

FERTILIZERS AND PESTICIDES

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FERTILIZERS

A fertilizer or fertiliser (in British English) is any material of natural or synthetic origin (other than liming materials) that is applied to soils or to plant tissues (usually leaves) to supply one or more plant nutrients essential to the growth of plants. This also depends on its soil fertility as well as organic things such as humic acid, seaweed and worm castings.



MECHANISM

- Fertilizers enhance the growth of plants. This goal is met in two ways, the traditional one being additives that provide nutrients. The second mode by which some fertilisers act is to enhance the effectiveness of the soil by modifying its water retention and aeration. This article, like most on fertilizers, emphasises the nutritional aspect. Fertilizers typically provide, in varying proportions.
- Three main macronutrients:
 - Nitrogen (N): leaf growth;
 - Phosphorus (P): Development of roots, flowers, seeds, fruit;
 - Potassium (K): Strong stem growth, movement of water in plants, promotion of flowering and fruiting;

PRODUCTION

- ❑ Nitrogen fertilizers
- ❑ Phosphate fertilizers
- ❑ Potassium fertilizers
- ❑ Compound fertilizers
- ❑ Organic fertilizers
- ❑ Other elements: calcium, magnesium, and sulfur

EFFECTS OF FERTILIZERS

1. Effects on Soil

2. Effects on Water

3. Effects on Atmosphere

4. Effects on Food Quality

5. Effects on Human health & Cattle

6. Effects on the Quality of the Crops





WATER



SOIL



ATMOSPHERE

ENVIRONMENTAL EFFECTS OF FERTILIZERS ON WATER, SOIL, ATMOSPHERE .

EFFECTS OF FERTILIZERS ON WATER

- Agricultural run-off is a major contributor to the eutrophication of fresh water bodies. For example, in the US, about half of all the lakes are eutrophic. The main contributor to eutrophication is phosphate, which is normally a limiting nutrient; high concentrations promote the growth of cyanobacteria and algae, the demise of which consumes oxygen.^[22] Cyanobacteria blooms ('algal blooms') can also produce harmful toxins that can accumulate in the food chain, and can be harmful to humans.
- The nitrogen-rich compounds found in fertilizer runoff are the primary cause of serious oxygen depletion in many parts of oceans, especially in coastal zones, lakes and rivers. The resulting lack of dissolved oxygen greatly reduces the ability of these areas to sustain oceanic fauna.^[23] The number of oceanic dead zones near inhabited coastlines are increasing. As of 2006, the application of nitrogen fertilizer is being increasingly controlled in northwestern Europe^[24] and the United States.^{[24][25]} If eutrophication can be reversed, it may take decades^[citation needed] before the accumulated nitrates in groundwater can be broken down by natural processes.

EFFECTS OF FERTILIZERS ON SOIL

- Acidification

Nitrogen-containing fertilizers can cause soil acidification when added.^{[42][43]} This may lead to decreases in nutrient availability which may be offset by liming.

Steel industry wastes, recycled into fertilizers for their high levels of zinc (essential to plant growth), wastes can include the following toxic metals: lead^[65], arsenic, cadmium,^[65] chromium, and nickel. The most common toxic elements in this type of fertilizer are mercury, lead, and arsenic.^{[66][67][68]} These potentially harmful impurities can be removed; however, this significantly increases cost. Highly pure fertilizers are widely available and perhaps best known as the highly water-soluble fertilizers containing blue dyes used around households. These highly water-soluble fertilizers are used in the plant nursery business and are available in larger packages at significantly less cost than retail quantities. There are also some inexpensive retail granular garden fertilizers made with high purity ingredients.

EFFECTS OF FERTILIZERS ON ATMOSPHERE

- Through the increasing use of nitrogen fertilizer, which was used at a rate of about 110 million tons (of N) per year in 2012, [84][85] adding to the already existing amount of reactive nitrogen, nitrous oxide (N_2O) has become the third most important greenhouse gas after carbon dioxide and methane. It has a global warming potential 296 times larger than an equal mass of carbon dioxide and it also contributes to stratospheric ozone depletion. [86] By changing processes and procedures, it is possible to mitigate some, but not all, of these effects on anthropogenic climate change. [87]
- Methane emissions from crop fields (notably rice paddy fields) are increased by the application of ammonium-based fertilizers. These emissions contribute to global climate change as methane is a potent greenhouse gas. [88][89]

Problems from fertilizers can be diminished by following these guidelines:

- Use pesticides and fertilizers sparingly. When use is necessary, use these chemicals in the recommended amounts. Read the label. More application does not mean a greener lawn - it means more watering and mowing.
- Water the lawn with about 1/4-inch to 1/2-inch of water after a fertilizer application. This helps move the fertilizer into the soil and reduces the potential of being lost in stormwater runoff.
- Never apply fertilizers if a heavy rain is anticipated.
- If you spill fertilizers, sweep them up, do not hose or sweep them into the streets and storm drains.

Pesticide



Pesticides are substances meant for attracting, seducing, and then destroying any pest.^[2] They are a class of bioicide. The most common use of pesticides is as plant protection products (also known as crop protection products), which in general protect plants from damaging influences such as weeds, fungi, or insects. This use of pesticides is so common that the term pesticide is often treated as synonymous with plant protection product, although it is in fact a broader term, as pesticides are also used for non-agricultural purposes. The term pesticide includes all of the following: herbicide, insecticide, insect growth regulator, nematicide, termiticide, molluscicide, piscicide, avicide, rodenticide, predacide, bactericide, insect repellent, animal repellent, antimicrobial, fungicide, disinfectant (antimicrobial), and sanitizer.^[2]

TYPES OF PESTICIDES

- ❑ Organophosphate pesticides
- ❑ Carbamate pesticides
- ❑ Organochlorine insecticides
- ❑ Pyrethroid pesticides
- ❑ Sulfonylurea herbicides
- ❑ Biopesticides
- ❑ Classified by type of pest
- ❑ Further types of pesticides

DISADVANTAGES OF PESTICIDES

- Reduction of beneficial species.
- Drift of sprays and vapor.
- Residues in food.
- Ground water contamination.
- Resistance.
- Poisoning hazards.
- Other possible health effects.



HARMFUL EFFECTS OF PESTICIDE RESIDUES.

- **To Human,**
 - short-term impacts.
 - endocrine disruption.
 - Acute dangers.
 - Chronic health effects.
 - can cause many types of cancers.



HARMFUL EFFECTS OF PESTICIDE RESIDUES.

- **To the Environment,**

- Accumulate in water systems.
- Pollute the air.
- Harming beneficial insect species, soil microorganisms, and worms.
- Weakening plant root systems and immune systems.



Problems from pesticides can be diminished by following these guidelines

- Before using a pesticide, make sure that it is actually needed. Verify that pests are the root of the problem and that they are not simply covering up a deeper issue.
- Allow some pests in your yard. Some insects are actually beneficial to your yard. If a particular plant is consistently plagued by pests, replace it with a more pest-resistant one.
- A diversified yard with a variety of plants will ensure the protection of the rest of a yard, should pests attack.
- Use organic mulch or safer pest control methods whenever possible.
- Check with Cooperative Extension for additional information on pesticides and alternatives.

THANK YOU