East Coast Organics using VUNA Products and Bio-Agronomy to improve Soil CARBON
Healthy Crops lead to healthy people
Carbon in the atmosphere can become too much, keeping the carbon cycle in balance is important for our climate.

Photosynthesis
(Sun energy powers carbon cycle)

CO2 enters the leaf

Soil Respiration, CO2 is released into the atmosphere

Grass ready to be grazed

Strategically grazed animals promote CO2 sequestration in the soils

Grass regenerates and is ready for grazing, the carbon will be sequestered again when the animals return

Soil Respiration

Decaying Organisms are made of carbon that once came from the air!

Roots are made of carbon, when the grass is eaten above ground, the roots are released in the soil

Oceans absorb CO2 from the atmosphere, carbon is used to build the shells of marine organisms

Taking stored carbon from fossil fuels

Lithosphere

Fossil Carbon

Auto & Factory Emissions
HUMUS

• 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

• 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

• 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 volatilise
    • Reduces BRIX levels - nutrients
URINE as a Fertiliser

• Humans pass say 2 L/day X 365 = 730 L / year

• Dry Fertiliser
  – 5 % as dissolved solids
  – 37 kg recoverable solids
  – 37 kg x 50 million = 1.85 million tons of nutrients

• Liquid Fertiliser
  – Applied at a ratio of 20:1 H2O : Urine
  – 730 x 50 million = 37.5 million tons of liquid applied fertiliser
URINE as a Fertiliser

• 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

Remember the 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