

Planting Little Barley at Mission Garden

In the winter of 2020, Mission Garden volunteers re-engineered the Early Agriculture/Hohokam garden area to interpret how the Native Americans along the Tucson Basin floodplain created flood-irrigated cells, or waffles, in which to plant their crops during the monsoon season. Having completed the waffles, we recognized that we would need some sort of cover crop to protect the soil from the intense Sonoran Desert sun until we could plant in the summer.

Ethnobotanist Martha Burgess joined us to help plan the types of plants. She learned that her friend, Gita Bodner, Conservation Ecologist at The Nature Conservancy, had obtained Little Barley seed from their Aravaipa Preserve area and was interested in learning more about the characteristics of this grain crop grown by Native Americans until 700 years ago.

On January 25, 2020 we spread four ounces of Little Barley seed both in the irrigated waffles and on the surrounding ground. We are now monitoring the phenology of the plant. Gita has expressed the hope of publishing a research report on Little Barley.

Cultivation of Little Barley in the Southwest by native populations appears to have ceased by the time of Spanish arrival in this region and subsequent Spanish introduction of Old World Barley for agriculture. The following excerpts, extracted from two recent publications, provides background information on past cultivation and use of Little Barley in the Southwest.

Anna F. Graham, Karen R. Adams, Susan J. Smith & Terence M. Murphy (2017) A New Record of Domesticated Little Barley (*Hordeum pusillum* Nutt.) in Colorado: Travel, Trade, or Independent Domestication, KIVA, 83:4, 414-442, DOI: 10.1080/00231940.2017.1376261

Accounts of Columbus' early voyages to the Americas detail barley as one of the crops brought from the Old World (Dunmire 2004). A little more than a hundred years later, this Old World barley reached the Southwestern U.S. via the Spanish. Documents show that Old World barley was introduced to New Mexico between 1598 and 1630 AD (Dunmire 2004:176). The earliest citation for Old World Barley in Arizona is 1701 AD, based on evidence embedded in adobe bricks at the Mission in Tumacacori, Arizona (Hendry 1931). Likewise, Spanish accounts demonstrate the introduction and subsequent usage of Old World Barley in California sometime before 1795 AD (Dunmire 2004:299).

The level of use of domesticated Little Barley in central and southern Arizona fluctuated through time. Use peaked in the pre-Classic period (AD 700–1150) and declined through the Classic period (AD 1150–1450). No evidence has been found in the Southwest U.S. for continued use of domesticated Little Barley into the historic period (Doebley 1984). This is one of many examples of a domesticated plant that faded from human subsistence practices prior to the historic era (Minnis 2014).

Little Barley was an important ancient food for a number of reasons. It offered a late spring resource in a normally food-stressed time of year. It provided nutritional constituents similar to those of the modern barley of commerce. The plant is widely distributed across North America and is already at home on the continent. Little Barley may well be resilient in the face of environmental (i.e. global warming) and biotic (insects and other predators) changes by virtue of its adaptation here over millennia. Although it appears that prehistoric domesticated Little Barley was fading from the list of human foods during protohistoric and historic eras, it could conceivably be redomesticated by observant humans surveying wild populations.

Karen R. Adams, “Chapter 5. Little Barley Grass (*Hordeum pusillum* Nutt.): A Prehispanic New World Domesticated Lost to History,” in *New Lives for Ancient and Extinct Crops*, edited by Paul E. Minnisi, The University of Arizona Press, 2014.

In the American Southwest, the story of domesticated little barley grass is equally as old and as interesting. This document updates and expands a previously published framework for considering little barley domestication

(Adams 1987). For most of the twentieth century, archaeological focus in this region has been on understanding the history and life-changing impacts on local forager populations as they acquired Mesoamerican domesticates and transitioned into settled and committed agriculturalists. Current evidence suggests that maize (*Zea mays* L.) entered the region around 2200 BC and was quickly adopted by groups living on the Colorado Plateau (Huber and Van West 2005; Smiley 1994), in east-central Arizona (Huckell et al. 2001), and in the Tucson Basin (Mabry 2006). Squash (*Cucurbita pepo*) may have entered around the same time (Mabry 2005, 2008), although current well-dated squash remains indicate presence in the region no earlier than 1490 BC, or approximately six hundred years following the entry of maize (Simmons 1986, Wills 1988). Other Mesoamerican domesticates followed, including grain amaranth (*Amarantus cruentus*) by approximately 600 BC (Bohrer 2007), common beans (*Phaseolus vulgaris*) possibly by 600 BC (Tagg 1996; Wills 1988), bottle gourd (*Lagenaria siceraria*) by 300 BC (Cutler and Whitaker 1961), and cotton (*Gossypium hirsutum*) by AD 300 (Elson and Clark 1995). Although new data are likely to adjust these entry dates, the adoption of Mesoamerican cultivated crops appears to have occurred as a series of separate events over a 2,000-year period (Merrill et al. 2009). The impacts of the introduction of each crop to local foraging groups varied by the crop and by region, resulting in a wide array of farming strategies ranging from casual crop management by semimobile groups to settled farming communities of committed agriculturalists.

This review of Mesoamerican domesticates sets the stage for considering the importance of domesticated crops developed from indigenous plants, many of which can contribute to spring or early summer diets. A number of native annual plants in the American Southwest, among them little barley grass (*Hordeum pusillum*), tansy mustard (*Descurainia*), milkvetch (*Astragalus*), maygrass (*Phalaris*), woolly wheat (*Plantago*), and chia (*Salvia*), may well have been encouraged or cultivated during the Prehispanic era (Bohrer 1991, 232) even as groups were incorporating the late summer and fall-ripening Mesoamerican imports into their diets.

A general lack of historical interest in little barley grass may be in part because relatively early in the historical period, Old World domesticated grasses such as wheat (*Triticum* spp.) and barley (*Hordeum vulgare*) provided critical cool-season harvests. Domesticated Old World wheat was carried by Oñate into New Mexico in 1595 AD (Dunmire 2004, 164-68), and by the mid-1600s AD both wheat and Old World barley (*Hordeum vulgare* L.) had entered Arizona (Dunmire 2004, 219). It seems that even before these Old World domesticates became available to New World groups, interest in indigenous *Hordeum pusillum* had waned.

The ethnographic record contains no evidence that little barley was either gathered or planted during the historic period. In the American Southwest, little barley, once an important Prehispanic dietary resource, passed from human interest over six centuries ago.

As a cool-season grass that matures in the springtime, little barley is one of a number of grasses that can be harvested during a normally food stressed time of year. It contrasts with the major domesticates from Mesoamerica, such as maize, squash, and beans, which are all warm-season annuals that ripen in the late summer through fall seasons. Any indigenous plant that could be managed to produce a crop in the spring would be especially valuable. Some of the first cool-season crops from the Old World to find a home in New Mexico and Arizona were species of wheat (*Triticum*) and barley (*Hordeum*), presumably because they produced food earlier than most already established crops,

Historic groups often broadcast grass grains of river banks in receding winter snowmelt floods or broadcast seeds in nonriverine areas. Equally likely, groups may have used irrigation waters to speed development of a little barley crop. In some cases, it is clear that little barley was dryland farmed in upland situations, reliant only on natural winter/spring precipitation. The recovery of little barley evidence in residential contexts associated with food processing, cooking, consumption, and discard implies that they were prepared and consumed like many other wild and domesticated foods. In terms of nutritional content, they are assumed to be similar to other domesticated grains in the grass family, providing a significant component of carbohydrates to the diet, as well as lesser amounts of protein, calories, fiber, fat, and other dietary constituents.