How is food production shaped by traditional knowledge?

Traditional knowledge and practices typically come from direct interactions that people have had with their local environments. Traditional knowledge is built over time, and often informed by trial and error and experience. This includes the practices used to grow, gather and hunt for food. Agriculture today has been influenced by these practices.

traditional food systems

Indigenous peoples use knowledge of their environments and traditional food systems to survive off the land. Traditional food systems were and are central to ways of life, health and well-being. The concept of a traditional food system includes all the food species — plant and animal life — that are available from local natural resources and the ways that those species are used.

Consider the examples shared in the article excerpts and photos that follow to think about the connections between food and farming in the past and food and farming today.

Traditional foods

Thousands of years ago, a rich variety of native plants dominated the North American landscape. Indigenous people cultivated a range of these plants that were an essential part of traditional diets, such as erect knotwood, goosefoot and marsh elder.

However, as the land was colonized and farmlands were established, some of the traditional knowledge of plant diversity has been lost.

Scientists and food activists are working to learn more about the ancient crops cultivated and eaten in different parts of the continent.

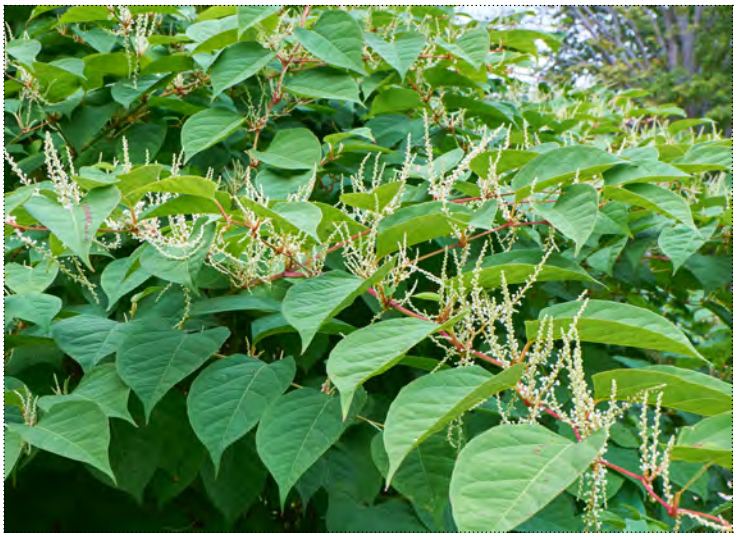
The photo shows an example of one of the traditional foods harvested by Indigenous people - silver weed (Tlik'sim). Other foods include red clover root (tak'sus), rice root (lak'sim) and lupine (Kwa'ni). The photos on the next page show knotwood and lupine, among the traditional plants harvested by Kim Recalma-Clutesi (Ogwiloqwa) of the Kwalikum First Nation on the coast of British Columbia.

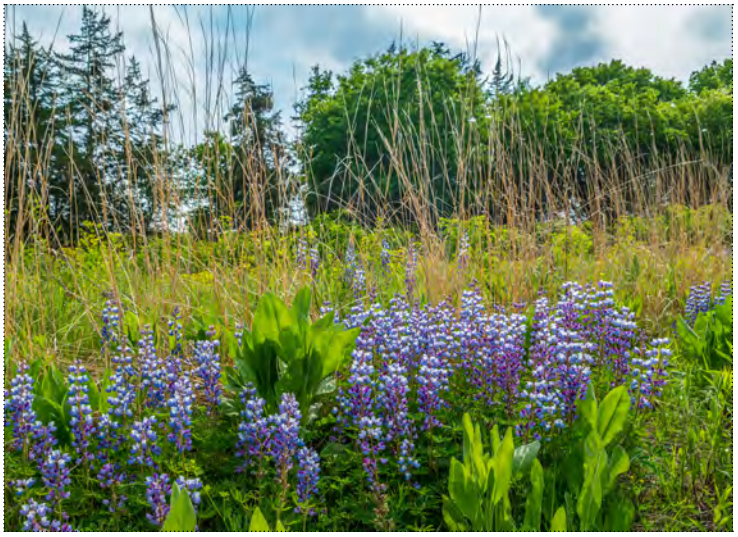
Preserving knowledge nearly lost

Not all Indigenous knowledge of local food and its preparation has been lost, of course — though in some cases, it was a very close thing. In the Kwalikum First Nation on the coast of British Columbia, for example, Kim Recalma-Clutesi (Ogwiloqwa) is an apprentice of sorts — a keeper of knowledge of ancient crop harvesting practices. She is also the caretaker of Clan Chief Adam Dick (Kwaxsistalla) and is trying to gather and preserve the knowledge of local food sources, harvesting, and preparation that only he possesses — while there is still time.

Dick is 89 years old, and the last traditionally trained elder in the art of Indigenous agriculture in his community. Knowledge like he has was nearly lost forever. When he was a child, his contemporaries were snatched up by the residential school system, and so the communication of knowledge from elders to youth was mostly broken with his generation. It was only because he was hidden from the residential schools that he got the chance to acquire and carry on the traditional knowledge of the ancient crops. And for most of his life, disruption of his community meant there was no-one to pass that knowledge on to.

Recalma-Clustesi is now doing her best to take on all the knowledge of environmental stewardship, nutritional diversity and food preparation that her clan practised for generations. It's no easy task, as the breadth of knowledge, the skill required, and the understanding of the ecosystem takes a lifetime to master.



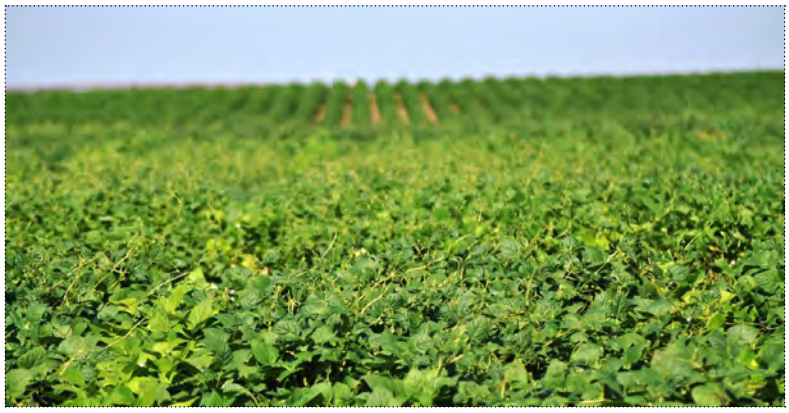


How does traditional knowledge – or knowledge from the past – benefit the practices used today to produce food? Describe one example that has the most meaning to you.

Photos and article excerpts from Quirks & Quarks (March 29, 2018). On a hunt for North America's indigenous crops. CBC Radio: Online. www.cbc.ca/radio/quirks/march-31-2018-a-new-human-internal-organ-tolerating-extreme-cold-volcanic-christianity-and-more-1.4596767/on-a-hunt-for-north-america-s-indigenous-crops-1.4596803

pulses as traditional plants

What's a pulse? The word "pulse" comes from the Latin word *puls*, meaning potage or thick soup. **Pulses** are the dry edible seeds of pod plants in the legume family. Pulses include dry peas, beans, lentils and chickpeas. Pulses are unique among grain crops in their ability to partner with certain soil bacteria to take nitrogen, an essential plant nutrient, from the air and turn it into a form that can be used by plants.



There has been historical evidence found that corns, beans, squash and sunflowers were grown in what is now Manitoba. These three plants were planted close together so that the beans could climb up the corn stalks. The squash helped limit weeds.

This practice of growing the three plants together improved the fertility of the soil. Sunflowers were often grown along the edges of fields planted by Indigenous people.

Today, Canadian farmers continue to grow pulses, including beans, lentils, peas and chickpeas. Pulse crops are often grown with other types of crops. Dry beans are rotated often with cereal crops, such as wheat and barley, oilseeds and sugar beets in Alberta.

Applying traditional practices

Pulse farmers in Alberta today apply many of the same general practices that Indigenous farmers used to grow plants for food.

Kelisha Archer farms with her husband Thomas, her parents Neil and Lonna Bertsch, and sister and brother-in-law Kaitlyn and Landon Hill near Drumheller. They grow a rotation of cereals, canola and yellow field peas on about 4500 acres. Pulses have been included in their crop rotation for the last decade to help stretch out the rotation and ease disease pressure in all their crops.

Peter Konstapel lives and farms near Spirit River with his brother and parents. They started growing yellow peas about nine years ago because they fit well into the rotation and it is convenient to harvest them early. Konstapel and his family grow peas, canola, wheat, barley and oats and have experimented with lentils. Peter says that including peas in the rotation helps to spread the workload.

connecting the past to the present

In a number of Indigenous communities, corn, squash and bean are called the "Three Sisters." When planted side by side, these three crops help each other during growth. Think about how these stories show how traditional farming practices in the past are still relevant today.

Research scientists at Agriculture and Agri-Food Canada (AAFC) and members of Indigenous communities worked together to better understand the Three Sisters model and why it was so successful. The project grew crops from seeds that were bought or provided by Indigenous team members.

Ancestral seeds are a scarce resource. In Indigenous communities, **seed keepers** are responsible for saving seeds after each harvest for future use. Seed keepers protect valuable plant diversity. These plants are also valuable because they can be grown in the Canadian climate.

The crops were grown to provide Indigenous communities with food and business opportunities that are connected to their traditions. The crops also provided a way to preserve biodiversity on cropland. The Three Sisters project had three themes:

- Preserving seeds and protecting Indigenous rights and knowledge
- Cultivating the Three Sisters in the Indigenous manner and describing their benefits
- Evaluating the food potential of the Three Sisters

One of the cooking processes used was the nixtamalization of corn. Among Indigenous communities, this is an ancient culinary tradition. The **nixtamalization process** consists of soaking and cooking corn kernels in an alkaline solution made with wood ash. This removes the outer hull of the corn kernels. It improves their nutritional vale and makes them easier to use in cooking. Nixtamalized corn kernels can be used to prepare a traditional soup or dried and ground into flour for making boiled bread.

Adapted from Agriculture and Agri-Food Canada (August 6, 2021). The Three Sisters: Optimizing the value and food potential of an ancestral indigenous crop system. Government of Canada: https://agriculture.canada.ca/en/news-agriculture-and-agri-food-canada/scientific-achievements-agriculture/three-sisters-optimizing-value-and-food-potential-ancestral-indigenous-crop-system

Quotation from Revitalizing Indigenous Culture, One Meal at a Time. Destination Indigenous: Online. https://indigenouscuisine.ca/food-culture/

What connections can you make between the way pulse crops are grown today with the practices shared in these stories of the Three Sisters?

The tradition of the Three Sisters

Traditional Indigenous food was primarily cultivated, harvested and consumed based on values of interdependency, respect for the environment, and ecological sensibility. For example, the Haudenosaunee cultivated "Three Sister" crops side by side to facilitate interdependent growth.

These sisters — beans, corn and squash — are very different, but rely on one another for nutrients and protection. Beans absorb nitrogen from the air to keep the other sisters healthy. Corn grows tall stalks for the beans to climb, wrapping the plants together. Squash grows wide, ground-covering leaves that keep the ground moist and weeds at bay.

What the story of the Three Sisters teaches us about farming

"It's not just the myth; these three vegetables have actually been proven to help each other grow to their maximum productivity better than if you were to plant them all individually," says Chef Bill Alexander, the new executive chef and culinary curator at Caldwell First Nation. "The fact that the sisters were provided together means that they're stronger together than they ever would be separate... the lesson, besides one of gratitude, is an appreciation and respect for the gardening technique," Alexander says. The Three Sisters story also highlights the importance of preserving Indigenous teachings and cultural practices that date back thousands of years.

Globe Content Studio (October 15, 2020). What the story of the Three Sisters teaches us about farming. Globe & Mail: Online. www.theglobeandmail.com/life/adv/article-what-the-story-of-the-three-sisters-teaches-us-about-farming/

Use examples from these stories to explain what you think is involved in the practice of crop rotation. Do you think this should be considered a traditional food production practice? Why do you think this?

Evidence of traditional Alberta plants

At an archaeological site on the west side of Calgary, residue recovered from grinding tools provided evidence of people processing native plants, including Saskatoon, chokecherry, native grasses, possibly prairie turnip and maize.

...Another 176 archaeological sites across western and central Canada were looked at for evidence of plant use. Maize, beans and squash were sometimes found in combination, with higher amounts of wild rice in areas with fewer beans. The preference for wild rice in the southern boreal forest, as opposed to bean, could be a result of cultural and/or environmental factors, and squash was rare across the [sites].

...Evidence of plant use by First Nations is also present in written accounts and observations. Some of the native plants that people used included strawberries, wild onions, tubers, roots, gooseberries, wild currants, saskatoons, chokecherries, buffaloberry, raspberry, bearberry and roots such as wild carrot and wintergreen. First Nations in the Cypress Hills of southeastern Alberta used a wide variety of native plants.

Historic Resources Management Branch (July 12, 2017). Early Plant Use in Alberta. Alberta, Culture, Multiculturalism and Status of Women: Online. https://albertashistoricplaces.com/2017/07/12/early-plant-use-in-alberta/ Photo: Glenbow Archives, NA-667-343