

fertilizer is GOOD

Fertilizer is a substance added to soil to improve plants' growth and yield. First used by ancient farmers, fertilizer technology developed significantly as the chemical needs of growing plants were discovered. Modern synthetic fertilizers are composed mainly of nitrogen, phosphorous, and potassium compounds with secondary nutrients added. The use of synthetic fertilizers has significantly improved the quality and quantity of the food available today, although their long-term use is debated by environmentalists.

Like all living organisms, plants are made up of cells. Within these cells occur numerous metabolic chemical reactions that are responsible for growth and reproduction. Since plants do not eat food like animals, they depend on nutrients in the soil to provide the basic chemicals for these metabolic reactions. The supply of these components in soil is limited, however, and as plants are harvested, it dwindles, causing a reduction in the quality and yield of plants.

Fertilizers replace the chemical

components that are taken from the soil by growing plants. However, they are also designed to improve the growing potential of soil, and fertilizers can create a better growing environment than natural soil. They can also be tailored to suit the type of crop that is being grown. Typically, fertilizers are composed of nitrogen, phosphorus, and potassium compounds. They also contain trace elements that improve the growth of plants.

STARTER FERTILIZER

Starter fertilizer is defined as “the placement of small quantities of nutrients in a concentrated zone in close proximity to the point of seed placement at the time of planting.” This placement can be in a band over the row, in the furrow, below the seed, to the side of the seed, or to the side and below the seed. A disadvantage of placing starter fertilizer over the row is that the immobile nutrients are not positionally available to early root growth.

Starter fertilizer is applied in addition to nutrients applied to correct soil nutrient deficiencies. It should not be confused with fertilizer placed in a band near the row to correct a soil nutrient deficiency. Band application of fertilizer is an effective way to correct nutrient deficiencies and can result in early

growth response as well. Band application of phosphorus fertilizer on low phosphorus soils is suggested for corn and grain sorghum to maximize fertilizer use efficiency.

Placement of starter fertilizer in the seed furrow, commonly called “pop-up,” requires care to prevent germination injury from fertilizer salts. Metering equipment must function properly to deliver uniform low rates of fertilizer in the seed furrow. The amount that can be applied safely is limited (usually less than 5-7 lbs per acre of N plus K in-furrow), and depends on the fertilizer used and soil properties. Ammonium thiosulfate (12-0-0-26S) should never be placed in the furrow with the seed.

A starter fertilizer usually is composed of two or more nutrients. The most common fertilizer is combination of nitrogen and phosphorus often constitutes an effective starter material. Liquid 10-34-0 is a popular starter fertilizer material.

TYPES OF FERTILIZER

Organic vs Chemical

The chemical fertilizer is man made to have the vital nutrients of mainly NPK that are essential for the plant growth. Basically, the chemicals are collected according to the NPK content of those chemicals and normally released into the soil to meet

	Nitrogen (N)	Phosphorus (P ₂ O ₅)	Potassium (K ₂ O)	Calcium (Ca)	Magnesium (Mg)	Organic Matter	Moisture Content
FRESH MANURE	%	%	%	%	%	%	%
Cattle	0.5	0.3	0.5	0.3	0.1	16.7	81.3
Sheep	0.9	0.5	0.8	0.2	0.3	30.7	64.8
Poultry	0.9	0.5	0.8	0.4	0.2	30.7	64.8
Horse	0.5	0.3	0.6	0.3	0.12	7.0	68.8
Swine	0.6	0.5	0.4	0.2	0.03	15.5	77.6
TREATED DRIED MANURE	%	%	%	%	%	%	%
Cattle	2.0	1.5	2.2	2.9	0.7	69.9	7.9
Sheep	1.9	1.4	2.9	3.3	0.8	53.9	11.4
Poultry	4.5	2.7	1.4	2.9	0.6	58.6	9.2

the needs of the plants growing there. They give the plant immediate food and they do grow fast, but don't last long. These fertilizers were introduced in the early 1900s to help the farmer produce more food. Over a period of time it has led to a build-up of soil salts and other contaminants that have the potential to run off into the waterways.

A fertilizer that is derived from animal or vegetable matter. Matter that 'mother nature' has been using for millions of years to nourish the earth. It is a fertilizer that is slow release but spreads many nutrients other than the big three of NPK. It feeds the soil not only the plant, like chemical fertilizers, which will stick around for years and years. Feeds microorganisms, worms, beneficial insects and many more. Organic fertilizers are not harmful to pets, livestock and human exposure.

Manure, Green

In agriculture, a green manure is a type of cover crop grown primarily to add nutrients and organic matter to the soil. Typically, a green manure crop is grown for a specific period, and then plowed under and incorporated into the soil.

Green manures usually perform multiple functions, that include soil improvement and soil protection:

- Leguminous green manures such as clover and vetch contain nitrogen-fixing symbiotic bacteria in root nodules that fix atmospheric nitrogen

in a form that plants can use.

- Green manures increase the percentage of organic matter (biomass) in the soil, thereby improving water retention, aeration, and other soil characteristics.
- The root systems of some varieties of green manure grow deep in the soil and bring up nutrient resources unavailable to shallower-rooted crops.
- Common cover crop functions of weed suppression and prevention of soil erosion and compaction are often also taken into account when selecting and using green manures.
- Some green manure crops, when allowed to flower, provide forage for pollinating insects.

Historically, the practice of green manuring can be traced back to the fallow cycle of crop rotation, which was used to allow soils to recover.

Manure, Composted

An efficient compost process will stabilize the breakdown and loss of valuable nutrients in the manure. The stabilized nutrients can then be made available for future plant growth. Fresh manure tends to lose its' valuable nutrients into the air and water when the C:N ratio is out of balance or when the pile is exposed to uncontrolled amounts of rain water. Leaching nitrogen compounds can have a negative impact on nearby bodies of water and produce nuisance odors.

Manure is an excellent fertilizer containing nitrogen, phosphorus,

potassium and other nutrients. It also adds organic matter to the soil which may improve soil structure, aeration, soil moisture-holding capacity, and water infiltration.

To determine

how much manure is needed for a specific application, the nutrient content and the rate nitrogen becomes available for plant uptake needs to be estimated. Nutrient content of manure varies depending on source, moisture content, storage, and handling methods.

Nitrogen content in manure varies with the type of animal and feed ration, amount of litter, bedding or soil included, and amount of urine concentrated with the manure. Moisture content is also a major consideration. For example: The moisture content of fresh manure is around 70% to 85%. The moisture content of air-dried manure is around 9% to 15%. As manure dries, the nutrients not only concentrate on a weight basis, but also on a volume basis due to structural changes (settling) of the manure. Volatilization of urine nitrogen can result in considerable loss of nitrogen, up to 50% or more of the total nitrogen.

Excess or uncontrolled use can spoil the soil properties, osmotic pressure, pH, conductivity and water holding capacity. It may also affect adversely on population of micro-organisms and other parameters.

Problems with over application

The issue of over application can lead to an excess build-up of nutrients, such as phosphorus. This condition may occur when manure and fertilizer are applied each year. One of the resulting issues is usually a build-up of excess phosphorus which can limit future crop growth as well as prevent future applications of manure.

Corrective Actions

One corrective action to the over application of fertilizer is to rely on the soil testing to determine how much should be applied in the next crop cycle. TerraOne can provide a long term solution to the high build-up in the field.

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- Works immediately
 - Contains all necessary nutrients that are ready to use
 - Affordable
 - Convenient to use

- Leeching can happen
- Some are not affordable
- Accumulation of salts
- Too much is not a good thing