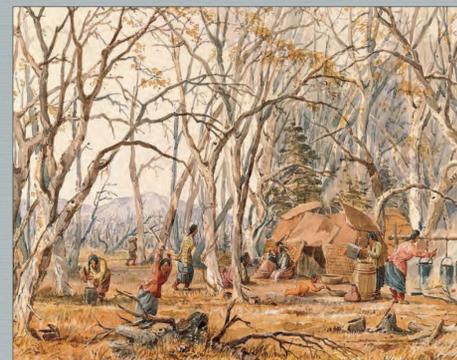


# A STORY IN SEEDS



## The Archaeological Study of Ancient Plants

The remnants of plants tell archaeologists many stories. They can tell us how old a site is, if ancient peoples grew crops, and what they had for supper. When European explorers first encountered aboriginal peoples, they described plants used for food, medicines, decoration, ceremonies, clothing, and tools. Anthropologists in the late nineteenth century began to assemble these accounts and made observations of their own regarding plant use among native peoples. So began the science of ethnobotany, blending anthropology and botany to study the relationship between plants and people.

Most plant remains do not survive long in the ground. Archaeologists first began paying attention to plant remains when intact and familiar plants were found in very wet or very dry environments associated with places occupied thousands of years ago. In Switzerland, waterlogged village sites built on lake edges yielded nets, cloth, wooden dishes, dried fruits, and seeds. In the deserts of the American Southwest, woven baskets and sandals were found in caves and piles of sticks and corn cobs were lying on the ground in long-abandoned Puebloan cities. The study of ancient plant use is called paleoethnobotany in America and archaeobotany in Europe.

In the 1960s, a new archaeological recovery technique called flotation began to be employed at sites. Dirt from excavation units was placed in water and the water passed through fine-mesh screens. The screens yielded bits of carbonized seeds and wood called macrofossils. Wood charcoal was used for radiocarbon dating to determine the age of the site. The seeds were examined to help reconstruct ancient plant use. In the 1970s, flotation began to be employed on large-scale excavations required by new federal environmental laws. The science of paleoethnobotany rapidly became more widespread and more specialized. The appearance of accelerator mass spectrometry (AMS) radiocarbon dating in the 1990s allowed us to date very small samples including some individual seeds.

Paleoethnobotany is more than just the study of ancient seeds. It includes other food plants like nuts, legumes (e.g., beans), and tubers (e.g., prairie turnip). It includes identifying types of trees based on wood charcoal and what was put in ancient stew pots by microscopically examining charred crusts for plant-specific starches and phytoliths (microfossils). Paleoecological reconstructions of past environments are vital to understanding past lifeways, so studies of pollen, plant macrofossils, and diatoms in lake sediment cores are also very important to archaeology. Principally due to University of Minnesota geologist Herb Wright, Minnesota is a world leader in paleoecological studies.



## What Plant Remains Can Tell Us

The history of plant domestication was an early focus of paleoethnobotany, with the spread of maize (corn) horticulture very important in the Americas. Charred corn cobs and relatively large corn seeds were recovered from prehistoric archaeological contexts prior to the use of flotation. Corn was often grown with beans because corn lacks a vital amino acid (tryptophan) that beans have in abundance. If a diet has a high reliance on corn without a good source of tryptophan, the disease known as pellagra can cause major health issues. Maize originated in Mexico, while beans probably came from South America.

The first domesticated plants in the Midwest were not imported tropical plants, but seed-rich local weeds like goosefoot (chenopodium) and pigweed (amaranth). The small charred seeds from these plants were abundant in initial flotation samples from some archaeological sites so their importance is a relatively recent discovery. Squash was also an early domesticate. The first squash varieties used in the Midwest were probably derived from a North American wild plant, although later varieties of cucurbits (gourds, squashes) were imports from Mexico. The earliest squash seed dated in Minnesota is 2,600 years old from an archaeological site on the Mississippi River in Wabasha County.

In the northern Midwest, wild rice was a naturally occurring grain of critical importance to both prehistoric and early historic peoples. Wild rice was quite common throughout much of the northern two-thirds of Minnesota, although it needed very specific growing conditions – flowing and shallow water. While Indian groups could promote its spread and intensity through planting, most wild rice was naturally occurring. It provided an abundance of grain similar to domesticated crops. Wild rice is more nutritious than corn and is a storable food if it is carefully harvested, dried, and parched. The earliest wild rice use in Minnesota was probably several thousand years ago, although there is still some debate as to when intensification of wild rice use began. Its intensive use is clearly apparent by AD 1000.

Maple sugar is another Midwest plant-derived food requiring sophisticated technology to obtain and process. Its earliest use is also a matter of current debate. Metal tools and utensils obtained from Euro-American traders certainly changed the Indian technologies involved with both wild rice and maple sugar, with large cast iron kettles becoming essential to the processing of both foods.



## Ethnobotany and Paleoethnobotany in Minnesota

The two principal Indian groups in Minnesota are the Ojibwe (Chippewa) and the Dakota (Sioux). Both groups made extensive use of plants for things we now buy at grocery, hardware, clothing, and drug stores. Much has been written about Ojibwe ethnobotany (e.g., Densmore 1928; Reagan 1928; Smith 1932), but there is no comprehensive text on Dakota use of plants. Much information about Dakota ethnobotany can be found in the accounts of early explorers and missionaries (e.g., Pond 1908; Bray and Bray 1976). There has also been some archaeological discussion of plants important to the prehistoric and early historic Dakota, especially with respect to their seasonal subsistence patterns in various regions of Minnesota (e.g., Spector 1993:61-77; Johnson 1985; Whelan 1990; Anfinson 1986). There are historic paintings and drawings showing plant use by the Dakota and Ojibwe, most notably the works of Seth Eastman, some of which are featured on this poster.

The co-founder of the Department of Anthropology at the University of Minnesota in the early 1900s was Albert Jenks. Jenks had a degree in economics from the University of Wisconsin where his dissertation was entitled *The Wild Rice Gatherers of the Upper Lakes*. This was mainly an ethnographic study of Ojibwe wild rice customs. A half century later, another University of Minnesota faculty member, archaeologist Elden Johnson, recognized the importance of wild rice to the prehistoric Dakota when they lived in the northern half of Minnesota. Johnson designed a multi-disciplinary research program in the mid-1960s to study wild rice, which included intensive archaeological excavations at newly established Mille Lacs Kathio State Park. Wild rice grains were first archaeologically recovered from Late Prehistoric sites at Kathio in the mid-1970s. Tobacco, squash, and corn were also found at these sites.

While wild rice was the cereal grain of northern Minnesota Indians, it was corn in the south. In 1913, archaeologist William Nickerson found charred corn kernels in the bottom of a storage pit at the thousand year-old Cambria site west of Mankato. This corn was analyzed by the University of Michigan in 1950, one of the first paleoethnobotany studies done for Minnesota. Over the last century, prehistoric corn remains have been found by archaeologists at numerous southern Minnesota sites, in particular those sites associated with Late Prehistoric semi-sedentary villagers known as Oneota and Plains Village.



## Read More About:

### Paleoethnobotany

Marston, John, Jade Guedes, and Christina Waringer  
2015 *Method and Theory in Paleoethnobotany*.  
University Press of Colorado, Boulder.

Pearsall, Deborah  
2015 *Paleoethnobotany: A Handbook of Procedures* (3rd Edition).  
Left Coast Press

Raviele, Maria and William Lovis, editors  
2014 *Reassessing the Timing, Rate, and Adoption Trajectories of Domesticated Use in the Midwest and Great Lakes*.  
*Midwest Archaeological Conference Papers Number 1*.

### Minnesota Ethnobotany and Paleoethnobotany

Anfinson, Scott  
1986 Prehistoric Subsistence-Settlement Patterns in the Prairie Lake Region. In *Proceedings of the Ninth North American Prairie Conference*, Gary Clambey and Richard Pemble, editors.  
Tri-College University Center for Environmental Studies

Bray, Edmund and Martha Bray  
1976 *Joseph Nicollet on the Plains and the Prairies*.  
Minnesota Historical Society Press.

Densmore, Frances  
1928 *Uses of Plants by the Chippewa Indians*.  
*Bureau of American Ethnology Annual Report* 44:275-397

Jenks, Albert  
1900 *The Wild Rice Gatherers of the Upper Lakes*.  
*Annual Report of the Bureau of American Ethnology* 19:1013-1137

Johnson, Elden  
1969 Preliminary Notes on the Prehistoric Use of Wild Rice.  
*Science* 163:276-277.

1985 *The 17th Century Mdewakanton Subsistence Mode*.  
In *Archaeology, Ecology, and Ethnohistory of the Prairie Forest Border Zone in Minnesota and Manitoba*, Janet Spector and Elden Johnson, editors. J and L Reprints.

Perkl, Bradley  
1998 *Curcubita Pepo from King Coulee, Southeastern Minnesota*.  
*American Antiquity* 63(2):279-288

Pond, Samuel  
1908 *The Dakota or Sioux in Minnesota as They Were in 1834*.  
*Minnesota Historical Society Collections* 2:319-501

Reagan, Albert  
1928 *Plants Used by the Bois Forte Chippewa Indians of Minnesota*.  
*Wisconsin Archaeologist* 7:230-248

Schaaf, Jeanne  
1981 *A Method for Reliable and Quantifiable Sampling of Archaeological Features for Flotation*.  
*Midcontinental Journal of Archaeology* 6(2):219-248

Smith, Huron  
1932 *Ethnobotany of the Ojibwe Indians*.  
*Bulletin Milwaukee Public Museum* 4(3):327-525

Spector, Janet  
1993 *What This Aul Means*.  
Minnesota Historical Society Press.

Whelan, Mary  
1990 *Late Woodland Subsistence Systems and Settlement Size in the Mille Lacs Area*.  
In *The Woodland Tradition in the Great Lakes*, edited by Guy Gibbon. *University of Minnesota Publications in Anthropology Number 4*.

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