

HEATH AND HEATHER PROPAGATION

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Heaths (*Erica*) and heathers (*Calluna*) are members of the Ericaceae family, which contains about 70 genera with approximately 1500 species distributed through both hemispheres. *Erica* is one of the largest genera, with some 500 species that are found chiefly in South Africa, also in the Mediterranean region, as well as Central and Northern Europe. The South African species are not hardy in northern climates, but several are useful ornamentals in the U.S. Southwest as well as for the cut-flower trade. The Mediterranean species are cold hardy to +10°F (+5°F with winter protection). It is the group from the less temperate regions of Europe that we are chiefly concerned with, species with cold hardiness ratings that range from -5 to -35°F (*E. carnea*, *E. cinerea*, *E. × darleyensis*, *E. tetralix*, *E. vagans* and *E. × williamsii*). There are other genera that are called heaths that can be grown in northern climates; they are the spike heath (*Bruckenthalia*), the Irish heath (*Daboecia*) and the mountain heaths (*Phyllodoce* spp.), as well as members of the allied genus *Cassiope*. Heather (*Calluna*) contains but one species, that being *C. vulgaris*; its distribution is from Europe to Asia Minor. Luckily, heathers produce sports from which over a hundred named cultivars have been selected. Heathers are cold hardy to about -20°F but some cultivars with yellow foliage will not tolerate hot humid conditions without light shade; as a result there are very few yellow-leaved cultivars that are worth commercial production in the U.S. Northeast. In the U.S. Northwest and Europe this is not a problem.

Heaths and heathers sold in the Northeast are low growing evergreen shrubs that range in heights from 3 in. to 3 ft, when grown in the milder areas of our region. They are not widely used in landscape situations because they require winter protection. They are worth the trouble though, for few other plants give so much color for so long a period of time. Collectively, their flowering season spreads throughout the whole year and there are forms with foliage of red, orange, yellow, gray, bronze and rich greens that provide a continuous display. Only dwarf conifers come close to providing such a show and they do not produce the showy display of bloom. The two groups are often planted in combination, for dwarf conifers provide interesting contrast in texture and height.

PROPAGATION

The IPPS Proceedings contain three articles on this subject (see "Additional Reading" below). In the interest of brevity I will not

compare techniques, but just discuss how White Flower Farm propagates heaths and heathers.

Source of cutting material. 1) *Stock plants.* We have recently established a stock block for heaths and heathers. These plants are grown on a west facing slope and the area was treated with Round-Up before planting to eliminate perennial weeds. Generous quantities of peatmoss were added to the soil before planting to provide the abundant moisture that they need and also to lower the pH of the soil to between 5.0 and 5.5. They are mulched with 2 to 3 in. of pine needles that we buy from South Carolina. During the winter we will lay pine boughs over the plants and put up snow fence to trap snow and protect them from wind desiccation. We expect lows of -20°F every second or third winter and if this happens with no snow cover and high winds the evergreen foliage of heaths and heathers is freeze-dried with devastating results.

2) *Saleable plants.* Judicious pruning of the saleable plants that is necessary in the late summer also provides cuttings at propagation time. Some cultivars are slow growing and do not provide us with the quantity of cutting material we need, hence the need for a stock block.

3) *Display border.* This is located close to our retail outlet and we use these plants as a last resort so as not to spoil the display.

Propagation timing. We have found it necessary to propagate *Erica vagans* cultivars when they are in soft growth in June and July. Other *Erica* species and cultivars, as well as *Bruckenthalia*, *Calluna* and *Daboecia*, are propagated in early to mid-September. We occasionally have to root make-up cuttings as late as November; they root satisfactorily but propagation at this time of year does not fit our production cycle as well. Late propagation also necessitates the use of much warmer greenhouse temperatures for growing on the rooted cuttings: 60°F instead of our usual 40°F .

Propagation environments. 1) For heathers (*Calluna*) we use unheated outdoor frames that are 6 × 60 ft and covered with clear polyethylene, supported by a pipe-frame structure. These frames are oriented east-west and the south side has doors for access and ventilation. There is no bottom heat and mist is provided by 180° nozzles that spray from one side of the frame. The frequency is controlled by a timer with a 6 min frequency setting and with multiple 6 sec duration tabs. At first a double 6 sec burst is used every 3 min; after a week or so this is reduced to single bursts, then one burst every 6 min, and after 3 or 4 weeks the mist is turned off.

2) For heaths (*Bruckenthalia*, *Daboecia* and *Erica*) we have found it necessary to root these in a glasshouse with mist and 70°F bottom heat. Last year we built two propagation chambers within our Lord and Burnham glasshouse. These are approximately 24 ft sq with independent heating and ventilation. They were walled off with double-walled polycarbonate panels to provide environments

that could be controlled accurately. We use them for a wide assortment of perennials and shrubs, including the heaths. All cuttings are stuck in flats or multipots to allow us the flexibility of removing them as soon as they are rooted, permitting multiple-use of this area.

Rooting containers. We have always used wooden flats that measure 22 × 11 × 3 in., but recently we started to use rigid plastic flats. These work just as well, will be easier to pasteurize, and will last much longer.

Rooting compost. For both heaths and heathers we use equal parts of peat moss and coarse perlite. We have found it better to mix this by hand as our soil-mixing machine pulverizes the compost too much and thus reduces the air content drastically, especially after several weeks under mist. As we fill the flats for heathers we first put down a 1-inch layer of compost then sprinkle 1 tablespoon Osmocote 18-6-12 slow release fertilizer to provide nutrients for the cuttings as soon as they are rooted; the flats are then filled to the top. The fertilizer in Osmocote is released before heaths have rooted and, in our experience, this inhibits rooting; therefore, for heaths we sprinkle 1-tablespoon Osmocote 18-6-12 on the surface of the compost after rooting.

Rooting aid. We use Hormo-Root B for all our heaths and heathers. This contains 15% Thiram and 0.4% IBA in talc.

Harvesting and preparation of cuttings. We take a day's supply of cuttings early in the morning and place them in plastic bags in a refrigerator until they are needed. Depending on the vigor of the cultivar, cuttings are taken from 1 to 3 in. long, branched shoots preferably. Foliage is stripped off the lower half-inch, the cuttings are dipped in Hormo-Root B, and stuck 80 to a flat. We use an 80-nail marking board to space the cuttings evenly. Cuttings are watered in gently and placed under mist.

After rooting treatment. The flats of rooted cuttings are moved to a polyhouse which is kept at a nighttime temperature of 50°F for the first two months and then dropped to 40°F for the remainder of the winter. Daytime temperatures are 10°F higher. Vigorous cultivars are sheared to promote branching. As the days get longer in late winter the young plants are fed every two weeks with 20-20-20 liquid fertilizer used at half strength for the first 4 applications then given two full strength feedings just before potting in April. During the winter the only problems that appear are the occasional weed, which we pull by hand, and liverworts, which are controlled with drenches of Thiram at 4-teaspoons per gal of water.

Potting the rooted cuttings. We use two sizes of plastic pots, a 2 qt square pot and a deep 3 pt square pot for the less vigorous cultivars. Our potting compost is mixed by a soil-mixing machine and consists of:

9 bags of aged pine bark [27 ft³]

2 bales of peat moss [15 ft³, loosened]
2 bags of coarse perlite [12 ft³]
10 lb agricultural gypsum
10 lbs dolomitic limestone
3 lb Micromax trace-element mix
3 lb superphosphate [0-20-0]
4 lb potassium nitrate [13-0-44]

We use a knife to separate the young plants before potting them on a Bouldin and Lawson potting machine. The freshly potted plants are placed in rigid plastic trays and placed in a polyhouse. The trays were obtained from Holland with our lily bulb shipments. By the middle to end of May we remove the polyethylene and replace it with 40% polypropylene shade cloth which we leave on for the first month.

Summer treatment. This consists of watering overhead and occasional spot watering by hand; feeding—injected into the overhead water using 20-20-20; weeding—mostly bittercress and dandelions which are removed by hand; spraying for what we call summer botrytis (*Pestalotiopsis* sp.) with a combination of Benlate (benomyl) and Manzate at ½ tablespoon and 1½ tablespoon per gal of water, plus a spreader/sticker; shearing—this is done by hand on the vigorous types only and early flowering heaths are not sheared after July 1st to avoid cutting off next year's flower buds.

Winter treatment. The root killing temperature of container grown heaths and heathers is about 15°F and so we set the heat at 20°F. To make sure that they are completely dormant, this crop is the last to be covered with polyethylene. All our polyhouses are double-skinned and air-inflated. For the heaths and heathers we use white copolymer polyethylene over a layer of clear plastic to reduce temperature fluctuations. We once tried barrels of water painted black to hold residual heat; instead they froze in the early part of the winter and remained solid blocks of ice till spring. High humidity on sunny days is removed by opening the doors at both ends of the house; if available, forced air ventilation would be better. We have a preventative spray program of Benlate and Zyban during the winter to reduce Botrytis infestations. Watering is not needed very often during the winter months and is usually done by hand when necessary.

Shipping. Shipping is done in early fall only to locations south of Litchfield, CT. Fall planting is not recommended to areas where the winter temperatures go below -20°F. None are shipped after October 15th. In spring we ship to southern states starting in late March and finish all shipping by June 1st.

ADDITIONAL READING

Cross, J. E. 1972. Propagation is just the beginning. *Proc. Inter. Plant Prop. Soc.* 22:345-349.

- Cross, J. E. 1976. *Calluna* and *Erica* production and distribution. *Proc. Inter. Plant Prop. Soc.* 26:228–232.
- Kelly, J. C. and Bowbrick, P. 1973. The rapid production of ericas, callunas, and daboecias. *Proc. Inter. Plant Prop. Soc.* 23:121–129.

PRE-EMERGENT HERBICIDE EFFECT ON THE ROOTING OF CUTTINGS

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Abstract. Unrooted cuttings of *Rhododendron obtusum* 'Hino Crimson', *Euonymus fortunei* 'Emerald Gaiety', *Ilex crenata* 'Helleri', and *Cotoneaster horizontalis* were treated with Dual, Devrinol, Ronstar, Surflan, and Rout. Cuttings were then allowed to root under intermittent mist in a polyethylene greenhouse, and were later evaluated for rooting percentage and rooting quality. When compared to the untreated check, results indicated no significant difference with the use of Ronstar as a pre-rooting herbicide treatment for *R. obtusum* 'Hino Crimson', *E. fortunei*, and *I. crenata*. Likewise, Rout showed similar results for *R. obtusum* 'Hino Crimson' and *E. fortunei* 'Emerald Gaiety'. All other herbicide treatments demonstrated poorer results of either percentage or quality of rooting on the species tested.

REVIEW OF LITERATURE

In southern New Jersey, many growers of woody nursery stock root their cuttings in outdoor beds or in open greenhouses. Each year, from grower experience, weed seeds apparently are blown onto the rooting medium and cause subsequent expenses in hand weeding. The weed growth also results in reduced growth of the cuttings through competition and/or mechanical disruption during the weeding process. A previous study indicated some potential for using several pre-emergent herbicides during the rooting phase of cuttings. This study was initiated to further determine the potential for using pre-emergent herbicides as weed control agents on unrooted cuttings, while examining their effect on rooting ability and quality of rooting.

MATERIALS AND METHODS

Cuttings from four species; *Rhododendron obtusum* 'Hino Crimson' (Hino Crimson azalea), *Euonymus fortunei* 'Emerald Gaiety', *Ilex crenata* 'Helleri', and *Cotoneaster horizontalis* were taken on July 24, 1986. A quick-dip hormone (Dip 'n' Grow diluted 10:1 for *Ilex* and 20:1 for all other species) was used on the cuttings which were stuck in 3 × 3 × 3.5 in., #18 cell trays. The medium was a mix of peat:vermiculite:perlite:sand (70:10:10:10, v/v/v/v), and