

# Phosphorus

If there is an element that can be accused of being “short tempered” and with a “split personality” than Phosphorus is that element.

Having a “split personality” means it has two radically different “faces”, the white and the red. Furthermore, because it is also “short tempered”, in plain English highly reactive and unstable, phosphorus does not exist as a free element on Planet Earth.

Let's have a closer look at each of the two faces separately.

## **The Good Phosphorus:**

**Fact:** All known forms of life need phosphorus.

The good phosphorus is a “socialite”, a “party animal” and can be found everywhere where life exists.

Phosphates,  $\text{PO}_4^{-3}$  containing compounds, are found in DNA, RNA and ATP as well as in phospholipids, the main structural components of all cellular membranes.

Calcium Phosphate salts assist in stiffening bones, and teeth and urine contain phosphorus.

Phosphate is used by living cells to transport the energy required for every cellular process that uses energy.

Plants of course do not have bones or teeth. So, why do plants need Phosphorus for?

The answer is simple: Plants need Phosphorus to grow, flower and fruit.

Phosphorus enhances the basic processes of photosynthesis.

Assists with the nitrogen fixation.

Assists (together with Potassium) with flowering.

Assists (together with Potassium) in fruiting, seed production and maturation.

Helps with root development and growth.

Some believe that the general uptake of nutrients by plants is: 20 parts of Nitrogen: 2 parts Phosphorus: 1 part Potassium. I dispute that. I believe the need depend upon age and maturity of each plant, the seasons and weather conditions. Young plants need Nitrogen to grow, older plants need Phosphorus and Potassium to flower and seed.

It's difficult to recognize phosphorus deficiency in plants. Some people do see differences but I do not. Some claim that plants are stunted, older leaves change to darker green colour. Some claim that leaves may turn yellow or the stems and/or leafstalks turn purple. Other claims are that plants mature slowly and may not flower. I can't tell; however, there could be a connection Phosphorus deficiency and plants not flowering. **Warning: Excess phosphorus can interfere with the uptake of copper and zinc.**

## **The bad Phosphorus:**

The white phosphorus allotrope is too dangerous for my liking and presents a hazard as it ignites in air and produces phosphoric acid residue. White phosphorus poisoning leads to necrosis of the jaw and ingestion of white phosphorus may cause the medical condition known as "Smoking Stool Syndrome". Organic phosphorus compounds form a wide group of materials, some of which are extremely toxic. Fluorophosphates esters are among the most potent neurotoxins known to man.

When it comes to plants, a wide range of organophosphorus compounds are used as insecticides, fungicides etc. Some of the better known products are Dieldrin, Malathion, Parathion, Agri-Fos, Phostrol, ProPhyt, etc.

I consider Phosphorus compounds as very dangerous as it kills everything and does not discriminate. I always seek alternatives, perhaps the only one I have ever used is Malathion. Always handle Phosphorus containing products with care: Contact with skin must be avoided and wearing gloves is a must.