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The Myth of Uniform Plant Performance
“Nursery tags are an accurate indicator of final plant size”

The Myth

Autumn is here and for those of us in Mediterranean climates this is the ideal time to plant trees and shrubs. Tree selection can be a tricky practice, especially when site conditions constrain size of plantings. Parking strips, traffic circles, pocket gardens, and other small landscapes require small-scale plantings. At the nursery, one can be overwhelmed by the variety of broadleaf trees and conifers, and even within a species there may be several cultivars from which to choose. Without any prior knowledge of these plants, consumers resort to nursery tags to determine mature heights and widths. Armed with this information, one can select those trees and shrubs whose scale is appropriate to the site. But does this approach really work?

The Reality

Many factors will determine the mature size of any tree or shrub. The most obvious influence on plant size is genetic makeup – you only have to look at cultivar names like ‘Midget’ or ‘Giant Candles’ to understand this component. Geographic location also plays a major role in determining height. For instance, trees tend to grow taller in areas where temperatures are more moderate; trees in coastal areas are generally larger than these same species in more continental regions. Within a geographic range, local climate will further influence final size: rainfall and temperature can vary widely within a region as a result of local topography. The microclimate of a site will influence tree size due to differences in environmental factors such as drainage, soil type, and aspect. Finally, competition for water, light, nutrients, and other essentials will affect not only growth rate but final height as well.

To illustrate the interaction among these various factors, let’s examine a common ornamental tree with an ancient lineage: *Ginkgo biloba*, the only existing species in the Ginkgo family. *Ginkgo biloba* is an excellent choice for many urban landscapes, as it is relatively resistant to air pollution, insects, disease, and other environmental stresses. The first three taxonomic keys I looked at reported *Ginkgo biloba* would reach (a) up to 100 feet, but usually less; (b) over 100 feet; and (c) 130 feet. Confused, I would probably visit a nursery (or the internet) and look at the tag information to determine plant size. Here I might find a tag such as that from a Nebraska nursery giving a mature height of 40-70 feet. But should I believe this information any more than that in the literature? Looking further on the internet, I found US state champion ginkgoes from a number of locations:

- 90 feet: Tennessee state champion
- 80 feet: Alabama and Ohio state champions
- 72 feet: Texas state champion
- 57 feet: Arkansas state champion
- 24 feet: North Dakota state champion

And in Japan is a thousand year old specimen topping out at 164 feet!

Clearly, there is no one “mature size” for trees, especially trees grown outside their native habitat. From the state champion data, it appears that colder climates (e.g. North Dakota) produce smaller ginkgoes, but other factors besides winter temperature influence mature size (why is the state champion of Tennessee so much larger than that of Arkansas?). The lack of consensus among tree identification guides, taxonomic

literature, nursery tags, and real-life landscape specimens underscores the fallacy of assuming a uniform maximum height for any species, variety, or cultivar of any tree or shrub. The geographic location of the information source (e.g. the production nursery or the tree guide author) can greatly influence the reported attributes of the species in question.

So how does one predict how tall a tree or shrub will get in their landscape? The best way is to observe the plant of interest in your region – how tall does it get? How wide is its crown? After many of these observations you will have a predictive range of heights to use. If there are not enough specimens in your area, or they are not mature, explore the web for information on plant performance in other geographic regions with similar climate conditions. Those of us in the moderate Pacific Northwest region know we have a Mediterranean climate, and could look towards those countries for information on plant performance.

The Bottom Line

- There is great variability within print resources regarding mature tree height
- Production nursery tags most likely contain species performance information relevant to that nursery's geographic location
- Genetics, geography, climate, and plant competition will all influence the maximum height any specimen will obtain
- To determine the most likely height range for a tree in your landscape, observe how that species performs elsewhere in your location
- If no local landscape specimens exist for a particular plant, look to the internet for plant performance information from similar climates elsewhere in the world.

For more information, please visit Dr. Chalker-Scott's web page at <http://www.theinformedgardener.com>.