

Zoo Horticulture: Growing Plants with Wild Appeal

Eric Shealy

Riverbanks Zoo and Garden, 500 Wildlife Pkwy. Columbia, SC 29210, USA

eshealy@riverbanks.org

Keywords: Animal/plant interactions, conservation, plant toxicity, aesthetic use, functional use, plant database, *Hymenocallis coronaria*

Summary

This is a general overview of zoo horticulture and the challenges that horticulturists and plant production workers face dealing with this side of public horticulture. Riverbanks Zoo and Garden provides a unique confluence of public horticulture having both the botanical garden and a zoo, both of which are heavily planted. Challenges arise in each area of design and production to account for plant toxicity, aesthetic use, functional use, and conservation. Plant toxicity is chief among the concerns with the zoo and aesthetics, of course, are

the main concerns for the botanical garden. We have a database that keeps all information about plant placement and installation, as well as other helpful cultural and conservation information. Animal interactions with plants can be complex and exhibit design needs to be able to meet these challenges while providing the animal with a wonderful habitat and the visitor with a great guest experience. Plants that we particularly find helpful in these endeavors will be discussed, as well as our conservation efforts towards two native perennials.

INTRODUCTION

Zoo horticulture is gardening and landscaping activities that occur within zoos and aquarium settings. It is a complex area of horticulture that focuses immensely on creating habitat for zoo animals while engag-

ing guests with excellent displays and framing the animal in a setting that, as closely as possible, mimics the animal's native habitat (**Fig. 1**).



Figure 1. (Left) African lowland gorilla with *Arundo donax* and (right) kangaroo with *Acca sellowiana*

Plant toxicity to animals is always at the forefront of plant selection, followed closely by plant/animal interaction. Toxicity is very dependent on the animal as well as the plant. Since we have mammals, invertebrates, reptiles, fish, and birds on display, all these exhibits can be very diverse, plant-wise. What is toxic to one category of animal, is not to another. Reptiles are known to eat many things that would be deadly to mammals, so you will often find some commonly known toxic plants in those exhibits.

Horticulture in zoos is also public gardening, in that there are a wide variety of public spaces that need to be planted or screened or direct the guest's view toward exhibits. Guest experience is key with this side of public horticulture, and although guests might not realize it, horticulture plays a key role in making the zoo feel like "habitat."

Plant selection

Toxicity is always key in plant selection, but having animals interact with plants is one of the keys to successful exhibit spaces. Choosing plants that animals have direct access to is determined by how the animal will utilize the plant. Plants in exhibits can also provide a route for an animal escape, and that with toxicity are the ultimate concerns. Hotwire and electrical fencing are commonly used to keep animals away from key plants in an exhibit, mostly so those plants have a chance to reach their full aesthetic potential. Some plants are made to be sacrifices for the good of the design. An animal on exhibit for extended periods of time will ultimately become bored and will destroy plants. Planting in substantial numbers is a strategy to help plants establish and recover, along with hotwire. Horticulturists in exhibit spaces are also responsible exhibit “furniture,” which means anything non-living that is brought in for animals to perch on or interact with in a permanent capacity. Examples of this include boulders, tree trunks, wooden structures, etc.

Database

Riverbanks has a plant registrar that utilizes Filemaker® Pro to organize and catalogue all plants that are installed in exhibits, public spaces, and the botanical garden. The database also generates all production information and facilitates the growing of all plants for the zoo, garden, and our annual plant sale. Riverbanks stores conservation information for any plants that are in our collection and are significant to state or federal agencies.

Growing challenges

Growing for a zoo and botanical garden is a wide varying job and requires the grower to be very versatile. Individual gardener requests and exhibit needs drive plant production at the growing center, and monoculture is not seen in our production facility. Timing plants to be installed in public displays and in exhibits is hampered by exhibit maintenance or renovation and staff time to plant. Riverbanks uses a river water irrigation system that delivers water from the Saluda River to both the botanical garden and the zoo. This system has its own challenges ranging from debris encroachment from the river on high flow days to pump failures that can take the system down for hours to weeks. Staffing shortages have also affected our ability to maintain and install plants and exhibits.

Challenges in exhibits

With new exhibit design, horticulturists are usually the last crew to get onto the project. But while horticulturists are the last ones to be on site, they usually must lay out clear guidelines for other crews to follow. Chief among these are access points for exhibit maintenance to allow for people and machinery to move easily into these spaces. Irrigation access points are also a major concern. In established exhibits, the time when a horticulturist can maintain plants on exhibit is dictated by animal welfare and keeper allowance. If a bird is nesting, or keepers are unable to pull animals off exhibit, then horticulturists cannot maintain plants.

Common plants used at riverbanks

- *Sabal minor*
- *Taxodium* sp.
- *Eucalyptus nicholii*
- *Muhlenbergia dumosa*
- *Daphniphyllum macropodum*
- *Vaccinium darrowii* ‘Rosa’s Blush’
- *Leucophyllum frutescens*
- *Rudbeckia maximillianii*
- *Hemerocallis* ‘Autumn Minaret’
- *Acca sellowiana*
- *Carex divulsa*
- *Olea* ‘Arbequina’
- *Hibiscus syriacus*
- *Chimonanthus praecox*
- *Camellias/Sasanqua*

Conservation at riverbanks

Riverbanks, with the help of state entities, conserves two different species: *Helianthus schweinitzii* and *Hymenocallis coronaria* (Fig. 2). Schweinitz’s Sunflower grows mostly on disturbed roadsides and forest edges and is usually endangered from construction of roads and bridges in the state. It is a valuable plant to the Catawba Native Americans, and we have worked to propagate and multiply plants for reintroduction

to Catawba lands near Charlotte, North Carolina. *Hymenocallis coronaria* is a threatened species that exists in rocky outcrops in rivers above or on the fall line in South Carolina, Georgia, and Alabama. A group of horticulturists collect seed every year and grow them out for reintroduction in the spring of the following year.



Figure 2. (Left) *Hymenocallis coronaria* observed in the field and (right) growing on from seed in the nursery.