Definitions- Organic soil amendments

- Organic: this context =  
  \textit{supplied or manufactured from living matter (animal or plant) by-products}

- Soil amendment: 
  \textit{Any product that may be added to the soil to improve its quality in some way.}
Other categories:

Mineral soil amendments: *lime, dolomite, gypsum, rock dust*

Microbial soil amendments: *humates, biodynamic preparations, compost tea*

Learning from experience!

### Fig-1 The Environmental Management Systems Model
Background- Soils are alive!

- Increased focus on soil as a living system
- Recent advances in soil biology. Increased ability to identify and count microbes, understand their function. (Genetic tools, imaging molecular and bio-chemical techniques)

Dr. Pauline Mele, DEPI
AgriBio Centre, Latrobe University
Advances in soil biology

The field of soil biology is being revolutionised with the rate of discovery of new species at weekly for bacteria and monthly for fungi (NCBI 2014)


Now a focus on biological functions and roles in key soil processes

Eg.

- Nutrient release
- Pest and disease regulation
- Stability/ erodibility of soils
- Improving soil structure
- Filtering water in the landscape
Soil Management- Understanding Interactions!

Soil Management

- Now a focus on ‘Feeding the soil’- building organic matter levels

- Organic matter- Fraction of the soil made up of anything that once lived (plant and animal remains)

- To build organic matter you need to maximise the addition of new organic materials and minimise the losses (more +++ then --- !)
How to increase Soil Carbon

- **Grow it**
  - Grazing management, stubble management, green / brown manures

- **Spread it**
  - Effluent, manures, old hay, digester slurry, biosolids

- **Make it**
  - Compost

- **Buy it**
  - Organic amendments – above plus any processed or unprocessed organic waste, sawdust, biochar, etc.
Soil Biology

How to manage

- Most important is supply of energy (plant residues, animal manures, composts etc.)

- After that, it is habitat. The habitat should be:
  - as undisturbed as possible,
  - have good water and air supply and equitable temperatures
  - free from toxicities, such as acidity, salt, heavy metals etc

- Finally, diversity of plant species » i.e. rotations to maximise diversity and avoid build up of pests and disease

Identifying limiting factors

Physical?
Chemical?
Biological?
Sub-soil constraints to root growth!

Spatial variability! Nutrient distribution
Soil testing & Interpretation

- Test different soil types separately
- Paddock history, current use - divide up to test separately
- Sampling method - consistency!
- Use ASPAC accredited lab for sample analysis, same lab for consistency
- Seek out good advice, build your knowledge & skills

Useful tools!

- Nutrient budgeting! - advice, courses, excell spreadsheets!
- Farm mapping software, Farm Planning
- Keep records, what products went on, what rate, dates, yield data, observations
- Visual soil assessment (VSA)
Enjoy the day!

Organic Soil Amendments

- Why they are important?
- Soil Management Needs?
- What’s available? How to select
- Rates Quantities
- Soil testing
- Nutrient Budgeting

Biosecurity Protection

Environmental issues

Practicalities Spreading options

Nutrient Budgeting

Soil testing

Rates Quantities