



# Seeds of Diversity Canada

## What is Genetic Diversity?

Genetic diversity is the natural variation that makes differences in plants and animals. Just like people, every plant and every animal is a little bit different from the others of its kind.

Diversity is important. It makes living things adaptable. It allows wild and domesticated species to withstand threats like diseases, climate changes, pests, and other unpredictable conditions. With enough variation in a group, there will always be some individuals that are naturally suited to survive and can thrive under any changing situation.

Diversity in plants also gives us a “treasure chest” of options for raising the healthiest and most productive crops. No matter what changes happen in our food system, we will always be able to adapt if we have enough genetic diversity.



### Why do we need genetic diversity in our food system?

Throughout the world, people rely on cultivated plants for their food. Even food that comes from animals – meat, milk, and eggs – depends on cultivated plants for the animals to eat. But in Canada, and worldwide, the food system is constantly changing. We need diversity to meet these changes.

**Changing tastes** People don't eat the same foods they used to. For instance, broccoli, one of the most popular vegetables today, was nearly unknown on Canadian dinner plates only 50 years ago. Zucchini only became popular about 30 years ago. Garlic used to be a marginal crop, but since 1990 its use in Canada has grown over 10 times. We need diversity to make these, and many more “new” foods available and productive in Canadian gardens and farms.

**New products** Many processed food products require specific qualities in their ingredients. For example, frozen dough products can be made only from wheat with a characteristic protein. Good-quality frozen french fries can be made only from potatoes with the right texture and moisture content. A generation ago, these characteristics didn't matter. We're lucky that people kept growing the varieties that had these qualities, so their uses could be discovered. What other undiscovered uses are in “old” varieties? We won't find out if we don't keep them growing.

**Greater awareness of nutrition** Every time a nutritional discovery is made, consumers change their eating habits, and food suppliers have to change what they provide. For instance, when nutritionists learned of the benefits of Omega-3, plant breeders scrambled to measure the content of that nutrient in different varieties of flax seeds; fortunately, some older varieties still exist that have high levels of Omega-3. And a recent study found that older vegetable varieties tend to have more vitamins than modern varieties.(1) This is probably because the newer varieties were bred for size and yield, not for nutritional content. Fortunately, some of these more nutritious older varieties are still available.

**Changing growing conditions** The climate is changing. New patterns of pests and plant diseases are constantly emerging. Pollution, acid rain, and ozone depletion are having measurable effects on plant growth. These and other factors are making it difficult for Canadian gardeners and farmers to grow the plants they depended on a decade ago. Can even older plants save us? Yes – diversity allows us to take advantage of a wide range of characteristics to find the plants that meet our current needs, even if those plants have been around for a long time. Many older varieties are rugged and tough, able to withstand the challenges of change. It isn't a question of age: it's a matter of variation and adaptability.

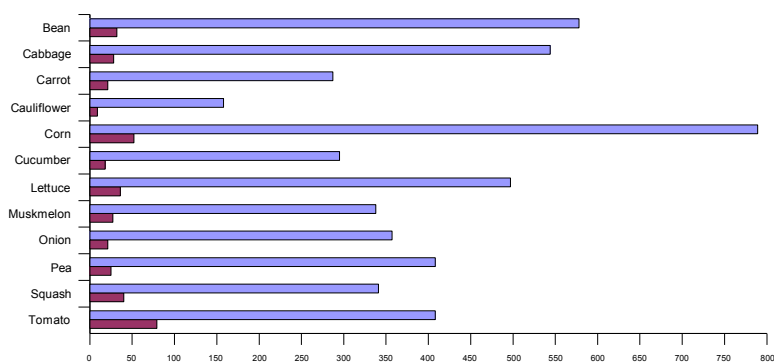
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#### So What's the Problem?

The problem is that plant genetic diversity is disappearing fast. Like the erosion of a building's foundation, this “genetic erosion” threatens to destroy the system of food and farming that has been built on plant genetics for over 10,000 years.

There are still thousands of varieties left to choose from, but the vast majority of them are endangered. Hundreds become extinct every year. The losses during the past 100 years are staggering.



Varieties of vegetables listed a century ago, and the number of those that still exist.

The Food and Agriculture Organization of the United Nations (FAO) estimates that since the beginning of the 20<sup>th</sup> century, about **75% of the genetic diversity of agricultural crops has been lost** worldwide. (2)

Of 7,098 apple varieties documented as having been in use between 1804 and 1904, about 86% have been lost. Similarly, 95% of the cabbage, 91% of the field corn, 94% of the pea, and 81% of the tomato varieties apparently no longer exist. (3)

All of our cultivated plants depend on human care. They don't grow in the wild, only in gardens and farms. That means if nobody grows a particular variety and saves its seeds, that variety becomes extinct forever.

A century ago, millions of seed-saving gardeners and farmers kept our plant varieties alive. They maintained thousands of “heritage” or “heirloom” varieties as a normal part of traditional agricultural practice. But in modern times, people stopped saving their own seeds, leaving the job up to seed companies and gene banks. Unfortunately, there are only about 250 seed companies in North America, and only a handful of people working at government gene banks. The work of millions of ordinary people just can't be done by a relatively small number of professionals, however skilled and well-equipped they may be.

## **We need gardeners to save seeds again!**

**Support Seeds of Diversity – Support gardeners conserving endangered plants**

**[www.seeds.ca](http://www.seeds.ca)**

1. Donald R. Davis, PhD, FACN, Melvin D. Epp, PhD and Hugh D. Riordan, MD, *Changes in USDA Food Composition Data for 43 Garden Crops, 1950 to 1999*. Journal of the American College of Nutrition, December 2004.

2. Sustainable Development Department, Food and Agriculture Organization (FAO). *Biodiversity for Food and Agriculture: Crop Genetic Resources*. FAO, United Nations. February 1998.

3. *Report on the State of the World's Plant Genetic Resources for Food and Agriculture*, FAO, United Nations. 1996. p 14. (based on information from Fowler C (1994) *Unnatural selection: technology, politics and plant evolution*. Gordon and Breach Science Publishers, Yverdon, Switzerland.)