

Kicking the Nitrogen Habit

Tips for reducing your nitrogen costs

Bagged nitrogen prices are through the roof and are likely to increase for the short-term at least, as well as staying high for a good period. In addition, synthetic N is one of the largest contributors to climate change through NOx emissions and water pollution. Reducing your synthetic nitrogen footprint is a win-win.

Regenerative agriculture producers have reduced their dependence on nitrogen inputs significantly, while also increasing profits and maintaining respectable yields.

The challenge is maintaining yield and protein content in the transition period.

Here are some tips for achieving this:

1. Never Apply N Alone. Always Go for Green and Black(s)

- Apply *all* soluble N materials with a carbon source at (3-5% by vol)
 - Humic granules
- Apply slurry with a carbon source (humics)
- Apply N with trace elements
- Apply N with sulphur (10:1 N:S?), moly & calcium
 - Calcium ensures robust (less susceptible) extension growth
- Apply with seaweed (low dose)

2. Sell the Spreader (avoid soil contact for synthetics)

- Go in-furrow rather than surface applied
- Modify- or source seed drills that can apply targeted materials

3. Don't Over Apply (complete proteins please)

- Over application of soluble N creates unhealthy plants, that are pest and disease susceptible
- Apply nitrogen at growth stages where it's most needed. Only a small amount is actually needed for growth.
- Soluble fertilised plants don't feed microbes
- Excess soil applications cause deficiencies in other nutrients (by inhibiting uptake) eg potassium/calcium
- Shift to liquid application methods where possible
- Excess N in forages raises non-protein nitrogen contributing to poor health and even bloat

CARBON SOURCES

Fulvic acids

Foliar & soil applied
Universal tank mix compatibility

Humic acids

Foliar & soil applied
Limited tank mix compatibility

Molasses

Foliar & soil applied
Good compatibility but sticky

Compost

Foliar & soil applied
Universal compatibility - needs screening

4. Substitute N Forms for Greater Efficiency & Less Harm

- Prefer amide forms of nitrogen over nitrates (optimise protein synthesis efficiency), plants don't need/can't use nitrates
- Use organic N instead of synthetic where possible, eg: fish hydrolysate, amino acids (all aminos contain energy for the plant, along with N, while having no energy cost to the plant – as nitrate and ammonium do)
- Make best use of fertility from manures, by fermenting or composting carefully
- Apply good quality compost extracts to grasslands and crops with a calcium source

5. Go Foliar (use less product)

- Maximise use-efficiency by applying synthetic/available N sources directly to leaf
- Apply foliar materials with a carbon source: fulvic acid or molasses/compost (for organics)
- Apply with calcium, boron, silicon and traces
 1. Eg calcium nitrate & humic acid
- Apply with seaweed (at a low rate)
- Use amide nitrogen forms (urea etc) or organic N (fish hydro)

6. Only Apply What's Needed

- N is rarely the only (or even main) obstacle to growth, water is though
- Minimise or eliminate N application rates at seeding
- Test your soils/plant sap, to establish whether there is a need.
- Prefer trace elements and major nutrients over N, especially calcium
- Some N is needed for photosynthesis

7. Give Plants the Best Chance They Can Get

- “Bioprime” seeds: coat seeds with biology, foods/carbon, trace elements (salt, seaweed etc) and biostimulants (seaweed, fish hydro)
- Apply in-furrow trace elements and nutrients, especially: calcium, boron, magnesium, moly & manganese (based on a soil test if possible)

8. Improve your Soil (Aggregate) Structure

- Promote soil aggregate structure to: maximize homes for free-living N-fixers, water capture/retention
- Compacted soils leak N and don't absorb water
- Rip n Drip to relieve compacted soils & feed organisms

9. Maximise Biological Nitrogen Fixation (Free Nitrogen Sources)

- Diversify plantings and rotations to foster below ground microbial diversity and nutrient cycling
- Maintain adequate levels of molybdenum and cobalt to ensure fixation

10. Get Your Soil Biology Working (Cycle That Locked-Up Nitrogen)

- Promote predatory microorganisms (protozoa & nematodes) to harvest your bacterial populations and produce manure (plant available N)
- Apply protozoa tea to your soils to increase release (cycling) of bacterial nitrogen
- Promote worm populations in soil

11. Upcycle Manure Materials (Where There's Muck There's Brass)

- Ferment all slurries for maximum benefit. Raw slurry contains a lot of available N which readily leaches, kills earthworms and suppresses nitrogen fixation in legumes
- Improve FYM by bokashi composting
- Apply macerated bokashi FYM materials as a liquid tonic to grass or soil

12. Make & Apply the Best Quality Composts You Can (Nature's Secret Fertiliser)

- Woodchip compost
- Worm compost (fungally dominant)

13. Increase Photosynthesis (Raise Plant Brix)

- Foliar apply key elements to ensure maximum photosynthetic activity
- MINMPS
 - i. Mag, Iron, N (trace), Mang, Phos, Sulphur
- The healthy plant can get its own nitrogen

14. Plant Mixtures (Go Team!)

- Get the team on the case (legumes etc)
- Mixtures out-yield straights