

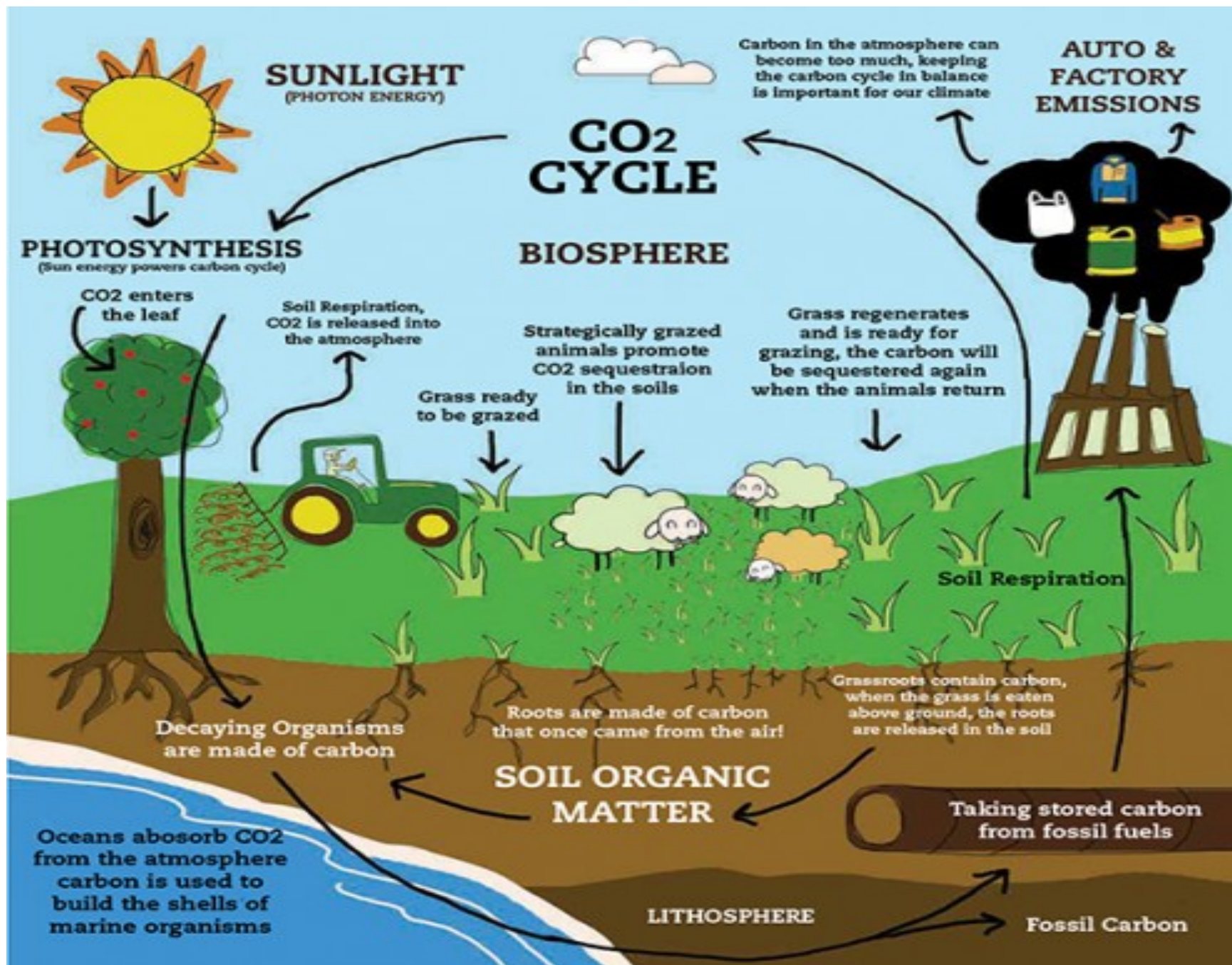
East Coast Organics using VUNA Products and Bio-Agronomy to improve Soil CARBON



"Science and Nature working together"

Healthy Crops lead to healthy people





HUMUS



"Science and Nature working together"

- Humus or Organic Matter = Carbon in soil
- CO₂ accounts for 76% of Greenhouse Gases
- 1% decrease in OM = 35 tons CO₂ to Atmos/ha
- Ave OM in last 100 years is down by 70% from 5% to 1.5%
 - OFS and KZN Coast = < 1%
 - World Agri contributed 476 gigatonnes of C
- World has 60 years of top soil left at current degradation
 - RSA's biggest export commodity is Top Soil

HUMUS



"Science and Nature working together"

- 2030 World Temp up by 4 deg C
 - (ref: International Energy Agency)
- A 5.5 deg C increase – Humans will not survive
- Temp increase of 1 deg C to date
- 2015 is set to be the warmest ever
 - = 0.85 deg C above 20th Century average, BBC current
- Temperature increase could kill us before we run out of top soil

HOWEVER



"Science and Nature working together"

- 1% increase of OM /Ha
= 35 tons CO₂/ha back to the soil from atmos
– stock rates, tillage methods, green manures, rotation
Therefore, every 1000 ha = 35 000 tons of CO₂
back from the atmosphere to the soil
- 1% increase in OM / Ha
= 170 000 L more water held / Ha
- Agriculture alone can reduce the Greenhouse effects by 50% simply by looking after our soil and rebuilding what we have destroyed over the last 100 years
– (ref: G Sait of Nutri-Tech Solutions)





Pelletised Carbon Based Fertiliser builds OM to create healthy soils

- Carbon = food for microbes
- Carbon = safe haven for microbes
- Carbon = moisture retention
- Chemistry = balanced macro & micro
- Chemistry = retained in root zone
- Humates = hold chemistry for plants
- Biology = added microbes

Urine and its products will be part of this



Versatility

Use as:

- Base fertiliser eg 1 ton/ha
- To add specific trace elements eg boron
- Blend with conventional fertiliser
- Add microbes to soils
- Application of organic sourced nutrients
 - VUNA

Cabbage at 36000 p/ha = 100 tons
Brix of 11/12



Large scale row crop farming





Livestock

- Require healthy fodder
- Healthy fodder grown on healthy soil
- Require fodder 12 months/year
- Controlled grazing
- Impact grazing
- LSU/ha
- Leave no less than 10 cm growth post grazing



2015 Agriculture

- Over grazing leads to zero humus
- Leads to erosion
- Low carrying capacity Ha/LSU
- No capacity for fodder bank
- Low nutrition
- Low calving percentage
- Low water holding capacity

Erosion

Due to mismanagement



June 2015, 4 months of winter remain

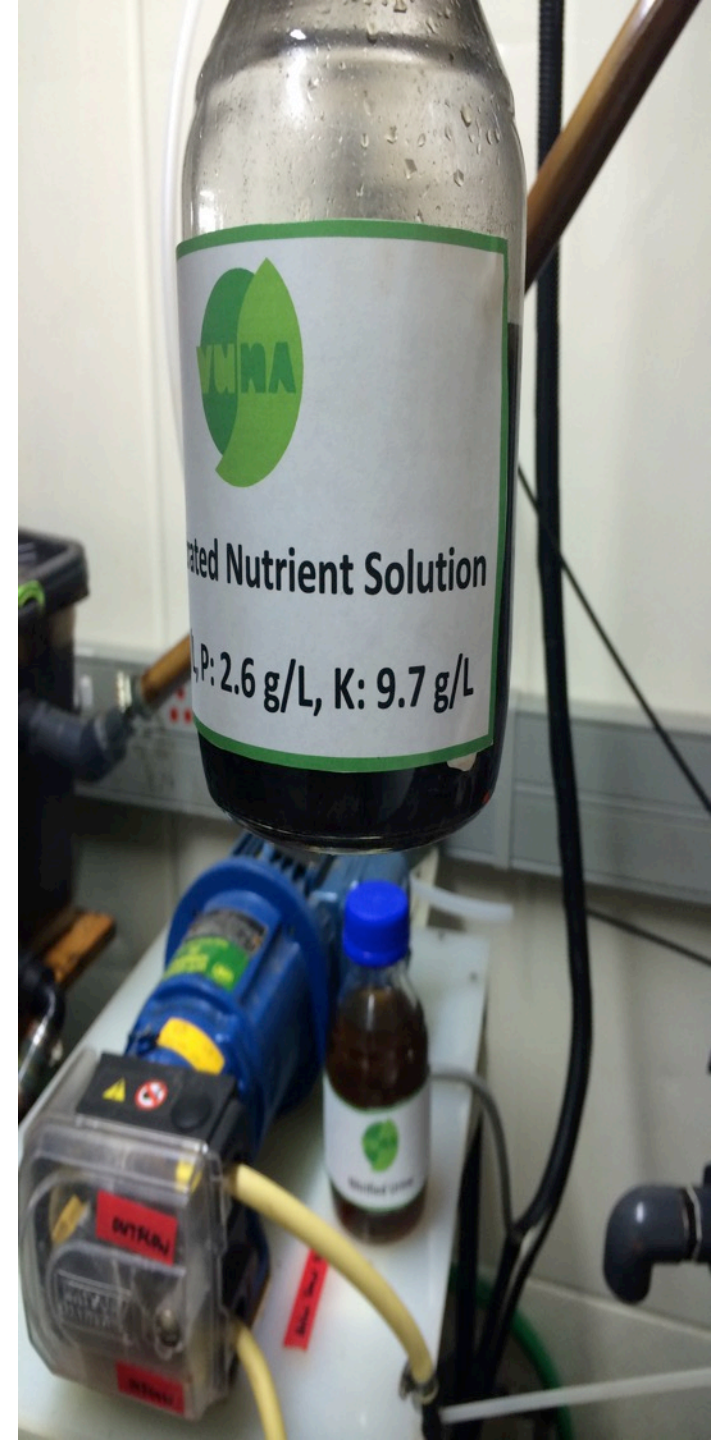


Over grazed and reduced OM



Urine as a fertiliser

- Crossword puzzle clue
 - Compound found in Urine, synthesized as a fertiliser
 - 4 letters
 - What is the answer?
 - **UREA**
 - Synthetic UREA
 - Value is R 5500/ton
 - Up to 60% can volatalise
 - Reduces BRIX levels - nutrients



URINE as a Fertiliser



"Science and Nature working together"

- Humans pass say $2 \text{ L/day} \times 365 = 730 \text{ L / year}$
- Dry Fertiliser
 - 5 % as dissolved solids
 - 37 kg recoverable solids
 - $37 \text{ kg} \times 50 \text{ million} = 1.85 \text{ million tons of nutrients}$
- Liquid Fertiliser
 - Applied at a ratio of 20:1 $\text{H}_2\text{O} : \text{Urine}$
 - $730 \times 50 \text{ million} = 37,5 \text{ million tons of liquid applied fertiliser}$

URINE as a Fertiliser



"Science and Nature working together"

- Applied as a liquid or as a dry fertiliser
- Is a sterile and balanced fertiliser as is
- Contains more than just NPK and trace elements
- Carbon at 6g / L = 1.3 million tons
- Auxin levels are high = cell elongator
 - Post hail storm apply Auxin Foliar feed – pick plant up
 - Apical dominance
 - Root tip growth
 - Budding

Conclusion



"Science and Nature working together"

Remember there is no single "silver bullet" for Agriculture

- Build soil OM back to 5% plus
- Responsible land management required
 - stock rates, tillage methods, green manures, rotation
- Responsible use of synthetic in-puts, avoid where possible
- Use Carbon source with every fertiliser
- Improve soil biology
- Moisture management is essential