



FREQUENTLY ASKED QUESTIONS ON FERTILIZER

common ground
myths and realities





Most people know little (if anything) about fertilizer and farming or, for that matter, how food gets to their table. This isn't surprising, since fewer than one in 40 Americans lives on a farm today versus one out of four a few generations ago.

So when claims are made against commercial fertilizer — whether they stem from misinformation, faulty projections or outright lies — many people accept them as true.

At the recent PotashCorp-sponsored Fertile Minds Ideas Expo, a panel of recognized experts discussing these issues provided numerous facts and explanations that can help set the record straight and, in the process, ease the way for farmers to provide nutritious, affordable food for a world in need.



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MYTHS & REALITIES

Myth:

“Aren't commercial fertilizers chemicals . . . harmful to wildlife, the environment and people?”

Reality:

- Fertilizers are natural-born nutrients that plants can digest: “plant food.”
- Nutrients in fertilizers are the same as those in foods we eat and in our bodies.
- Fertilizers are not toxic. In fact, these nutrients are in the ground we walk on and the air we breathe.

Myth :

“But commercial fertilizers are manufactured by companies.”

Reality:

- The main nutrients in most fertilizers — nitrogen, phosphorus and potassium — come from the land and the air. They are not man-made; they exist in Nature. Nitrogen (scientific chemical symbol “N”) comes from the air. In fact, 78 percent of the air we breathe is nitrogen. Phosphorus (scientific chemical symbol “P”) is fossil remains found in the soil. It is mined from beds of phosphate rock. Potassium (scientific chemical symbol “K”) is ‘salts’ evaporated from sea water. It is mined from deposits in the earth. In essence, fertilizer companies convert N, P and K nutrients into usable form for plants. See, plants need a balanced diet, just as we do. Nitrogen (N) is a key element in protein (16 percent of the protein in our bodies) and, like us, plants need it to grow. Phosphorus (P) is a mineral needed for energy in plants. It works like carbohydrates in people. Potassium (K) is a mineral that helps plants fight stress and disease, and prevent injury. Like calcium helps us build strong bones, potassium helps plants grow strong stalks.



Myth:

“If nutrients are in the ground and air, why add more?”

Reality:

There are two issues to address here.

- First of all, farmers aren’t “adding” nutrients; they’re replacing those taken away by crops.
 - As plants grow during the season, they “mine” the nutrients they need from the soil.
 - At harvest, those nutrients “go to market” with the crop, leaving a shortage for next season.
 - Fertilizing completes the cycle — recycling nutrients back to the land for new crops to use.
- Secondly, plants can’t digest nutrients “as is;” they must be converted into usable form, and most plants can’t do that.
- Furthermore, while nitrogen in air is everywhere, major phosphorus and potassium supplies are far from the best cropland.
- In sum: Nature created the nutrients. Fertilizer companies make them digestible for plants and help farmers put them where they can produce the most food.

Myth:

“Why not let Nature provide? Soils naturally contain all the nutrients plants need.”

Reality:

Not true. Soils do not naturally contain all the nutrients needed. And, soils with some of those nutrients may not be where the best crops are grown.

Nutrients in fertilizers are the same as those in foods we eat and in our bodies.

- While Nature can provide to a limited degree, it takes many years — even decades for organisms in the soil to build up enough nutrients for a decent crop yield.
- If we grow crops in virgin soil, in a single season the crops can mine many years' worth of naturally produced nutrients.
- Historically, American pioneers could “Go West” as soil nutrients were depleted . . . an option that ended long ago.

Bottom line: Nature needs help.

Myth:

“Organic farmers don’t use fertilizers.”

Reality:

- Correction: organic growers usually do use fertilizer — but in a form such as manure from livestock, rather than conventional commercial types. (Nature needs help in “organic” operations, too.)
- Fertilizer nutrients are the same, whether “organic” or commercial.

Myth:

“If nutrients are the same, why not go ‘all natural’?”

Reality:

Two big reasons are:

- There isn’t enough natural fertilizer to meet high-yield farming demands. To even get close to enough would require millions of acres in addition to those that farmers use now.
- Natural fertilizer does not provide a balanced diet for plants.
 - In livestock manure, for instance, the concentration of nitrogen (N), phosphorus (P) and potassium (K) can vary widely — both in terms of how much of these nutrients is in the manure, as well as the N-P-K ratio.
 - Applying enough manure to provide adequate nitrogen (N) for corn, over time could likely add 4-5 times as much phosphorus (P) as the crop requires.

In short, it’s virtually impossible to closely match fertilizer nutrients with crop needs using only manure. And it’s easy to “naturally” over- or under-fertilize.



Myth:

“Organic farming protects the environment, wildlife and habitats; conventional farming doesn’t.”

Reality:

In either type of farming operation, responsible and efficient fertilizer use poses no real threat to any of the above. The quantity and quality of food provided by conventional farming has enabled our growing population to eat better for decades... without farmers using more land for crops. On the other hand, millions of additional acres would be needed if we relied on organic methods — and we’d have less food.

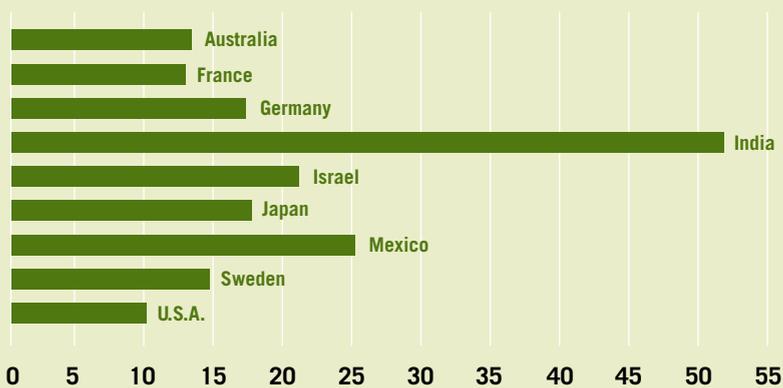
Myth:

“Crop yields using organic methods are about the same as with conventional farming.”

Reality:

- Rarely, if ever. Typically, organic crop yields are only one-third to one-half as high as those from farms using conventional methods and commercial fertilizers.
- The cost to produce organic food (per pound, bushel or ton) is usually much higher too... a key reason why organic foods are more expensive to buy.

Percentage of people’s income spent for food



Nutritious, affordable food: Commercial fertilizer is a key reason why people in the USA spend less for food than any other nation on earth. Without it, food would cost all of us much more. *Source: United Nations System of National Accounts



There are 16 million square miles of wilderness habitats world-wide. Without commercial fertilizer, there would be zero.

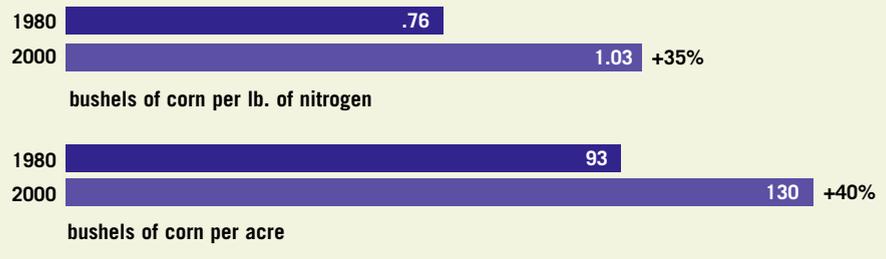
Conventional farming practices and commercial fertilizers have helped feed the world while saving habitats that would otherwise have to be used for crops. In fact, during the last 40 years, North American farmers actually used less land while tripling food production.



Overall, farmers use less commercial fertilizer now than in 1980.

More bang for the buck with commercial fertilizers

Farmers now produce one-third more corn for each pound of nitrogen applied than 20 years ago.



Myth:

“Organically grown food is safer, healthier and more nutritious.”

Reality:

Many people have that impression because words like “natural” and “organic” have come to mean “good and good for you”.

- There is, however, no proof of nutritional superiority.
- Even leaders of groups such as the Organic Trade Association and knowledgeable organic growers themselves make no such claim — with good reason: there is no solid evidence to support it.



Myth:

"America is awash in fertilizer and farmers keep pouring it on."

Reality:

- On the contrary, tests show that nearly half of America's most productive soils lack the nutrients to sustain current yields.
- Not only that, farmers have been depleting soil nutrient reserves rapidly in recent years.
- Last year they applied:
 - only 75 percent of the phosphorus that crops removed
 - and only 50 percent of the potassium mined by crops.

Overall, farmers use less commercial fertilizer now than in 1980. For instance, nitrogen usage peaked in 1994 and phosphorus' apex was in 1977.



Without commercial fertilizer the world would be without forests, wildlife habitats and leisure areas.

Myth:

“But crop yields are increasing, which proves that farmers have been ‘pouring it on.’”

Reality:

Not at all. It's true, of course, that:

- North American farmers have tripled yields on essentially the same acreage since 1960.
- And last year U.S. growers used slightly less nitrogen to produce over 50 percent more corn than in 1980.

Fact is, however, simply applying more fertilizer isn't the answer — and it never has been.

Along with hybrid seed varieties and other items contributing to higher yields, overall resource and nutrient management practices are a driving force.

New and improved practices range from soil sampling and tillage methods, to the use of starter fertilizers, more-precise fertilizer placement and application timing.

Myth:

“High-yield farming sounds like ‘more fertilizer for more bushels’ is all that growers care about.”

Reality:

Farming is a business — a livelihood.

Think of farmland as a food manufacturing plant. To achieve the highest Return On Investment (ROI), farmers don't want more seed than they need or more fertilizer than this season's crop can use because it all costs money. Conventional farming methods and commercial fertilizers make it possible.

They provide, in a word: control.

Starting with soil testing, growers now can exercise unprecedented control over:

- how much fertilizer is applied
- the relative amount of each nutrient (suppliers can customize “40-20-20, 10-10-10, 30-0-30” or other field- and crop-specific N-P-K blends)
- how much goes where within each field using GPS (Global Positioning Satellite) systems and equipment
- application timing and placement (starter fertilizers, for instance, with 2x2 banding to put fertilizer two inches alongside and two inches below the seed.)



Myth:

“Runoff from commercial fertilizers is poisoning rivers and coastal waters, causing ‘hypoxia,’ creating ‘dead zones’ and destroying sea life.”

Reality:

Several points could be made here. First, an explanation:

Hypoxia (lack of oxygen in water) can stem from “algae blooms,” which often are blamed on fertilizer runoff. Hypoxic waters create so-called “dead zones” for various seafood species and allegedly are destroying commercial fishing.

Addressing allegations:

While there are links between runoff and algae, many questions remain regarding these related problems. For example:

- Various contributing factors:
 - Other sources of algae-inducing elements (such as sewage from cities and towns) may well exceed fertilizer-generated quantities
 - Other factors, including:
 - siltation from urban development (it blocks light and prevents sea grasses from growing)
 - parasite infestations (reduced oyster catches by 90 percent)
 - overharvesting (a key factor in blue crab industry woes).



The quantity and quality of food provided by conventional high-yield farming has allowed a growing population to enjoy unprecedented abundance for decades, without farmers having to use additional land for crops. Literally, millions more acres would be needed if we relied on less productive methods — and we'd also have less food.



• Questionable cause-and-effect:

While much recent focus has been on the Gulf of Mexico it is interesting to note:

- the hypoxic area at the mouth of the Mississippi has increased — even though fertilizer usage and runoff has decreased
- many offshore areas are “naturally” hypoxic, with no fertilizer impact
- far less fertilizer washes down river now than in pioneer days when massive herds of buffalo roamed.

There is also the obvious reminder that just as plant nutrients are the same whether in organic or commercial fertilizer — runoff is runoff, regardless of its source.

Also, lack of control in organic fertilizer content, application timing, placement and such can increase the potential for runoff.



Food production will need to double in the next 20 or so years in order to provide global food security.

World population — now about 6 billion — will grow to over 8 billion by 2025.

Pointing out steps to prevent runoff:

Conventional farmers prevent and reduce runoff through a host of technology, including:

- buffer zones, which can reduce nitrates in runoff as much as 70 percent
- minimum and no-till farming methods
- control of commercial fertilizer application by measuring overall quantities, N-P-K ratio and timing of application and placement for fullest, most effective plant usage.

In addition, farmers employ practices that include soil testing, custom fertilizer blends, GPS systems and starter fertilizers.

In short, conventional farming practices using commercial fertilizers enable growers to fertilize for top yields while avoiding excess fertilizer application.

Myth:

“We could feed the world without commercial fertilizer.”

Reality:

Without commercial fertilizer the world would be:

- without one-third of its current food supply
- without forests, wildlife habitats and leisure areas
- without wetlands, buffer zones and other marginal land not presently farmed
- without funds for many things we now have, because we’d need a lot more money for food.

In short, without commercial fertilizers we’d be without much of the quality of life we enjoy today.

Why? Simple:

- At least one-third of global food supplies is a direct result of commercial fertilizer use.
 - Even so, one out of three people in the world today lacks what some global food industry observers refer to as “food security:” they cannot grow or afford to buy enough food.
- World population — now about 6 billion — will grow to over 8 billion by 2025, which means food production will need to double in the next 20 or so years in order to provide global food security.
- Trying to match even current supplies without commercial fertilizer would require using every available non-urban acre of land — plowing down all forests, wildlife habitats, leisure areas and more.



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The Fertilizer Institute

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