



# *Garden practice* SOWING without peat



By adding vermiculite, perlite or grit to peat-free growing media, RHS Garden Wisley improved the success of seed germination and rooting of cuttings

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*In the commercial* horticultural world, a growing medium (usually known as 'potting compost' in garden centres and nurseries) is formulated to meet specific plant requirements. Manufacturers blend ingredients to produce media intended for propagation, for growing on and for myriad niche applications.

By contrast, most peat-free composts sold to gardeners are described as 'multipurpose'. Manufacturers recommend these for a wide range of use from seed sowing to repotting of mature plants.

At the moment, the most readily available multipurpose peat-free composts are formulated to contain varying amounts of composted green waste, conifer bark, wood waste or coir fibre. Manufacturers blend one or more of these products to create a workable, open yet moisture-retentive growing medium, adding a fertiliser mix suitable for the type of bulk ingredients used.

### Peat-free in use

Unlike peat-based products, peat-free multipurpose growing media are often variable in appearance and need different handling. Where the main constituent is a blend of composted bark and wood waste the growing medium may appear to be loose and open; high levels of green waste, on the other hand, make a compost dense and heavy; coir is most peat-like but can appear dusty and without substance.

This variability is a real problem in propagation, which requires a seed bed for sowing fine seeds or an open compost for rooting cuttings. Home gardeners, however, can easily manipulate a 'multipurpose' compost by using different additives to improve the texture and so give more consistent results.

To demonstrate this, our team at RHS Garden Wisley grew begonia and lettuce seedlings and rooted fuchsia cuttings in a range of peat-free multipurpose composts. We sieved some composts first and then added perlite, vermiculite or grit (see box, p46) in varying ratios, depending on the initial texture, to make them all more versatile (and more suitable for containers, including smaller modules) at modest extra cost. ●

Fine seedlings of *Begonia semperflorens* need an even-textured peat-free compost to germinate well.



**Nick Morgan:**  
'When seed sowing, it seems that coir is a good peat-free medium to use, but adding vermiculite gives a more even germination. For rooting cuttings, it is – on balance – better to add perlite to coir or green waste-based media, rather than grit.'

## Adjusting texture

Multipurpose growing media vary in texture due to the nature of the main ingredients and the mix in particle sizes. Some initial preparation can make the product more uniform, suitable for fine seed germination and propagation by cuttings.



**1 In the bag:** Growing media can become quite compressed during transportation and storage, so tip it out to break it down. If dry, it should be thoroughly wetted and left to rehydrate for some time before use.



**2 Break down lumps:** After it is fully hydrated, rub the growing media between hands to break up lumps and ensure a uniform and aerated product ready for tray and pot filling.



**3 Sieve:** Pass through a medium (about 6mm / ¼in) mesh to remove large particles that can create voids. These can reduce surface contact and moisture uptake in finer seeds and inhibit root growth in cuttings.



**4 Mix in additives:** Add vermiculite, perlite or grit to replace the volume of coarse material removed by sieving or aim to add about 15 percent. This maintains or improves drainage and moisture retention.

## Peat-free propagation

## Sowing seed with peat-free growing media

Vermiculite is the most useful additive for mixing in at different proportions. It improves aeration and drainage in any multipurpose peat-free compost and helps achieve the desired texture for sowing. In the Wisley test, seed germination (*Begonia semperflorens*, below) was successful in all three types of peat-free composts but the rate of growth varied.



### Coir + vermiculite

**Overview:** Coir is a user-friendly material derived from coconut husks and now widely available as a growing medium or an ingredient in other mixes. We broke down blocks of compressed coir-based compost by immersing them in a bucket of water.

**Treatment:** Coir does not require sieving as the particles are small enough. We added one part medium-grade vermiculite to eight parts compost by volume, to improve aeration and help regulate the nutrient availability in the mix that would benefit seedlings.

**Germination results:** Both fine seed of begonia and larger lettuce seed germinated evenly. At pricking-out, the root systems were well developed and manageable. Particles of compost remained attached to the roots, which would aid a quick establishment into their new growing medium.



### Green waste + vermiculite

**Overview:** Composted green waste is used in varying amounts in many peat-free growing media. Particle sizes vary from dust-like to angular pieces several millimetres across.

**Treatment:** We used a 6mm (¼in) sieve to remove larger particles, and added medium-grade vermiculite to the compost at a ratio of 1:4 by volume. The mix was lighter, flowed easily between the fingers and water drained through quickly when containers were wetted-up prior to sowing. Green waste-based composts can be nutrient rich, which may be detrimental to germinating seeds; vermiculite helps to buffer the compost by holding on to some plant nutrients.

**Germination results:** Medium and fine seed germinated excellently and transferred to new compost with ease.



### Wood fibre + vermiculite

**Overview:** Wood-based growing media may include stripped bark, pulverised wood, sawdust or even paper waste. There are identifiable pieces of wood and bark in the mix, making it lightweight and free draining.

**Treatment:** We removed a high proportion of the larger particles with a 6mm (¼in) sieve and mixed in one part medium-grade vermiculite to four parts compost to help retain moisture. The final seed bed was acceptable even though fine slivers of wood were visible.

**Germination results:** Fine and medium seed germinated freely but development was slower. This may be attributed to a lack of nitrogen, possibly depleted as the wood products continue to decay. Applying a dilute liquid fertiliser after germination may have helped. >>>

## Adapting peat-free for cuttings

An ideal rooting medium for cuttings (here *Fuchsia*) needs to be open and free draining, to balance air and moisture supplies for developing roots – different ratios of perlite (or grit) can be used to achieve this. From this demonstration, it appears removing large particles and adding perlite helps.



**Coir + grit**

Coir can appear dry on the surface when still wet lower down; we added 3mm (1/8in) grit at a ratio of 1:8 by volume to improve drainage.

**Result:** All the cuttings had produced roots within 18 days.



**Coir + perlite**

We added one part medium-grade perlite to 10 parts compost by volume.

**Result:** Cuttings had produced roots within 18 days, with more extensive root systems than those raised in the coir and grit mix.



**Green waste + grit**

We passed the growing medium through a 6mm (1/4in) sieve, then added one part 3mm (1/8in) grit to eight parts compost by volume.

**Result:** In 18 days, the cuttings had developed a robust, expanding root system.



**Green waste + perlite**

After sieving the green waste-based compost, we added medium-grade perlite at 1:8 parts by volume.

**Result:** Root growth after 18 days was similar but top growth was more developed.



**Wood fibre + grit**

We adjusted the open texture by sieving to remove coarser particles, then replaced with 3mm (1/8in) grit at 1:8 parts by volume.

**Result:** After 18 days rooting was adequate but roots appeared quite fine and fragile.



**Wood fibre + perlite**

Once the compost had been through a 6mm (1/4in) sieve, we added perlite at a ratio of 1:10 to improve the moisture and air balance.

**Results:** Rooting was similar to that in the wood fibre and grit mix after 18 days.



## Vermiculite, perlite or grit: which to choose?

**Vermiculite** is a naturally occurring mica mineral that is mined, heated and crushed to create multi-laminated particles, a high-energy process. It is often added to growing media for seed sowing because it maintains air spaces to assist drainage. The laminated particles create a large surface area on which moisture can be trapped, and it helps retain nutrients.

Available in coarse, medium and fine grades, vermiculite is valuable as a covering after sowing: it insulates the seeds, keeps them in contact with the moist compost and does not impede emergence.

**Perlite** is derived from igneous rock which is mined, then heated to extreme temperatures, requiring a high-energy input. As trapped moisture is driven out it expands to many times its original volume, creating a lightweight product which is then processed into granular particles in various sizes. Perlite does not have the moisture- and nutrient-holding capacity of vermiculite; it is added to growing media to improve drainage and aeration.

**Horticultural grit** derives from aggregate (such as granite), which is washed and lime free (so does not raise the compost pH). It improves drainage and adds weight to the compost. Useful sizes for adding to growing media range from 3–6mm (1/8–1/4in); they often have a proportion of smaller particles in the mix.

**More from the RHS** For more comparisons of seeds sown in different composts, see *The Garden*, Jan 2011, pp51–56; read the feature online via 'Issues' at [www.rhs.org.uk/thegarden](http://www.rhs.org.uk/thegarden)