

Track 3

Nutrient sufficiency and management

With thanks to around 50 authors
presenting 16 papers

and some excellent farm visits

Elizabeth Stockdale & Christine Watson

- Are there enough nutrients or is production nutrient limited?
- Are the nutrients in the right place?
 - Spatial and temporal availability
 - Available vs total pools
- We can ask both questions at a range of scales and for a range of systems and the answers are different

CLIMATE

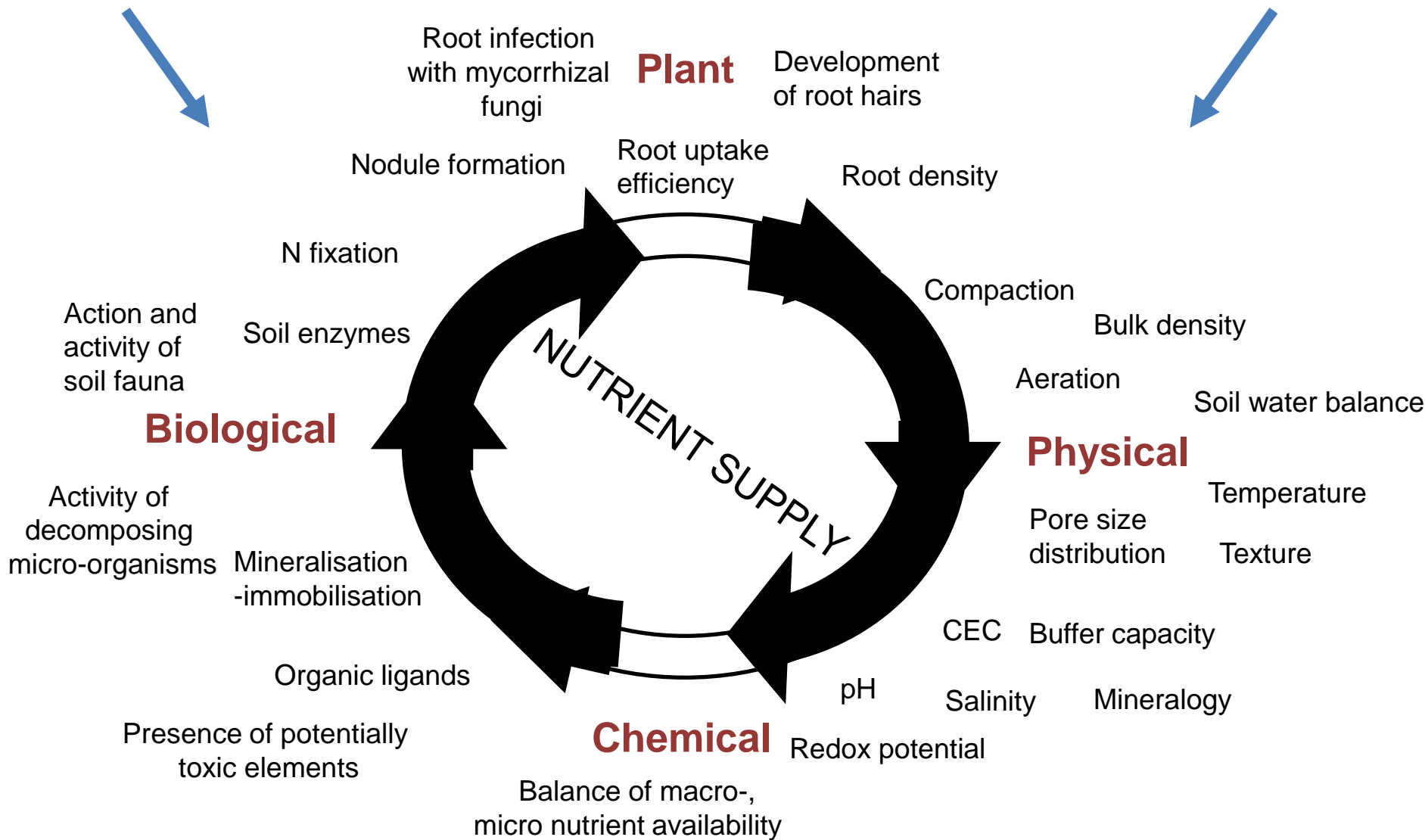
Temperature, rainfall, evaporation

Where impact is mediated by both amount and seasonality

NUTRIENT INPUTS

Fertiliser, manure, deposition etc

where availability is mediated by many of the same factors



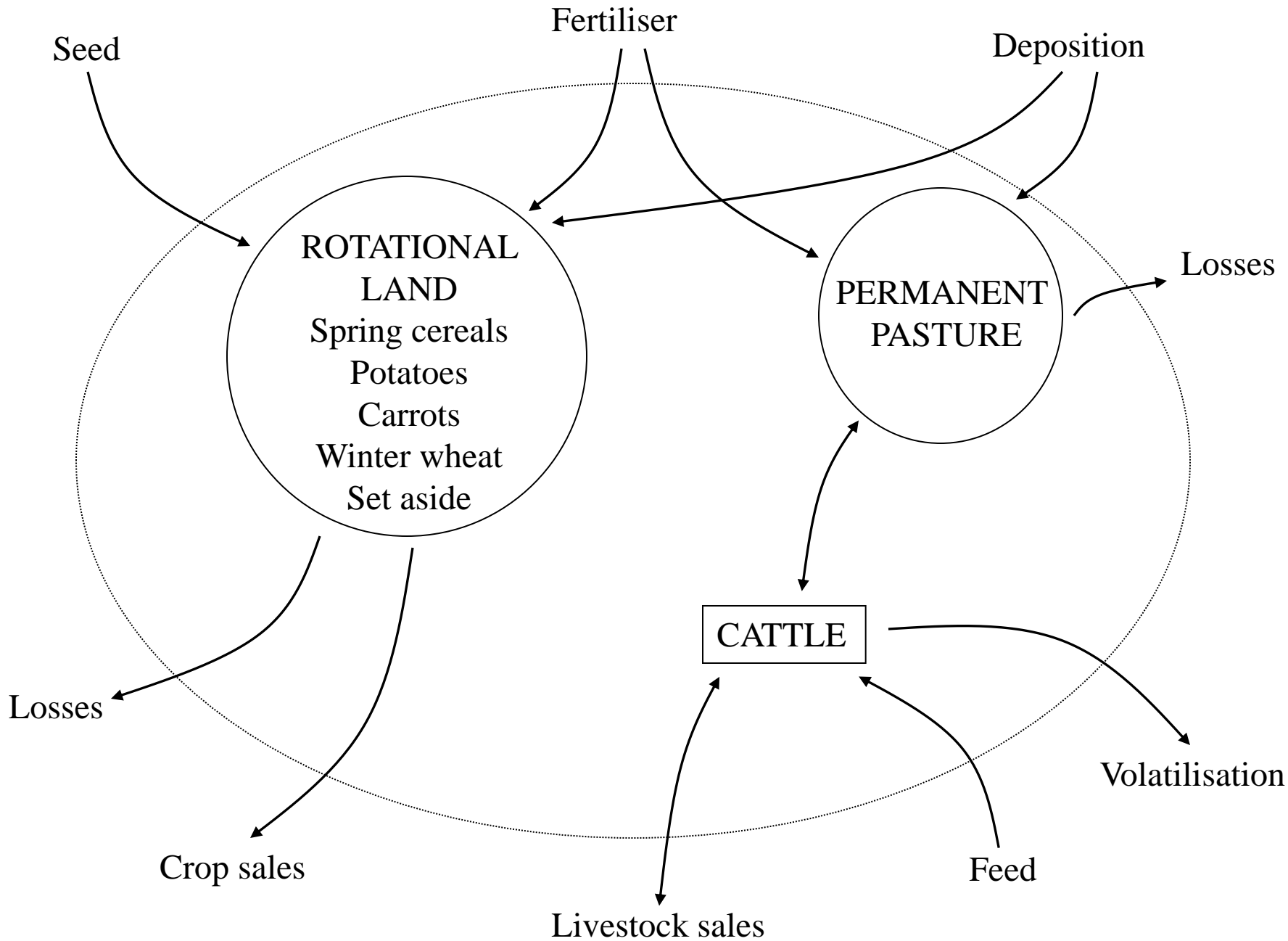
Tools to assess / compare systems

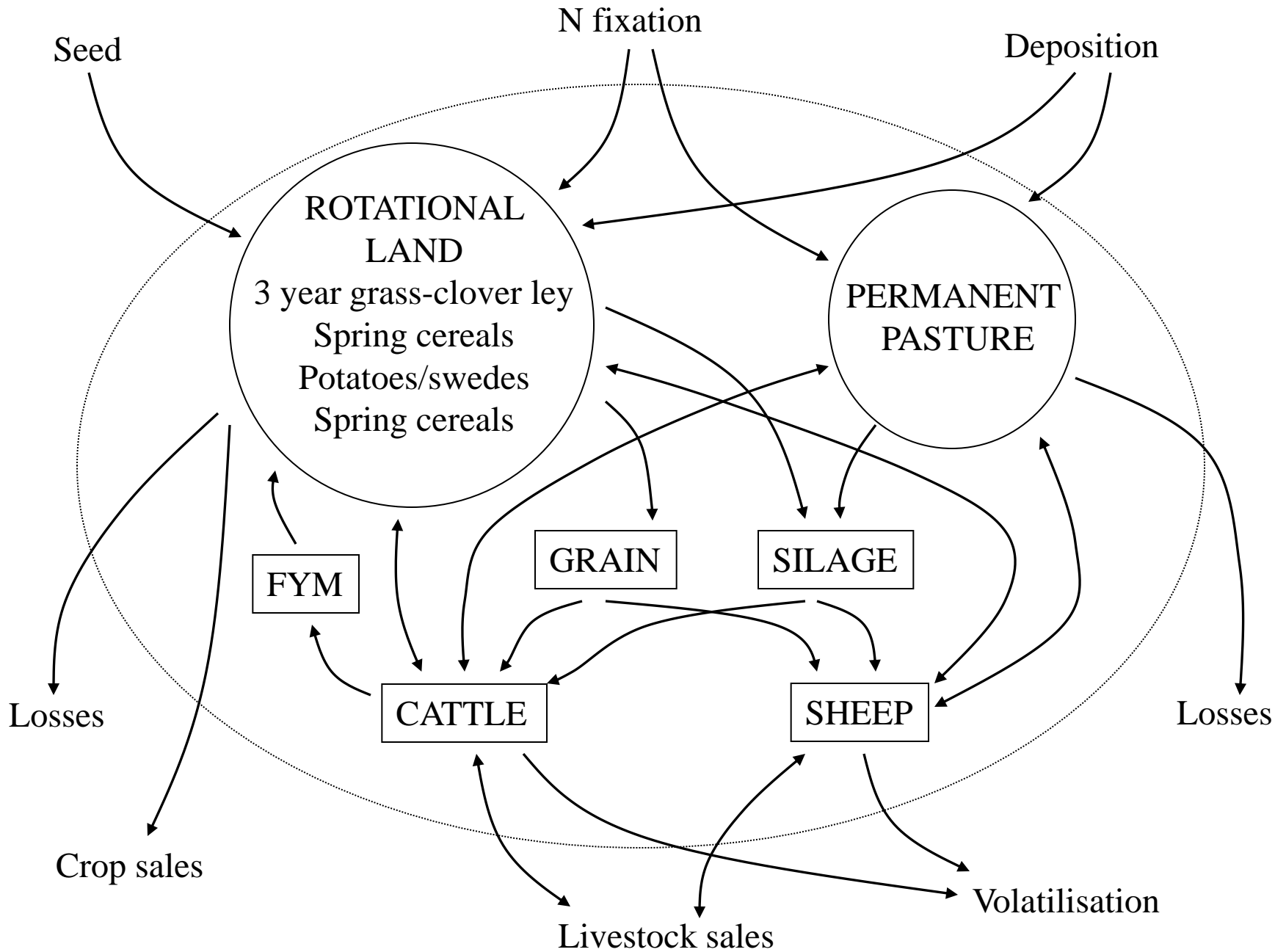
- Measurements (many and diverse)
 - Plant uptake/ offtake
 - **N fixation** (below ground inputs)
 - Soil pools
 - Factors driving release /losses
- Are they useful indicators ?

- Models
 - integrating knowledge for analysis and planning

Internal resources (farm/ regional scales)

- How to increase their “value”?
- Control of nutrient application
- Change of nutrient form / reducing losses
- Contamination / risks associated with transfer between systems/ scales
- *Are stockless organic systems really possible or even desirable???*





Solutions available

- Are they economically viable?
- Are they practically possible within farm system
- Is policy framework supportive? **Sewage**

We were surprised that we didn't talk more about ...

- N₂O emissions
- Soil physical conditions, interactions with rooting and plant uptake of nutrients
- Fitting crops/varieties and nutrient management strategies together

Organic farming systems a driver for change in nutrient management??

- Current drivers affecting nutrient management in conventional systems are not new for organic farming
 - Home produced feed
 - Protein crops for animal feed
 - Cost and availability of all fertilisers
- Organic farmers have been a test-bed for possible solutions needed in current conventional farming, especially but not only, integration of legumes
- Lots of on-farm innovation to develop farm-scale adapted solutions