



“...Nitrogen is elemental to life. It's the essential building block of the plants we eat. Farmers remove it from the soil when they harvest the year's crop, and they must replenish it for the following year's. Compared with water and fuel, nitrogen is actually in one sense quite plentiful: it makes up about 80 percent of the air we breathe.

Yet for all that ..., it's also in a sense scarce: it's extremely strong chemical bond -- it exists in the air in triple-bonded pairs of nitrogen known as N₂ -- makes it difficult for plants to use”. Tom Philpott*

Part 2

Strategies to reduce the use of synthetic nitrogen

1. GMO technology

Peter Vitousek, a professor of biology at Stanford and a leading ecologist says "There may be something there, but honestly, I think gains (in nitrogen-use efficiency) will be marginal," He explained that the process by which plants utilise nutrients is much more complex, and involves multiple genes working together, making it unlikely that a single gene could be a game changer. "Plants have been evolving for millions of years," he said. "I doubt that plant breeders will be able to hit upon anything for nutrient utilisation that nature already hasn't tried."

2. Change farmers' growing practices.

Can farmers use less nitrogen and align their nitrogen applications more closely with their crops' needs, perform more soil testing, try applying a little less and see if yields hold steady? Even so, conventional farmers using best practices will still leak away 40 percent of the nitrogen applied, according to research.

3. Change our eating habits

Conventional cropping systems rely heavily on applications of synthetic nitrogen. Animals consume a lot of the grain production. If we move away from eating grain fed meat and restrict what meat we do eat to livestock in more natural pasture-based systems, we would greatly ease the demand for synthetic nitrogen.

Strategies to make use of atmospheric nitrogen

1. Use organic practices which use no synthetic nitrogen

In organic agriculture farmers apply no synthetic nitrogen, relying instead on organic nitrogen from mainly the healthy soil functioning soil microbes, by making use of animal manures and nitrogen-fixing legume cover crops. Where synthetic nitrogen gives the plant a burst of energy, organic nitrogen releases slowly and is therefore better matched to a plant's needs than is synthetic. The crop pulls up much of the excess nitrogen, keeping it in the paddock for the next planting, instead of letting it run off into waterways or entering the atmosphere as climate-warming nitrous oxide.

2. Eliminate or at least reduce the use of products that severely affect soil life

When farmers stop using harmful chemicals and start to buffer their effect with fulvic or humic acids or compost teas the soil life can function and the soil microbes can do their job.

Farming Secrets says: Organic agriculture maintains nutrient balance in the soil

*Acknowledgements to The N of an era: America's nitrogen dilemma—and what we can do about it