

Collection Profiles

Fir Collection at the Morris Arboretum of the University of Pennsylvania

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When visitors come to the Morris Arboretum, they are impressed by diversity of our collections: our statuesque mature specimens integrated into a young and vibrant collection, all within the setting of a historic landscape. One of our largest and most apparent collections is the wide array of conifers that are growing throughout the Arboretum. Included in these conifer collections are over 70 taxa of *Pinus*, 50 taxa of *Picea*, 40 taxa of *Chamaecyparis*, and 29 taxa of *Abies*.

In 2002, AABGA recognized the Morris Arboretum as the holder of a national collection of *Abies*, as part of its North American Plant Collections Consortium (NAPCC), a growing network of botanical gardens and arboreta dedicated to increasing the awareness of the value of plant collections for germplasm preservation and to coordinating conservation efforts. Through NAPCC, institutions gain recognition for their significant collections and promote their value nationally.

Scope of the Collection

Our goal for the fir collection is to display a diversity of fir species and to evaluate them for their adaptability to the Mid-Atlantic region. This collection serves as a teaching, display, and research resource for the public and professional visitors and demonstrates the range of species available for gardens in the area.

The collection focuses on species and not cultivated varieties of *Abies*. We currently hold 29 taxa of the genus. Several of our historic fir specimens are among the largest of their kind in eastern North America and are clearly well adapted to the growing conditions of the Mid-Atlantic. We continue to add to our collection through plant exploration, especially in Korea and China, and through plant exchanges. As a result, we currently



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Top: Mature conifer specimens, from left to right, *Abies cephalonica*, *Picea orientalis*, and *Abies nordmanniana*

Bottom: Closeup of *Abies pinsapo* needles

hold 23 wild-collected taxa of *Abies* and anticipate continued participation in these trips and exchanges. Many of the firs are planted throughout the Arboretum, but a large number are growing in our greenhouses until they reach sufficient size to be planted out. Our collection represents the breadth of distribution of firs, with some from North America, Europe, Asia Minor, and Asia.

The conditions at the Morris Arboretum include acidic and well-drained soils, a variety of topography and associ-

ated microclimates. Rainfall averages approximately 45 inches (1140 mm) yearly, and there is regular snow cover. Moderately cold winters (USDA Zone 6B, average annual minimum temperature of -10° F) and warm summers allow us to grow plants adapted to warmer climates as well as some of the most cold-hardy members of the genus. Because firs are generally montane and subalpine species, cold-hardiness is not a limiting factor for us for many of the fir species from the north temperate regions; what are limiting factors are our summer temperatures and our hot summer evenings, which are stressful for this genus.

Many of our mature fir specimens such as *Abies cephalonica*, *A. holophylla*, and *A. homolepis*, date from the Victorian estate of John and Lydia Morris's time. The origin of these plants is unclear although we know that John Morris purchased plants from Veitch nurseries in England as well as Andorra Nurseries in Philadelphia, and received plants from the Arnold Arboretum's early plant expeditions. One of my favorite old trees is a specimen of the needle fir (*A. holophylla*) from 1937 with a diameter at breast height (DBH) of 40 inches. Named for its sharply pointed needle tips, this species is native to China, Korea, and southeast Siberia.

Thanks to significant plant exploration efforts in Asia during the past two decades, the greatest growth and richness of our collection is in species of Asian origin, such as *Abies fargesii*, *A. firma*, *A. nephrolepis*, and *A. recurvata* var. *ernestii*. For example, we have several young vigorous plants of *A. holophylla* collected on a 1981 expedition to Korea and others collected on a 1986 expedition to Jilin province, in northeast China. Extremely tolerant of drought and heat, these show great promise as a landscape fir for Philadelphia and areas south of us.



Three young *Abies holophylla*, in foreground, wild-collected in 1981 and 1986, respectively.

Future Development

Among the taxa that I am especially interested in adding are those from the Mediterranean region, Balkan and Caucasus Mountains, and Asia Minor. We have a few species from these areas that show great promise in adapting to the Mid-Atlantic region. Among the best of the Mediterranean species is *A. cephalonica*, native to Greece but well suited for our area. Our towering specimen has a 39-inch DBH and is over 100 feet tall. Its dark green needles show no signs of stress in our summers. Because of its ultimate size, Greek fir is suitable mostly for large spaces.

Arguably the best fir for the mid-Atlantic is the Nordmann fir (*A. nordmanniana*), a handsome species with deep black-green needles. The Nordmann firs exemplify our NAPCC goals of sustaining older plants in our collection while seeking out new sources of documented plants. Growing in the Arboretum are old specimens, including a 40-year-old specimen of *A. nordmanniana* ssp. *equi-trojani* collected in Turkey, and some very young plants still growing in our greenhouses, also collected in Turkey.

Among the many beautiful firs from which to choose, my favorite is the Spanish fir (*A. pinsapo*), a slower-growing species native to both sides of the

Straights of Gibraltar. Native to a region with hot summers, *A. pinsapo* is well adapted to growing in our area, and its growth rate makes it suitable for modestly sized gardens. Spanish firs have beautiful short, blue-green needles that spread radially from the branches at nearly right angles and are accentuated by the upright purple cones in spring. Although Spanish fir reaches 70 feet or more at maturity, two plants at the Morris are about 45 feet tall but less than 20 feet wide after 40 years. Our plants are of nursery origin, and I am very interested in obtaining documented plants of both *A. pinsapo* and *A. pinsapo* var. *marocana*, from North Africa.

Few North American firs perform well for us. The biggest exception is *A. concolor*, the white or Colorado fir; this species is native to the mountains of the western United States and has graceful blue-green needles. The balsam fir (*A. balsamea*), our lone native Pennsylvanian fir, is a common Christmas tree but is not well adapted to our summers. In contrast, *A. balsamea* var. *phanerolepis*, a variety of balsam fir from northern Virginia and West Virginia, is considered more tolerant to heat and heavy soils than the species. We have several 10-year-old plants growing in a stressful site, and I am eager to observe their

long-term performance.

Our firs are not without their growing challenges and problems. Several of the species are prone to mite or scale infestations, which we monitor and treat judiciously. Several summers of drought and severe heat have taken their toll on our plants, and last year's moderately cold winter injured some of our marginally hardy plants. I accept these problems as vicissitudes of gardening and part of the evaluative process that provides ongoing opportunities to renew the collection and plant new taxa.

I like to think that our commitment to our fir collection continues the work that the Morrises began over 100 years ago. We are fortunate to have a diversity of sites within the Arboretum that allow us to pursue the goals of sustaining and building this collection. We plan to maintain the health of our stately old and middle-aged specimens, ensure the future of our younger specimens, and continue to grow and evaluate species not commonly found in our region. I look forward to collaboration with other gardens interested in growing this wonderful genus and to sharing the beauty of these plants with garden visitors.

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