

A large, dense bush of white-flowered Fothergilla x intermedia is the central focus of the image. The flowers are small and numerous, creating a soft, white cloud effect. The leaves are green and glossy. In the background, a white metal garden table and chairs are visible, and a large tree with peeling bark stands behind the bush. The overall scene is a lush garden setting.

The hybrid *Fothergilla x intermedia* in a US garden. Despite the age of this plant, it is more compact than *F. major* which can grow to 6m in height

Fothergilla in cultivation

It is not only the blue-leaved cultivars of witch-alder that have caught the attention of gardeners recently; a long-suspected hybrid has also been confirmed. RICK DARKE outlines the species and cultivars

WHY, SINCE *Fothergilla* has been in cultivation in the UK and USA for over two centuries, has it achieved real popularity only in the last two decades? A number of factors have contributed to this phenomenon, and due to recent research and development, we are now ideally positioned to reflect upon the natural history and horticultural evolution of this first-rate genus of flowering shrubs.

History in cultivation

Fothergilla belongs to the witch hazel family, *Hamamelidaceae*, and includes



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only two species, *F. gardenii* and *F. major*, both native to southeastern North America. Although the common name witch-alder is most often encountered in literature, it is rarely spoken: *Fothergilla* serves equally well as botanical and common name.

The genus name honours Dr John Fothergill (1712–1780), an English Quaker physician whose 18th-century Essex garden garden included one of the earliest, most extensive collections of North American indigenous plants. Fothergill was the patron of William Bartram's botanical explorations of southeastern North

America and he corresponded with other early botanists exploring the New World flora, including Dr Alexander Garden (1730–1791). Garden, a Scottish physician and zoologist, settled in Charleston, South Carolina in 1752 and for more than twenty years devoted his spare time to collecting regional flora and fauna, corresponding with and sending specimens to John Ellis in London and Linnaeus in Sweden. Garden is responsible for first discovering *Fothergilla*, collecting and describing the species we now know as *F. gardenii*, and introducing it to England by 1765. The discovery and introduction of *F. major* is more obscure; however, it was in cultivation in England by the 1780s.

Following a brief period of popularity around the time of their introduction, both species were sparingly cultivated through the 19th century and for most of the 20th, though prominent horticulturists periodically attempted to draw attention to *Fothergilla*. Charles Sargent began promoting *F. gardenii* in *Garden and Forest* in 1895, noting that it had proved cold-hardy at the Arnold Arboretum and suggesting 'few shrubs present a more curious and beautiful effect than *Fothergilla* when it is covered in flowers. Its habit is excellent, too, and its foliage is abundant and rich in color' (Sargent 1895). Richard Weaver profiled the fothergillas in *Arnoldia* in 1971, noting that they remained undeservedly little known and that there were not yet any named horticultural varieties of either species (Weaver 1971). Michael Dirr and Harrison Flint promoted *Fothergilla* in numerous books and articles in the 1970s and early 1980s, but despite such efforts, *Fothergilla* generally remained obscure curiosities, generally unappreciated, unavailable, and under-utilised. It

would take the inadvertent hybridisation of the two species, nearly two centuries after their discovery, to propel *Fothergilla* toward real celebrity.

Two distinct species

Understanding modern fothergillas begins with a fresh look at the species' natural histories, cultural requirements and horticultural traits. Though thoroughly confused in recent garden literature, *F. gardenii* and *F. major* could hardly be more distinct. The two species vary dramatically in the size of their physical characters and there is no overlap in their natural ranges.

Fothergilla gardenii

Often known as dwarf fothergilla but perhaps best called coastal fothergilla, *F. gardenii* is restricted to the coastal plain of North Carolina, South Carolina, Georgia, Alabama, and the Florida panhandle (Sorrie *et al.* 2006, Weakley 2006).

Uncommon or rare over most of its range, this species is found in transitional zones from wet pine savannas to moist shrub-bogs properly called pocosins. Pocosins typically occupy poorly drained ground and are fed by groundwater seeps. Pocosin soils tend to be deep, sandy, peaty, acidic and nutrient deficient. The soils are usually saturated although they are subject to brief dry spells when extended droughts lower water tables. Fire is an essential element in pocosin ecosystems and is important in maintaining the relatively open, sunny conditions preferred by shrubs such as *F. gardenii*, which is tolerant of burning as long as its roots are perennially moist.

Although community mixes vary with moisture, shade and fire frequency, woody species often growing in association with *F. gardenii* include *Pinus serotina*, *Magnolia virginiana*, ►



Reel Danks

Acer rubrum, *Chamaecyparis thyoides*,
Persea palustris, *Smilax laurifolia*,
Kalmia cuneata, *Myrica cerifera*,
Gaylussacia frondosa, *Lyonia ligustrina*,
Ilex glabra, *Cyrilla racemiflora*, *Clethra*
alnifolia, *Viburnum nudum*, *Aronia*
arbutifolia and *Amelanchier obovatis*.

Fothergilla gardenii is low-growing, typically attaining only 60–90cm in height and often suckering to equal or greater spread. The pubescent, green to blue-green leaves are relatively small, ranging in length from 2 to 6cm and in width from 1.5 to 5cm. The leaf bases are always symmetric and the margins are entire in the lower portion and toothed in the upper. Flowering occurs in early spring before the leaves unfold. In native habitat this is typically early to mid April. Highly conspicuous on still-naked branches, the 2 to 3cm tall inflorescences consist of dense terminal spikes of minute flowers. Fothergillas are monoecious, with male and female flowers occurring separately within the spikes. Petals are entirely lacking and even the sepals are greatly



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Fothergilla gardenii 'Blue Mist' (top) was one of the earliest blue-leaved cultivars to be selected but it is not particularly vigorous. It exhibits the low-growing habit of the typical species (in flower, above)

reduced. Only the male flowers have showy parts, and these are the bright ivory-white filaments of the stamens, each of which is topped by tiny

yellow anthers. The inflorescences are strongly and delightfully fragrant, with a honey-like scent that carries far on spring breezes. Autumn colour



Richard Bloom

F. gardenii 'Blue Mist' is one of the earliest named cultivars and one of the few that has always correctly been identified as *F. gardenii*. Introduced by the Morris Arboretum in Philadelphia, it remains distinctive for its glaucous blue summer foliage. The colour is not nearly as strong as *F. x intermedia* 'Blue Shadow' but it is still quite pleasing. Compact, to 80cm tall, it has low vigour and no appreciable autumn colour, but can be a valuable landscape shrub in optimum cultural conditions.

F. gardenii 'Harold Epstein' is truly diminutive. Compact and barely 40cm tall with green summer foliage, it has better vigour and autumn colour than 'Jane Platt' in warmer climates. It was named for celebrated rock gardener Harold Epstein and popularised by the Arnold Arboretum.

F. gardenii 'Jane Platt' is another older cultivar that has always been correctly identified as *F. gardenii*. Green-leaved and compact, to 60cm tall with lax stems, it is durable and vigorous with good autumn colour in the Pacific Northwest but much less so in warmer climates. It originated in the Portland, Oregon, garden of Jane and John Platt.

Fothergilla major

Called mountain or large fothergilla, *F. major*, is a highland species typically occurring at elevations of 500m and above, primarily in the mountains of North Carolina, South Carolina, Tennessee, Georgia and Alabama, with disjunct populations in Arkansas and limited occurrence in the North Carolina Piedmont foot hills (Weakley 2006). It is uncommon but often locally abundant, spreading by suckers to form large masses.

Its mountain habitats range from mature but somewhat open mesic forests to, most commonly, ➤

Some selections of *Fothergilla gardenii* show autumn colour but this species rarely exceeds 90cm in height

varies among seedlings and with environmental conditions, from unremarkable yellow-green to vibrant yellow, apricot, burgundy and crimson.

In cultivation, *F. gardenii* has proved the less adaptable of the two species though it can be a fine performer if provided proper conditions. Though usually cold-hardy to USDA zone 5, it is much more subject to winter damage than *F. major*. It absolutely requires acidic, well-drained but continually moist soil for vigorous growth and longevity. It is a consistently poor performer in heavy, alkaline soils subject to drought. It thrives in the climates of North America's Pacific Northwest and northern Europe if provided acidic

conditions. In warmer, drier regions it does better when sited in part shade, though flowering is always most profuse in sun.

Fothergilla gardenii is the more prolific seeder, producing many woody capsules typically with two fertile seeds each. It can be propagated by seed or by softwood cuttings.

Cultivars of *F. gardenii*

F. gardenii 'Appalachia' is vigorous yet compact, to 60cm tall with strong orange-red autumn colour.

F. gardenii 'Bill's True Dwarf' is among the larger selections of this species, growing to 1m tall, with blue-green summer foliage and good autumn colour.

exposed ridges with thin, rocky, acidic soils and a relatively high incidence of fires. In such sites plants are often exposed to prolonged dry conditions in summer, though these are mitigated by typically cool night temperatures. At lower Piedmont elevations it prefers cliff-like, cooler north-facing slopes. Woody species occurring with *F. major* in mountain habitats include *Pinus pungens*, *P. virginiana*, *Quercus coccinea*, *Q. prinus*, *Acer rubrum*, *Liriodendron tulipifera*, *Oxydendrum arboreum*, *Halesia tetraptera*, *Magnolia acuminata*, *Magnolia fraseri*, *Nyssa sylvatica*, *Kalmia latifolia* and *Hamamelis virginiana*, which in its vegetative state is easily mistaken for *Fothergilla* due to its remarkably similar foliage.

Fothergilla major is a large, multi-stemmed shrub capable of exceeding 6m in height. The leaves are also large – usually up to 13 cm long and 6 to 11cm wide – and the leaf bases are strongly asymmetric. The foliage is typically green and less pubescent than that of *F. gardenii*.

Plants with fully glabrous leaves have in the past been segregated as *F. monticola*, however this name is no longer recognised in the US, either for wild or cultivated plants and all such material is included in *F. major*. The name persists in the UK, as Monticola Group, but the variation seen may be just clonal rather than representing a consistent taxon (Bean 1988).

In its native habitat, *F. major* flowers later than *F. gardenii*, typically towards the end of April, primarily due to cooler conditions at high elevations. When in cultivation together the two species bloom nearly simultaneously.

The inflorescences are much like those of *F. gardenii* but are significantly larger, with spikes up to 5cm tall. Autumn colour is variable but is reli-



Rich Clarke

Providing reliable autumn colour, *Fothergilla x intermedia* 'Mount Airy' is easy to propagate by cuttings

ably vivid, ranging from clear yellow through apricot and orange to crimson and dark burgundy. Individual shrubs often exhibit all these colours over a few sunny autumn weeks.

Fothergilla major is tolerant of a wider, often more stressful range of conditions in its native habitats than *F. gardenii* and this translates into much greater adaptability in cultivation. It has greater cold hardiness, often proving reliable into USDA zone 4. It grows most vigorously in well-drained organic soil but will tolerate heavier soils with only moderate drainage, and though it appreciates regular moisture it is capable of withstanding considerable dry periods. It prefers acidic conditions but performs adequately

in neutral to slightly alkaline soils. Though its height in cultivation rarely exceeds 3m, it is still a fairly large shrub with limited utility for smaller gardens.

Seed production in cultivation is relatively low, but this species can also be propagated by softwood cuttings.

Cultivars of *F. major*

F. major 'Arkansas Beauty' was introduced from a disjunct Arkansas population growing in relatively dry habitat. Though durable it is a sparse bloomer with inferior autumn colour.

F. major Mystic Harbor 'KLMG' is a large shrub.



Rick Clarke

Fothergilla major (left), *F. x intermedia* (centre) and *F. gardenii* (right). The intermediate nature of the hybrid means that garden plants can be difficult to identify

Fothergilla x intermedia

The recent horticultural renaissance of *Fothergilla* can be traced to lines of compact plants that began appearing within the US nursery scene in the late 1970s and early 1980s. Grown from open-pollinated seed obtained from nursery plants of *F. major* and *F. gardenii* growing in proximity to one another, the seedlings were selected for compact size, vigour, prolific bloom and good autumn colour. Some growers continued the lines through cutting propagation and others sold select seedlings, but most of these plants were offered simply as *F. gardenii* and called dwarf fothergilla. This identity was not questioned at the time but the plants were clearly intermediate in a

number of traits.

The new plants filled a niche previously unoccupied by *Fothergilla*. Typically under 1.5m tall even after a number of years growth, their compact size was ideally suited for small residential gardens. Their adaptability to a wide range of soil and moisture conditions meant they could be planted without great care in a variety of garden settings and still remain healthy and attractive. They were even durable enough to be used in sweeps, masses, and for hedging and enclosure, and vigorous enough to withstand aggressive pruning or periodic shearing to the ground when design imperatives dictated even lower height. They were truly, reliably, four-season

shrubs offering fragrant spring flowers, neatly attractive summer foliage, unsurpassed autumn colour, and pleasing winter architecture.

The availability of these new fothergillas coincided with the increasing momentum of the native plant movement in the US, which encouraged gardeners and landscape architects to redirect their focus to the diversity of the North American flora. Although this flora is rich with shrubby species, few rival the all-around utility of the best fothergillas.

Another turning point was Michael Dirr's introduction of *Fothergilla* 'Mount Airy'. Here at last was a named cultivar with the most desirable characters of the new compact types. Selected by Dirr

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from a plant growing at Mount Airy Arboretum in Cincinnati, Ohio, 'Mount Airy' possessed an additional, fundamentally important trait: it was especially amenable to cuttings propagation, providing the nursery industry with a supremely marketable shrub that could be produced economically in large quantities and that presented itself well as a young container plant.

Fothergilla 'Mount Airy' was variously offered as *F. gardenii* and *F. major*, adding to the growing debate about whether these intermediate plants might be hybrids.

Decades earlier, Richard Weaver had determined that *F. gardenii* was a tetraploid (with 48 chromosomes) and *F. major* was a hexaploid (with 72 chromosomes) (Weaver 1969). He brought this up in conversation with Tom Ranney at North Carolina State University's Mountain Horticultural Crops Research and Extension Center a few years ago and Ranney subsequently launched a study to settle the debate. Working with Nathan Lynch, Paul Fantz, Paul Cappiello and other staff at the Center, the University, and Yew Dell Gardens, Ranney used flow cytometry to determine ploidy levels (chromosome number) of 17 different cultivated taxa of *Fothergilla*. Flow cytometry is a method of sorting cells in a stream of fluid that allows ploidy level to be determined.

The results of this study (Ranney *et al.* 2007) are both profoundly illuminating and somewhat unsurprising: the majority of commercially available cultivars are pentaploids: hybrids with 60 chromosomes. In the same article, the new hybrid species *F. x intermedia* is named and described. This name can now be adopted for hybrid fothergillas. Though individual testing would be required for absolute proof, it is



Rick Darke



Rick Darke

The inflorescences of *Fothergilla x intermedia* (top); in both species and the hybrid they are fragrant, appear in late spring and are composed mainly of stamens. The intensely glaucous leaves of *F. x intermedia* 'Blue Shadow' (above) will further excite renewed interest in the genus

reasonable to assume that a high percentage of intermediate plants offered commercially in recent decades as *F. gardenii* are actually *F. x intermedia*. The cultivars in this article are grouped according to the conclusions of Ranney *et al.* (2007).

Cultivars of *F. x intermedia*

F. x intermedia Beaver Creek

(‘KLMtwo’). Raised by plant breeder Roy Klehm, this cultivar is compact and rounded in form, remaining under 1.2m in height after a decade of growth. Its blue-green summer foliage turns bright yellow to red in autumn.

F. x intermedia ‘Blue Shadow’ is without question the most dramatic new *Fothergilla* and perhaps one of the most promising new shrubs yet to appear in the current century. Introduced and patented in the US by Gary Handy of Handy Nursery in Oregon, it originated as a branch sport from ‘Mount Airy’. It is similar to ‘Mount Airy’ in most characteristics except the leaves, which emerge green, quickly maturing to an intense powder blue that almost has to be seen to be believed. The colour rivals that of other glaucous plants such as *Zenobia pulverulenta* and even *Senecio serpens*. Although relatively easy to root from cuttings, this plant has also been tissue-cultured to meet demand more quickly.

F. x intermedia Eastern form was introduced to cultivation years ago as *F. gardenii*. It is an unremarkable example of the hybrid.

F. x intermedia May Bouquet

(‘KLMsixteen’). Roy Klehm selected this hybrid primarily for its unusually abundant 5cm-tall flower spikes. Autumn colour is typically clear yellow to apricot.

F. x intermedia ‘Mount Airy’ is a benchmark against which other intermediate hybrids are judged. Introduced by Michael Dirr from

a plant growing at Mount Airy Arboretum in Ohio, it is rounded in form, growing 1.8m tall at maturity, with abundant fragrant flowers, deep blue-green summer foliage and consistently vibrant red or orange-red autumn colour. Although many unnamed intermediate hybrids in commerce match it in ornamental characters, ‘Mount Airy’ is a certain performer and one of the easiest to propagate. Paul Cappiello has observed that this plant is so easily rooted in the southeastern US, the window for taking cuttings extends from May into September.

F. x intermedia ‘Red Licorice’ is relatively small-leaved and low-growing. Selected for its dark red autumn colour, it was introduced from Kentucky’s Bernheim Arboretum by Paul Cappiello and John Wachter.

F. x intermedia Red Monarch

(‘KLMfifteen’). Growing 2.4m tall at maturity, this Roy Klehm introduction is larger than many of the hybrids, with reliable deep orange-red autumn colour.

F. x intermedia ‘Sea Spray’ reaches 1.5m or more at maturity, and has summer foliage that is more blue-green than average. The autumn colour is muted.

F. x intermedia ‘Windy City’ is a recent midwestern US introduction with green summer foliage and cold-hardiness into USDA zone 4.

The future of *Fothergilla*

The diversity and durability of material now available will ensure *Fothergilla* never again recedes into

obscurity. The broad appeal and utility of the hybrids will continue to elevate this distinctive genus in the world rank of ornamental shrubs. It is hoped that continued development of this genus will result in an even greater range of unique and proven selections.

Further introduction of plants with known provenance, and a better understanding of the ecological context of the species, will contribute to their more effective cultivation and to the roles they will play in designed spaces and conserved places.

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