

10 Strategies for Biological Farming

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Thirty five farmers, land managers and environmental specialists came together on Thursday 15th November at Plumpton College to learn about the links between good soil health and crop yields at the Brighton ChaMP for Water soil and nutrient workshop. The aim of the day was to stimulate thinking about innovative ways to improve groundwater quality through more sustainable land management.

Addressing rising nitrate trends in groundwater is a key part of the Brighton ChaMP project, a partnership between South Downs National Park Authority, Brighton & Hove City Council, the University of Brighton, the Environment Agency and Southern Water, working together with Natural England and the Brighton & Lewes Downs Biosphere. Research into cover crops funded through the project in the South Downs National Park has proven that planting different crops can help reduce nitrogen pollution.

Joel summarises his ten top tips here:

1. Design with Diversity

- Start integrating cover crops, intercrops, herbal leys in arable rotations and more diversity into pastures.

2. Feed Soil Biology

- Root exudates are the preferred food source for soil biology – keep the soil covered with living plants.
- More plant diversity = more diverse root exudates = more diverse and resilient soil microbiology.
- Composts and manures are also of great value to feed biology.

3. Manage Soil Organic Carbon

- Apply – organic amendments.
- Grow – optimise photosynthesis and hence root exudates via plant diversity and complete plant nutrition (ie. macro and micro nutrient management).
- Protect – keep the soil covered, minimise soil disturbance, offset the damage of cultivation with organic amendments and more plant diversity.
- System Redesign – design with diversity (refer strategy 1).

4. Minimise Soil Disturbance(s)

- Start thinking about how to eliminate inversion tillage and transition to min-till systems – at least start this journey by researching/visiting other farmers who have already transitioned. Consider the use of a contractor to trial a few fields first, but no-till on its own is not the answer, use all 3 strategies of conservation agriculture – minimum soil disturbance, keep the soil covered with plants or residues, increase plant diversity.
- Transitioning toward a minimum/no till system may be the ideal, but practicalities may still mean some disturbance at key points in the rotation – no need for dogmas. Do the best you can to ‘minimise’ soil disturbance across the rotation.

5. Remineralisation

- Make sure you look beyond pH, P, K and Mg – also assess S and trace minerals and ensure these other essential minerals are available for plants.
- Many nutrients (esp trace elements) are important synergists for our ‘major’ nutrients – molybdenum for nitrate conversion, nickel for urea conversion, Mo-Fe-Ni-Co-B-Ca for nitrogen fixation.

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6. Reduce Synthetic Inputs

- Too much applied N shuts down the potential of N-fixation, too much applied P shuts down potential of mycorrhizal symbiosis.
- Soluble nutrients make plant roots lazy – both in terms of scavenging soil nutrients as well as their potential to ‘communicate’ to the soil microbiome.
- Artificial inputs are notoriously unstable and inefficient – consider an integrated nutrient management strategy (refer strategy 7).
- Foliar applied nutrients can be an effective strategy to improve nutrient use efficiencies (refer strategy 8).

7. Integrated Nutrient Management

- Integrate as many different sources of nutrients as possible – composts, manures, legumes, biofertilisers and use inputs from the bag when necessary.
- Combine with Carbon – all inputs should be combined with a carbon base – molasses, fulvic acid, humic acid, fish hydrolysates, seaweed extracts, plant extracts.

8. Foliar Management

- Foliar nutrition is ultimately all about indirect stimulation of the soil microbiota. Couple your management strategies to include both seed/furrow inoculants at the start of the season, followed up with foliar applied nutrients.
- Determine your foliar nutrient requirements based on a leaf analysis – don’t guess it, test it. Target your management exactly where your limitations exist.
- Consider urea foliar applications at 4-5% (4-5kg of urea per 100 L of water) during the following crop stages:
 1. Cereals – at anthesis + 2 weeks
 2. OSR – mid-end of flowering
 3. Pulses – use a 1-2% urea solution at pod set.
- Other foliar inputs to prime the plants immunity against pests and disease is an emerging part of an IPM strategy – biostimulants, biofertilisers, plant extracts/essential oils and silicon have all demonstrated potential.

9. Livestock Integration

- Reintroduce livestock if possible – use rotational herbal/fertility leys in an arable system.
- Consider a flying flock if you are not ready for livestock – can you pair up with your neighbour?
- If you already have livestock, increase pasture diversity, consider holistic grazing.

10. Systems Thinking

- Consider the bigger picture, don’t try and manage a whole system by only understanding a few pieces of the puzzle. Do some reading on systems thinking and holistic management.
- Intentionally design your farming system by utilising strategies 1-9. There are no silver bullets, take a systems approach and use many strategies as an integrated approach.
- Don’t forget the social-cultural considerations – attend more events, network farmer to farmer, start a discussion group, join twitter and watch and learn.
- Biological farming is knowledge intensive, not input intensive. Always keep learning.

Find out more at:

www.southdowns.gov.uk/brighton-champ-for-water/

<https://www.integratedsoils.com/>