

Propagating Dahlias for Royal Horticultural Society Trials®

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INTRODUCTION

The dahlia is a member of the Asteraceae and comprises 30 species of perennial herbs and sub-shrubs. It is found growing in the wild from the mountains of Mexico to Columbia. The genus was introduced into European cultivation in 1789 at the Royal Botanic Gardens in Madrid, from where it was distributed across Europe, reaching the U.K. (Royal Botanic Gardens, Kew) in 1798.

Dahlia coccinea and *D. pinnata* are the origin of the vast majority of garden hybrids. Dahlias hybridise readily and today there are more than 50,000 registered cultivars.

Each year the dahlia trial at RHS Garden, Wisley, produces an unrivalled display from late summer until the November frosts. Wisley's propagators produce three 13-cm pots each of 120 to 150 entries trialled each year. The trial includes a selection of the best new cultivars and a selection of old standards with which the new ones can be compared.

DEVELOPMENT OF PROPAGATION TECHNIQUES

Propagation methods for the trial have evolved over the past 20 years. Apart from the few occasions when the trials committee requires seed-raised stock, the entries that are assessed for the RHS Award of Garden Merit are raised vegetatively.

For many years the trial was propagated using cuttings from shoots produced by field tubers. This enabled the committees to identify the particular plant that would be lifted from the trials field, for use as stock for the following year. Because the dahlia continually throws up sports, changes its appearance slightly, or succumbs to virus, it was felt that selecting field-grown tubers for propagation material produced plants that the committee could most confidently say were true to type.

Field Tubers as Stock Plants. Once the first frosts of late autumn have blackened the tops of the still-flowering dahlia, the vegetative growth is cut back to within 15 cm of ground level. The tubers are lifted and stored frost-free before cleaning. A field-grown tuber stores food to ensure its survival over winter, but also contains large volumes of water, which, if left, rots the tuber.

Most of the soil around the tuber is washed off. Any damaged tubers and fine roots are removed with secateurs and then dried out prior to placing in soilless substrate in trays or boxes.

Large tubers may need further draining and this can be achieved by sawing off the remaining vegetative growth down to the neck of the tuber. This is where many resting vegetative buds have formed during the growing season. A power tool is used to drill through the centre of the tuber from the neck to the base. This allows excess water to drain through the hole. The tuber is left to dry for a further couple of days and then placed in soilless compost as above. The tuber is covered leaving the neck exposed and over-winter frost-free.

This time-consuming and costly process remained the main source of propagation material for the trial for many years. However, 10 years ago we began to use pot

tubers. These produce more reliable stock plants, which are less prone to rotting during the winter months and less time consuming to store and which produce many more, better quality, cuttings compared to the fleshy cuttings thrown up from a field tuber.

Pot Tubers as Stock Plants. Pot tubers, as the name suggests, are grown in containers. From a young cutting struck in spring the plant is managed in a container. This restricts the roots and tuber growth while encouraging vegetative growth. Good growth in autumn will ensure good quality tubers as the plant is laying down its food reserves. This leads to a tuber with more carbohydrate reserves compared with a fleshy, nitrogen-rich, field tuber. A field tuber can be 20 times bigger than one of the same cultivar grown in a 13-cm pot.

With this technique shoots begin to grow rapidly when the pot is moved in spring into a warm glasshouse (18 °C) and watered. Crops of thin nodal tip cuttings can be harvested within a fortnight.

Pot tubers are easier to over-winter and usually produce excellent cutting material but still require a large labour input to produce a high quality product. Each year the RHS propagation team grew and then “planted out” between 600 and 1000 pot tubers in prepared beds in June. Seep irrigation was installed, but the beds had to be kept free of weeds, pests, and diseases. Once poor performers and those not true to type were removed, the plants were constantly deadheaded to ensure that maximum energy went into the tuber. In autumn, after the first frosts, the plants were cut back and the pots lifted and cleaned before storing dry over winter on Danish trolleys in a frost-free environment. In spring the tubers were knocked out and repotted into fresh substrate before going into the warm greenhouse.

To help us reduce the labour input while maintaining quality of propagation material we have in the last 2 years begun to take cuttings from mother plants that we keep growing throughout the winter.

Propagating From Over-Wintered Mother Plants. To propagate mother plants we select the best stock from the trials field in the beginning of September and cut back a couple of the flowering stems. Within 2 weeks, fresh vegetative growth will have developed and at this point we take and strike our cuttings. We avoid hollow growths or shoots ending in flower buds. These are very common at this time of year as dahlia flower bud initiation takes place in short days. To reduce the risk of virus transfer, we sterilise knives and secateurs with Virkon between cultivars.

At the propagation bench we prepare 4- to 6-cm cuttings by removing one or two lower leaves, where possible cutting below a node while retaining the tip. Once again we sterilise blades between cultivars. Most dahlias root easily in spring but are slightly more reluctant in September. We apply a 5-sec quick dip of rooting hormone (Synergol at 1000 ppm) to the base of the cutting and insert into plug trays. We currently prefer the preformed 104 Jiffy glue plug.

Dahlias require high humidity to root so we place them on a mist bench and provide a minimum of 20°C bottom heat. Most cultivars root within 3 weeks. If rooting is slow we have tried using Rhizoapon tablets, which we then dissolve and apply as a spray over the foliage of the rooting cuttings. This appears to top up the rooting hormone levels at this time of year and has increased our success rates.

The rooted cuttings are then weaned and potted off into a 9-cm container, using a general purpose potting compost suitable for bedding and houseplant production.

The pots are placed on a heated bench (15 °C) and provided with an 18-h day (high-pressure sodium lamps). Without the lamps at this time of year, any growth would be poor and probably run to flower bud. With the additional lighting the young mother plants continue growing throughout the winter and require cutting back on two or three occasions. From mid-March we turn off the lights.

Plants for the trial are propagated from cuttings taken from these over-wintered mother plants towards the end of March. These are struck and rooted as described above. The rooted cuttings are potted off into 13-cm containers, grown on under glass, and hardened off outside in mid-May ahead of planting in the trials field in June.

The young plants grow rapidly in spring and require the addition of a cane and a single Max Tapener tie. Dahlias are prone to attack from aphid and spider mite, both of which can be treated with biological controls such as *Aphidius colemanii* for aphid and *Phytoseiulus persimilis* for spider mite. We also apply a regular spray of SB Plant Invigorator, which has reduced the need to use both biological agents and conventional pesticides.

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