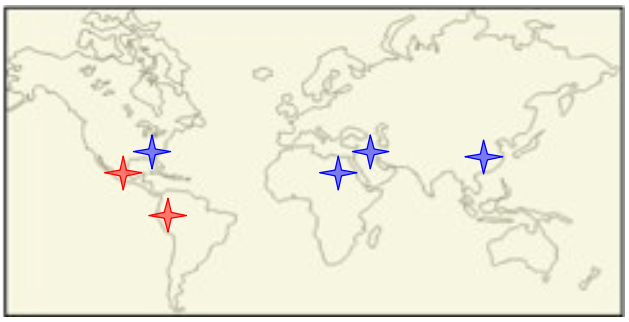
Beans and the Red River Gorge:
The Other Side of Plant Domestication

The places people first domesticated native plants are scattered all across the globe. Archaeologists call these places **hearths** of plant domestication.

The five most familiar hearths - Mexico (corn), Peru (potatoes), the Middle East (wheat and barley), Africa (soybeans and millet), and east Asia (rice) - are those where people first domesticated the foods we commonly eat today.



World hearths of plant domestication. Red stars indicate hearths of bean domestication.

A sixth, and less well-known, hearth is Eastern North America. More than 3,000 years ago, native groups domesticated eight weedy annuals. Called the **Eastern Agricultural Complex (EAC),** these plants produce nutritious seeds that are good sources of oils and fats (like sunflower) or starchy carbohydrates (like goosefoot). Sites in Kentucky's Red River Gorge contain some of the earliest and best-preserved evidence of plant domestication in this hearth.

The Other Side of Plant Domestication – The Common Bean

Photo Courtesy of Bill Best

Through a process called **diffusion**, domesticated plant cultivation can spread across long distances to places where the plant is not native. People share the seeds, as well as the knowledge needed to grow the plants and prepare the foods. Plants will thrive in a new environment if it meets the plant's growing requirements or if people can adjust the environment to meet the plant's needs. In this way, people may continue to change and manipulate the plant, producing new varieties over time.

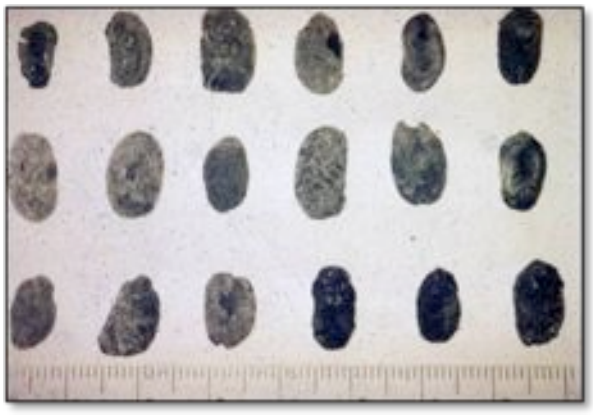
Several plants domesticated elsewhere came to prehistoric Kentucky through diffusion. One example is the common **bean** (*Phaseolus vulgaris*), pictured. It was independently domesticated in the Peruvian Andes around 4400 years ago and later in Mesoamerica around 2400 years ago (the red stars shown above). The thicket bean (*Phaseolus polystachios*) is the only *Phaseolus* bean native to North America. Although shaped like the common bean, it is smaller, and native peoples did not domesticate it. Wild beans (*Strophostyles helvola*) are a different species altogether.

Route Into Kentucky

Archaeologists are not exactly sure the route the domesticated bean took to get to Kentucky. It doesn't help that beans do not occur in large quantities at most archaeological sites and only burned or charred examples preserve well.

Some archaeologists think beans came from the American Southwest and across the Plains. Domesticated beans appeared about 2500 years ago in the Southwest. People living on the Plains adopted beans beginning in the late AD 1000s to the early AD 1100s. Other archaeologists think domesticated beans came from the Caribbean, across Florida and up the Atlantic coast, then east into Kentucky.

Native peoples in the Eastern Woodlands adopted beans quickly, for beans appear in sites all across the Midwest and the Northeast by the late AD 1200s. This is about the same time domesticated beans appear at Fort Ancient sites in central and northern Kentucky. The earliest Kentucky examples occur at the Guilfoil site in Fayette County and at Fox Farm in Mason County. Possible domesticated common beans recovered from the Muir site in Jessamine County have stirred up quite a controversy. They may date a century earlier than domesticated beans elsewhere in the Eastern Woodlands.



Prehistoric charred beans from the Fox Farm site.

Regardless of the path domesticated beans took on their way to prehistoric Kentucky, it is quite clear that beans were the last of the major cultivated plants to appear in the native plant food inventory. Squash had arrived thousands of years earlier and corn, hundreds of years before.

Growing Beans

In eastern and central Kentucky, native peoples had been farming since around A.D. 1000. The planting system they used – **intercropping**, or planting complementary crops together in the same field – was a sophisticated, sustainable, and productive agricultural system. It depended on the same kind of knowledge about crops and soil management as farming does today. Pairing a legume with a cereal grain is found in almost every agricultural community through time worldwide. In prehistoric eastern and central Kentucky, the legume was beans and the cereal grain was Eastern 8-Row flint corn. Include squash and you have what many Eastern North American native peoples still refer to as the "Three Sisters."

The "Three Sisters" (L-R): squash, corn, and beans

A Food and Ritual Plant

It is no wonder that prehistoric peoples quickly adopted beans as a crop and food. Beans replenish nitrogen in the soil, serving as a kind of natural fertilizer that makes other plants

grow better. Beans have the highest protein content of the vegetable kingdom, are a great source of fiber, and are rich in iron.

Lacking large domesticated animals as source of protein, native peoples in Kentucky had to depend on vegetable protein to meet their nutritional needs. Dishes that combine beans and corn are a good source of complete vegetable protein. Beans are high in protein and contain the vital amino acid lysine. Corn is high in calories but low in protein, and it lacks lysine, isoleucine and tryptophan. Processing corn with wood ash (lye) to produce hominy reduces some of its essential amino acids, but increases its lysine and (the B vitamin) niacin content.

Unlike some of the other plants they grew, Kentucky's native peoples did not use beans/bean pods as the raw material for containers (gourd) or masks, mats, and baskets (corn husks). However archaeologists have discovered that for centuries, shelled beans were part of native farming people's burial rituals. At sites in Mason County and Larkin County, charred beans and shelled corn found in graves suggests these items may have been offerings or eaten as part of mourning/burial ceremonies or feasting.

Beans in the Gorge

In central and eastern Kentucky between A.D. 1000 and 1750, Fort Ancient farmers lived in villages scattered across the uplands and along the major river valleys. Several village sites in central and northern Kentucky have produced beans.

Archaeologists have found little evidence, however, for Fort Ancient farming villages in the Red River Gorge. The Gorge at this time appears to have been a place where small groups of Fort Ancient people came to hunt. During the winter, they would stay in its many rockshelters. As yet, archaeologists have not found beans at Fort Ancient rockshelter sites in the Gorge.

Historic Beans and Heirloom Beans

In the historic period, European-Americans and their slaves learned about beans from indigenous groups. Some heirloom varieties gardeners grow in Eastern Kentucky today may be directly linked to the prehistoric bean varieties. An heirloom bean expert identified ***cut short*** beans in the collection of beans from the prehistoric Fox Farm site. Cut shorts are one of the dominant heirloom bean types grown in the Southern Appalachian Mountains today.

Mary Moore greasy, an heirloom variety from Jackson County, Kentucky (Bill Best photo).

There is a long tradition of saving and sharing beans in eastern Kentucky. Preachers, politicians, and peddlers passed out varieties of beans to woo votes and souls. As people migrated out of the mountains in search of jobs, they took their beans with them and traded for others.

Today, people grow hundreds of different heirloom bean varieties in the Southern Appalachians. Characteristics of bean biology mean that it is easy for Kentucky farmers to select the characteristics they like and want and keep varieties intact over many generations. In this way, they have developed scores of regional bean varieties with an incredible diversity in size, shape and color. Some varieties are linked to the families, communities, and regions in Kentucky where

they were first developed. For example, Turkey Craw beans are popular within a hundred-mile radius of Cumberland Gap. Partridge Head beans are grown in south-central Kentucky. Big John beans grow in gardens in Knott, Perry, Letcher and Harlan counties.

Today, the U.S. grows large quantities of beans, but these are mainly soybeans. The Midwest is the leader in growing table beans. These are mainly kidney, red, navy, Great Northern, black, and pinto or cranberry beans. With the return to basic simple foods, heirloom beans are making a comeback.

A favorite in Eastern Kentucky, the large white-seeded Big John is very tender (Bill Best photo).

Knowing "Beans About Beans"

The differences among green, string, and snap beans and dry or field beans are based on use and not on bean biology: all are the common bean (*Phaseolus vulgaris*). Pods of heirloom beans are edible, even when beans inside are mature. This contrasts sharply with commercial bean varieties that must be eaten when the pod and the seed are both immature, before the bean becomes too tough. Since many people today don't know "beans about beans," here's a quick reference guide:

- **fresh green beans** (common usage) - fresh green pod, immature beans in immature pod, picked off the plant, eat pod and beans; tough and inedible when mature
- **full green beans** (fresh green beans, heirloom usage) - fresh green pod, tender pod when mature, mature beans in the pod, picked off the plant, eat pod and beans
- **shuck beans** - mature beans in the pod, pick off the plant, remove the strings, break the pod into pieces, dry the pod, rehydrate, eat pod and beans
- **shelly beans** - beans mature in the pod, beans removed from the pod before the pod is dry, eat the fresh mature beans
- **dried beans** - beans mature in the pod, beans removed from the pod, dried, rehydrate, then eat the mature beans

Beans, The Wonder Food

People often associate dried (not green) beans with poverty and rustic living. This seems odd, since beans are so nutritionally rich. They are practically indestructible if thoroughly dried and well stored, providing insurance against famine. They are simple to grow. Beans are a cheap and economically efficient way to meet nutritional needs. Beans, lowly but nutritious, are the best source of vegetable protein. They are a way to feed the world without destroying the planet.