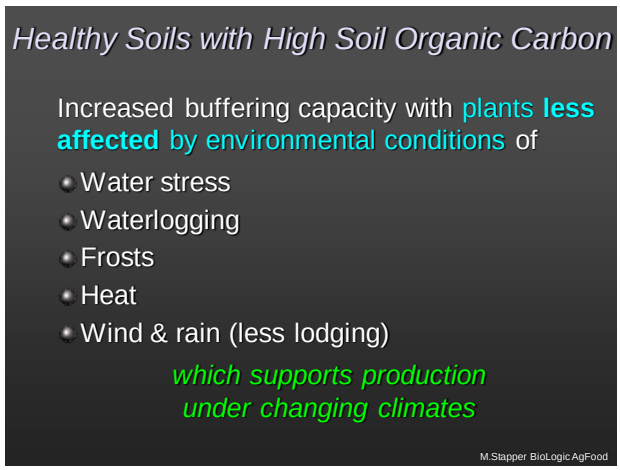
Healthy Soils with High Soil Organic Carbon
Increased buffering capacity with plants less affected by environmental conditions of
Water stress
Waterlogging
Frosts
Heat
Wind & rain (less lodging)
which supports production
under changing climates
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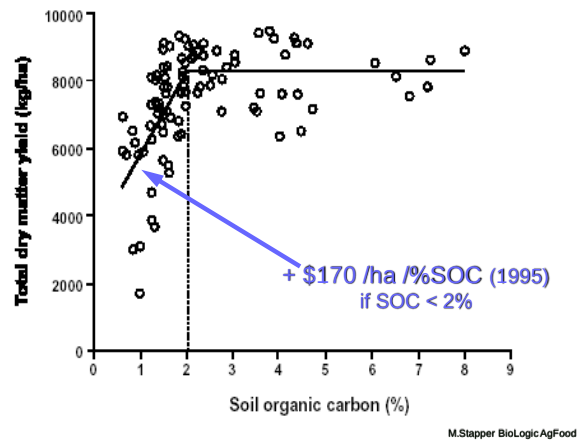
Total dry matter yield (kg/ha)
10000
8000
6000
4000
2000
0
0 1 2 3 4 5 6 7 8 9
Soil organic carbon (%)
+ $170 /ha /%SOC (1995)
if SOC < 2%
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Soil regeneration – making new soil

Achieving potential requires:

- Least soil disturbance
- Full green **ground cover** with active growing plants having deep & dense roots
- **Humus formation** – complex molecule:
  1000 ***C*** *need 83* ***N****, 20* ***P****, and 14* ***S***
  microbes make available the **C, N, P & S**
  microbes & ***earthworms*** make the **humus**.
- Minimize synthetic fertilizers and chemicals which disrupt microbial balance and cause carbon loss.

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How to get started? Don't wait for others

- **Accept the new thinking**
- Start **step-by-step** – learn as you go
- Work within current budgets, *eg*. 1st year 20% of budget for biological inputs
- Some (split) paddocks or whole farm
- Monitor to enhance learning
- Find **like-minded people** to enhance learning & decision making – build your own **network**….

Commitment for at least two years
to get the agro-ecosystem going . . .

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Transition to Agroecology as Mainstream

Local solutions – community driven!

Community Movements . . .

Purchasing Healthy Food
with low Environmental Impact

To brake vested interests and obtain support for resilient farming requires appropriate:

Education
Science
Policy . . .

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Gezonde bodem,
Gezond eten,
Gezonde mensen
voor een gezond bedrijf in een vitale wereld

Hartelijk dank

Respect voor voedsel!

– Step Into Biological Farming –

**New Thinking & Management*
**Healthy Soils with Biology & Carbon*
**Field Walks *Why not GM*
**Healthy Food – Healthy People*

DVD-pack of 6 discs in One box
Special price $110

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