

Phosphorus

Phosphorus, often referred to as phosphate, is an essential plant nutrient that is needed for healthy growth – enhancing root development in particular.

Phosphorus is a non-metallic element, represented by the symbol P. It is usually referred to in gardening talks, books and fertiliser labels as phosphate – chemical formula P2O5.

Soil pH

How well plants grow can be strongly influenced by whether the soil is acid or alkaline. It's best to get the pH right before dealing with other nutrient problems.

Lack of phosphorus

It is hard to detect whether your plants are deficient in phosphorus just by looking at them. Slow and poor-quality growth, with dull blue-green leaves is typical, though this can be caused by other factors, such as drought. Phosphate deficiency is rare in gardens.

Common phosphate fertilisers

Super-phosphate and triple super-phosphate are fast-acting water-soluble fertilisers. They quickly turn into insoluble compounds in the soil, which are then slowly released again so that plants can absorb them. They are not organic.

Bonemeal and mineral phosphate or phosphatic rock are slow-acting fertilisers that take

several years to have full effect.

Their speed of action depends on how finely they are ground and on the acidity of the soil. The finer the material and the more acid the soil, the faster the effect. These fertilizers are acceptable to organic growers.

Many compound fertilisers such as growmore and fish, blood and bone contain phosphate fertilisers. These are best used to provide the nitrogen that plants need, but they contain plenty of phosphorus as well. The downside is that often the phosphorus is not needed. Not only is this a waste, but some ornamental plants can be damaged by excess phosphorus.

Manure, compost and mushroom compost contain small amounts of phosphorus.

Wood ash contains about 5 per cent phosphate and is very alkaline, having the same effect on the soil as lime. It also contains some potash and should be used very sparingly. Only wood ash is suitable for treating soil, as other kinds of ash can contain toxic materials.

Phosphorus fertilisers need to be mixed into the soil for the plant roots to be able to find the nutrients, as it is immobile in the soil. Phosphorus is not washed out by rain, but this also means that phosphate or phosphatic rock are slow-acting fertilisers that take

several years to have full effect.

Manures and composts are highly variable in composition, depending on what they are made from, how they have been stored and how well-rotted they are. Also they can vary greatly in water content. If in doubt, consider the organic matter as a soil conditioner only. Add fertiliser to provide nutrients – 70g a sq m (2oz per sq yd) of super phosphate will provide sufficient phosphate for most soils, though this may be in excess of a plant's needs.

Alternatively, use a phosphate-containing compound fertiliser such as growmore to supply a plant's nitrogen needs and this will provide plenty of phosphate as well.

Soil analysis

To find out how much phosphate your soil contains, you need a soil analysis. This should give you a 'phosphate level' from very low to very high, or a 'phosphate index' from 0 to 3. You can then use the tables to determine what to add. Alternatively, a *Which? Gardening* soil analysis will tell you the levels and recommend what action to take. Contact us for more details.

See overpage for tables giving recommended fertiliser application rates.

Water-soluble fertiiser

		Before planting or sowing add g per sq m (oz per sq yd)		Treating established plants add g per sq m (oz per sq yd)	
Soil phosphate level	Soil phosphate index	Super-phosphate (20% P2O2)	Triple super-phosphate (44% P2O2)	Super-phosphate (20% P2O2)	Triple super-phosphate (44% P2O2)
Very low	0	50 (1½)	23 (¾)	25 (¾)	11 (¼)
Low	1	38 (1)	17 (½)	13 (½)	None
Moderate	2	25 (¾)	11 (¾)	None	None
High	3	13 (½)	None	None	None
Very high	Over 3	None	None	None	None

Slow-acting fertiiser

		Before planting or sowing add g per sq m (oz per sq yd)		Treating established plants add g per sq m (oz per sq yd)	
Soil phosphate level	Soil phosphate index	Bonemeal (7% P2O2)	Rock phosphate (27% P2O2)	Bonemeal (7% P2O2)	Rock phosphate (27% P2O2)
Very low	0	143 (1¼)	37 (1)	71 (2)	19 (½)
Low	1	107 (3)	28 (1)	36 (1)	9 (¼)
Moderate	2	71 (2)	19 (½)	None	None
High	3	36 (1)	9 (¼)	None	None
Very high	Over 3	None	None	None	None

General fertiiser

		Before planting or sowing add g per sq m (oz per sq yd)		Treating established plants add g per sq m (oz per sq yd)	
Soil phosphate level	Soil phosphate index	Typical organic based general fertiliser (3% K20) plus nitrogen and potash	Growmore (7% K20) plus nitrogen and potash	Typical organic based general fertiliser	Rock phosphate (27% P2O2)
Very low	0	333 (10)	143 (4¼)	167 (5)	71 (2)
Low	1	250 (7½)	107 (3)	83 (2½)	36 (1)
Moderate	2	167 (5)	71 (2)	None	None
High	3	83 (2½)	36 (1)	None	None
Very high	Over 3	None	None	None	None

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