

Worksheet 9.5

NPK fertilisers

Plants need many substances for healthy growth and for the chemical reactions that occur within them. Most of these substances are absorbed in solution in water through the roots of the plant.

The three main essential elements that plants need are nitrogen, phosphorus and potassium. These elements may be supplied naturally by the soil, but often we need to add one or more of them in the form of fertilisers.

A fertiliser is frequently sold in a bag labelled with its name followed by three numbers which indicate, respectively, the percentages of nitrogen, phosphorus and potassium present.

For example, *BioGrow* 20–10–12 means that the fertiliser is called *BioGrow* and contains 20% nitrogen, 10% phosphorus and 12% potassium. Such fertilisers are known as NPK fertilisers. A list of some common fertilisers is given below.

Universal	15–15–15
Extra grass	29–5–5
Double season PK for fertile soils	0–20–20
Maincrop potato	10–10–15 + 4.5 Mg
Concentrated maincrop potato	15–15–19
Granphos	2–40–0
Barley for high potash clay soils	29–13–0
Winter wheat	9–23–18

1 Why are these fertilisers known as NPK fertilisers?

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2 a Name the essential element that is already present in fertile soil and so does not need adding.

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b Which essential element favours green growth (e.g. grass)?

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c Which element do potatoes need in extra high concentration?

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3 Name an element, other than nitrogen, phosphorus or potassium, which potatoes need.

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4 What percentage of nitrogen would be supplied by a fertiliser of pure ammonium nitrate, NH_4NO_3 ? (Relative atomic masses: H = 1, N = 14, O = 16.)

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5 A farmer was offered a choice of potassium nitrate or urea, $\text{CO}(\text{NH}_2)_2$, as a fertiliser. Although much more expensive per gram of nitrogen, he chose potassium nitrate.

Give **one** reason that may have influenced his choice.

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