

# The Plum Bayou Garden

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Sumpweed (*Iva annua*) growing at Toltec Mounds today

For many thousands of years the Indians of Arkansas made intensive use of wild plant resources in their environment, from the nuts that grew in hardwood forests, to edible forbs, fruits, and berries, as well as plants whose purpose was primarily medicinal or for crafts. Many archeologists and Southeastern peoples argue that sophisticated systems of landscape and plant management were integrated into the lifeways of early hunter/foragers—for example, using fire to manage forests and increase nut or mast yields, or building semipermanent fish runs to funnel fish into well-placed fish traps. Research to understand these earliest systems of landscape management is ongoing. Paleoethnobotanists (archeologists who study ancient plant use by human societies) have demonstrated that by 3000 years ago the Native American communities of Arkansas had domesticated and cultivated local crop plants and were increasingly relying on gardening as a critical aspect of their foodways. By the Late Woodland period (c. AD 600–1000), the Plum Bayou peoples who lived at Toltec Mounds and throughout

the Central Arkansas River Valley were using some of the plants that archeologists refer to as the Eastern North American (ENA) Crop Complex.

The ENA Crop Complex includes goosefoot (*Chenopodium berlandieri*), sumpweed (*Iva annua*), sunflower (*Helianthus annuus*), squash (*Cucurbita pepo* var. *ovifera*), erect knotweed (*Polygonum erectum*), maygrass (*Phalaris caroliniana*), little barley (*Hordeum pussillum*), and bottle gourd (*Lagenaria siceria*). Each of these plant species has a slightly different history of domestication, some having been in use longer than others. Bottle gourd, for example, is understood to be the earliest cultivated plant in the southeastern United States and was probably grown more for its use as a reliable container than as a food source.

While most people are familiar with the late prehistoric and early contact period “Three Sisters” garden (maize, beans, and squash), far fewer are familiar with the deep history of gardening, farming, and plant domestication that mark a profound innovation in



Southeastern societies thousands of years before Europeans arrived. Maize, so widely understood today as a staple in Southeastern Indian foodways, did not become a staple crop until approximately AD 1000, and even then was not uniformly important across the Southeast. Maize and other tropical crops were in fact added into an already ancient tradition of plant tending and management. The Plum Bayou Garden seeks to give visitors a glimpse of what this Woodland period gardening may have been like by highlighting the native plants that were domesticated across the Southeast thousands of years ago. The Plum Bayou Garden also features some technologically important plants that were critical for the production of textiles, such as bags, nets, shoes, and even finely woven cloth.

### **The Earliest Gardeners**

It is not clear when the first intentional gardens were created by the Indians of Arkansas, but botanical evidence from the Ozark Plateau demonstrates that by 3000 years ago people were harvesting, cleaning, and storing fully domesticated crop seeds along with wild plant resources. It is possible that intentional management of these plants had begun much earlier, leading to their domestication. Today, these ENA crops are largely extinct, but their wild ancestors can still be found across the landscape, often in highway ditches and other disturbed areas. Many of these are plants that we view as “weedy,” but their ancient, now lost, crop cousins were vital sources of nutritious oily and starchy seeds. A small number, like sunflowers and some types of squash, remain as staples of our modern day agriculture and foodways.

Unlike the large fields typical of “row crop” agriculture, where the land is used year in and year out for production, the earliest gardens would likely have been mixed spaces with multiple kinds of crop plants, as the Plum Bayou Garden is today. They may also have been places where people transplanted or seeded non-domesticated plants that were important for religious, medicinal, and technical uses so that these resources would be close at hand. We don’t know exactly what these Woodland period gardens would have

looked like—whether plants were all sown together, or plants and resources considered similar were grown in distinct areas—but the term “garden” is the best way to think about these cultivated spaces, where people planted, tended, weeded, and harvested important plant resources.

Forest clearing may have been part of the cultivation process of these plants—especially for the sun-loving, weedy annuals. Today, small-scale subsistence farmers and gardeners in some parts of the world use a form of “swidden” or “shifting” gardening, a pattern that provides a useful analogy for how earlier Woodland period Indians in Arkansas may have used the land. This involves clearing a plot of forest, using it for a few seasons to grow economically useful plants, and then allowing it to go “fallow” while a new plot of forest is cleared and the cycle starts over. This technique, practiced with stone axes and fire as the only means for felling trees, did not result in large swathes of abandoned “clear cut” forest devoid of life; rather, it may actually have helped to increase biodiversity by creating a patchwork of sun-drenched openings under forest canopies, thus allowing for the successional growth of a wide variety of forbs and grasses and providing habitat for foraging animals. The fallow plots may have been revisited for naturally reseeded annuals, mature fruiting shrubs and trees, nut trees, medicinally useful perennial forbs, and possibly even for hunting.

### **Paleoethnobotany and the Study of Domesticated Crop Plants**

Whether a plant is considered “domesticated” depends in part on the presence of observable changes in the morphology of the seeds and fruits, such as size and shape. Paleoethnobotanists have been researching some of these economically useful plants for many decades and have established morphological criteria for species now understood to have been locally domesticated by the end of the Archaic period (c. 600 BC). These criteria include changes such as increased seed size in goosefoot, sumpweed, and sunflowers and the loss of hard shell rinds in squash. Other measurable



changes include thinner seed coats (the outermost layer of a seed) in goosefoot, as well as changes in shape of the seed edges (truncated or squared off margins).

The use of sophisticated DNA analysis is allowing researchers to understand the processes of domestication and to more precisely identify the wild ancestors of domesticated plants. But these studies are limited to plant remains recovered from contexts where organic materials are well preserved. Paleoethnobotanists are unable to use the burned, carbonized plant remains from open sites like Toltec for DNA analysis, but the well-preserved, desiccated plant materials collected by the University of Arkansas Museum in the 1930s from the Ozark Plateau are suitable and constitute a critical resource for the study of plant domestication in the southeastern United States.

Some of the plants cultivated for food sources, such as maygrass and erect knotweed, may not have been fully domesticated—it is unclear whether there are definable morphological changes between the modern wild plants and the archeological remains. But these seeds appear with such frequency at archeological sites, and are so often found along with domesticated species such as goosefoot, it is clear that these plants were important in ancient foodways, and most likely were included in the gardening and farming practices of the region.

### **The Plum Bayou Gardeners and Foragers**

The Arkansas Woodland period gardeners may not have used all the plants that make up the ENA Crop Complex. Some groups may have used only a select few of them, while others may have been planting and tending all of them. Dr. Gayle Fritz (Washington



Sumpweed (*Iva annua*), drawing by Jane Kellett

University in St. Louis), a paleoethnobotanist who has worked extensively across the southeastern United States, identified plant remains from Toltec Mounds that indicate Plum Bayou peoples were using most of the ENA crop plants seen at other sites across Arkansas. In addition to hunting and foraging, they used goosefoot, erect knotweed, little barley, squash, maygrass, sunflowers, and sumpweed. Excavations of Mounds S and D at Toltec Mounds have yielded very small quantities of maize, indicating that the Plum Bayou peoples at Toltec Mounds had access to this crop. Given its rarity at the site, it is unclear if the people were actively cultivating maize. Perhaps instead they were acquiring it from neighboring groups in Arkansas. The small quantities of maize recovered at the site,

and the fact it is associated specifically with mounds, suggest that maize was not a part of the everyday diet of Plum Bayou peoples. Instead, maize may have been an exotic or “ceremonial food,” acquired and consumed only in the context of special feasting events at Toltec.

Dr. Fritz also discovered that Plum Bayou peoples were intensively using a still unidentified cereal grain—a grass seed—now known simply as “Type X.” The Type X grass seeds have been found in extremely large numbers in excavations at Toltec Mounds, as well as at other associated sites. These seeds are significantly larger than any known modern native grass. Radiocarbon dates obtained from Type X grains indicate their contemporaneity to the occupation at Toltec Mounds. Currently we understand this grass seed to have been domesticated in the Central Arkansas River Valley during the Woodland period. The study of this enigmatic grass seed continues to this day, as paleoethnobotanists work to identify the wild progenitor of



the Type X grain, and exactly how early it was domesticated and how long it was cultivated before dropping out of use and going extinct.

In addition to grasses (grains), Woodland period Indians of the Arkansas River Valley also collected a wide variety of wild edible fruits and berries, as well as possibly tubers and greens, plus plant fiber resources for craft use, and medicinal plants. Some of the wild food plants that have been documented at Toltec Mounds include blueberries (*Vaccinium sp.*), blackberries/dewberries (*Rubus sp.*), plum or cherry (*Prunus sp.*), grapes (*Vitis sp.*), persimmon (*Diospyros virginiana*), elderberry (*Sambucus canadensis*), sumac (*Rhus sp.*), wild potato (*Ipomea sp.*), and maypops (*Passiflora incarnata*), as well as nuts such as acorn and hickory.

Other Woodland period sites in Arkansas, such as the dry rockshelters of the Ozark Plateau, give us a glimpse of how other wild plants were used for technological purposes. Though textiles have not been preserved at sites like Toltec Mounds, the Plum Bayou people too were probably processing, spinning, and

weaving baskets, mats, and other products out of fiber from locally available plants such as milkweed (*Asclepias sp.*), dogbane (*Apocynum cannabinum*), and rattlesnake master (*Eryngium yuccifolium*)—all of these have been documented as fiber sources for Woodland period textiles in the Ozark Plateau. These plants would have provided the fiber to make hunting and fishing nets, woven bags, clothing, and even shoes. Other fiber resources may have included pawpaw trees (*Asimina triloba*) as well as rivercane (*Arundinaria sp.*). Pawpaw, known more for its papaya-like fruit, was used for both food and fiber. The bark would have been stripped from the trees and then processed over many months into fine thread and yarn to use for weaving items like robes and bags and making nets. Rivercane, the only North American member of the bamboo family of plants, is still used extensively by Southeastern Indians to weave beautiful, sophisticated basketry. The archeological record of the Ozark Plateau and elsewhere in the Southeast demonstrates that this tradition of rivercane basketry is many thousands of years old.

## The Plum Bayou Garden at Toltec Mounds State Park

Many of the plants in the Plum Bayou Garden are permanent plantings. These are identified by both common name and scientific nomenclature on a metal plant tag staked into the ground. Others are plants we are growing for experimental or comparative purposes and will have smaller plastic tags identifying them by name and giving information about their role in the garden project. Look for these tags when you are enjoying the garden to help identify which plants are food sources, which are fiber sources, and which were once a part of the Eastern North American Crop Complex. For more information on any active studies being carried out in the garden you can go to [www.archeology.uark.edu](http://www.archeology.uark.edu) and click on “current research.”

For public programming and workshops available at Toltec Mounds Archeological State Park, please visit [www.arkansasstateparks.com/toltecmounds/](http://www.arkansasstateparks.com/toltecmounds/).



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