

Pot-grown plants fall into two main categories: temporary, seasonal displays, and longer-lived, permanent plants such as camellias or clipped box. Restricted by space, their root systems cannot spread into the surrounding soil in search of nutrients, so gardeners have to supply their needs regularly to ensure they perform well.

The main nutrients for plant growth (sometimes called 'macronutrients') – N : P : K – are familiar from labels, where the rating in brackets is the percentage of the element in the feed.

❖ **Nitrogen (N)** is needed to form leaves and shoots (and can be rapidly washed from the compost by watering).

❖ **Phosphorus (P)** provides for roots and ripening fruit.

❖ **Potassium or potash (K** – the initial stands for *Kalium*, its Latin name) >>>

Garden practice

Liquid feeds

A bewildering array of liquid fertilisers is stocked by most garden centres. How many different feeds does a home gardener really need?

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encourages flowering, fruiting and hardy plant growth.

Fail to feed containerised plants and they perform badly and slowly decline; growth is stunted, leaves become small, sometimes showing symptoms of nutrient deficiencies, and flowering is poor or nonexistent (however this may also be as a result of too much nitrogen).

Plants also need a range of elements in much lower quantities, termed micronutrients, which are included in many feeds.

Liquid feed choices

Organic fertilisers are from 'natural' plant or animal sources. Others are inorganic: synthesized or naturally occurring, mined materials.

Liquid feeds are faster acting than granular fertilisers. Some are all-purpose feeds, promoting all-round performance, others enhance specific features, such as high-potash rose fertilisers formulated to encourage >>> 56



A selection of commercially



1 Doff Ericaceous Plant Feed

Formulation / origins: inorganic, ratio 6:3:7. **Usage:** apply to roots and leaves fortnightly. **Overview:** traditional general fertiliser with micronutrients for containerised camellias, rhododendrons and other ericaceous plants, including fruit. Said to promote healthy leaf and stem growth and flowering. A 1-litre bottle makes up to 300 litres (66 gallons).



4 Empathy Ericaceous

Formulation / origins: inorganic, made from seaweed extracts and micronutrients, with added sequestered iron for ericaceous plants. **Usage:** a tonic for acid-loving plants, from rhododendrons to blueberries. **Overview:** counteracts the effects of hard water on lime-haters in drought, and 'border-line' soils, preventing yellowing (chlorosis).



2 Phostrogen Tomato & Veg

Formulation / origins: inorganic, ratio 4.5:3.5:9 with added magnesium and seaweed extract, for flowering and fruiting crops. **Usage:** valuable for young, fast-growing plants. **Overview:** micronutrients from seaweed are said to stimulate growth; magnesium counteracts high levels of potash. Also use on fruiting ornamentals and on acidic soils.



5 Earth Matters Tom & Veg

Formulation / origins: macronutrient ratio 4:2:6. Organic feed from sustainable sources, said to promote growth, flowering and fruiting. **Usage:** ideal for flowering and fruiting crops such as aubergines, tomatoes and peppers. **Overview:** high-potash liquid feed that can also be used to promote flowering in a range of ornamental plants.



3 Empathy All Purpose

Formulation / origins: organic seaweed growth stimulant from sustainably harvested kelp. **Usage:** good all-round tonic for indoor or outdoor plants; can also be used at seed sowing and on fruit and lawns. **Overview:** said to encourage mycorrhizal fungi, microbes and beneficial bacteria in the soil. Trace elements promote roots and shoots.



6 Miracle-Gro Pour & Feed

Formulation / origins: inorganic fertiliser, diluted and ready to use (ratio 0.02:0.02:0.02). **Usage:** pour on the compost around the roots, according to the manufacturer's instructions. **Overview:** for containers only. Useful 'stand-by' for pots, including house plants, but costly for gardens with many containers. Apply every 7-14 days during growing season.



available liquid plant feeds (all ratios are N:P:K)



7 Doff Liquid Growmore

Formulation / origins: inorganic, ratio 7 : 7 : 7.
Usage: useful as a 'boost' for overwintered vegetables such as leeks and spring cabbage, or as a spring feed for container plants.
Overview: although the ratio implies it is a balanced fertiliser, it is 7 percent nitrogen, 3.1 percent phosphorus and 5.8 percent potassium, so is actually a high-nitrogen feed.



10 Baby Bio For Tomatoes

Formulation / origins: inorganic, ratio 6 : 5 : 9.
Usage: feed plants weekly, 10 drops per litre.
Overview: high-potash feed said to be ideal for tomatoes in pots, growing bags and glasshouse borders, and other fruiting glasshouse plants such as sweet and chilli peppers. Can also be used on ornamental, containerised flowering and fruiting plants.



8 Doff Rose Feed

Formulation / origins: inorganic, ratio 4 : 4 : 12.
Usage: feed every two weeks, according to the manufacturer's instructions.
Overview: high in potash to promote more, better-quality blooms. Good value: a 1-litre bottle makes up to 300 litres (66 gallons) of feed. Also use for container bedding or wherever prolific flowering or fruiting is wanted.



11 Maxicrop Seaweed Extract

Formulation / origins: sourced from kelp.
Usage: tonic for any plant, use 'little and often'.
Overview: said to increase populations of soil microbes, improve root systems and protect against some pathogenic soil fungi and nematodes. Also claimed to reduce cold damage and plant stress, and is particularly recommended when transplanting subjects.



9 Baby Bio For Herbs

Formulation / origins: inorganic, ratio 5 : 5 : 5.
Usage: apply every two weeks when plants are in active growth; avoid overfeeding.
Overview: said to encourage balanced growth, particularly for herbaceous herbs such as chives, mint and angelica (woody herbs are better grown 'hard'). Can also be used for woody plants in containers.



12 Vitax Tubs & Hanging Baskets

Formulation / origins: inorganic feed, ratio 4 : 2 : 6, with added copper, iron and zinc.
Usage: feed weekly in the growing season according to manufacturer's instructions.
Overview: copper and iron keep foliage healthy; zinc helps growth. Contains a wetting agent for efficient absorption; can also be used for fruiting vegetables such as tomatoes.

How plants absorb nutrients

Guy Barter, RHS Chief Horticultural Advisor



RHS/BOB MARTIN

Out of sight and, often, mind, roots are busily acquiring moisture and nutrients. To do this the soil must be moist (it will be if liquid fertilisers are used), warm and have a low pH level so nutrients are readily released from soil particles. Plants differ in their requirements, but potting media are formulated to a low pH (typically pH5.5-6.5). Some constituents of peat-free media can have a high pH, and may also have a useful nutrient content. Therefore manufacturers of peat-free potting media often have specific recommendations for liquid feeding.

Roots have a barrier to control uptake of dissolved materials, but mechanisms are built into the barrier to allow nutrients to pass. These 'recognise'

specific ions, such as ammonium and potassium. Similar ions can compete for the same mechanism - potassium and magnesium for example - and over-feeding with potassium may block magnesium uptake, leading to symptoms of magnesium deficiency.

As plants lose water from their leaves by transpiration, nutrients are carried in water flowing into the plant to replace that transpired. As the concentration falls in soil water near roots, more nutrients diffuse in, ions moving from areas of higher to lower concentration. New root growth also intercepts nutrients, but this is less important. By adding fertiliser near plants, gardeners reduce plants' dependency on diffusion of nutrients and flow of soil water, often a major factor in restricting plant growth.



Feed containerised plants in active growth for showier displays and higher yields.

54 << flowering or fertilisers for ericaceous plants.

A balanced liquid general fertiliser can be used throughout the season for shrubs and for patio plants. You can then change to a high-potash fertiliser, such as tomato feed, to promote flowering of vegetables or ornamentals. Or, use a high-nitrogen liquid feed from mid-spring to early summer, and switch to a low-nitrogen / high-potash feed from midsummer for a similar effect.

When to liquid feed

Start feeding when growth starts in spring, four to six weeks after planting in soil-less composts and

FURTHER READING

In *The Plantsman*, Sept 2013 (sister publication to *The Garden*), Geoff Dixon examines the scientific evidence of seaweed as a fertiliser. Subscribe or buy back copies via RHS Membership (see p6 for contact details).

The sheer number of fertiliser products (below) in an average garden centre can confuse.

from eight weeks when using soil-based (John Innes type) composts. Application rates and timing are displayed on the label.

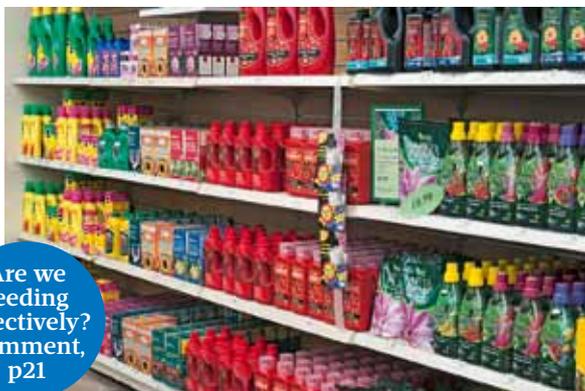
Do not overfeed: the soft growth caused by excess nitrogen is vulnerable to damage from wind, pests and diseases or frost. A surfeit of potash can lead to magnesium deficiency, and too much nitrogen inhibits flowering. Apply liquid feeds to moist compost, or, at lower dilution rates, as foliar feeds.

Feed plants according to their needs. Those providing a 'floral flourish' over a long period, such as summer 'patio' displays, need high levels of potash to sustain flowering. Long-term plantings such as herbs or shrubs need a balanced feed for steady, all-round performance. Fast-growing, leafy plants such as many vegetables need more nitrogen than those that are slower growing.

Liquid feeds are a powerful tool in the gardener's armoury, but be sure to pick the most appropriate for your particular plants. ●

How to make your own liquid feed

Comfrey, nettles and liquid from wormeries all make excellent liquid fertilisers. Comfrey is potash rich, so is useful for flowering and fruiting plants and vegetables; nettles are high in nitrogen, especially in spring, and the liquor from a wormery is a good general feed. Add about 1kg (2 lb) nettles to 10 litres (2 gal) of water, leave for about two weeks and use at a dilution rate of 10 : 1. Add 1kg comfrey leaves to 15 litres (3 gal) of water and leave for six weeks in a sealed container then use undiluted. Wormery liquid should be diluted with water until it is the colour of weak tea, usually at a rate of 10 : 1.



Are we feeding effectively? Comment, p21

More from the RHS Search 'Fertilisers', 'Watering and feeding' and 'Seaweed products' at www.rhs.org.uk