

Origins, transformation, and the future of our food crops

10:00 AM-12:00 PM, June 4, 11, 18, and 25; July 2 and 9, 2024

Course summary

Instructor

The food crops upon which we are so dependent each have their own, often winding evolutionary stories. Starting with wild or weedy plants, humans gather, cultivate, domesticate, and modify crop plants to feed and enrich their cultures. Understanding this depends on knowledge of plants and their interactions with the environment as well as an appreciation of the complexities of human behavior and social interactions.

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In this course we explore the evolution of food crops focusing on three main questions:

- Where do our food crops originate?
- Why and how have humans used and changed these crops?
- How may crops continue to evolve to address future challenges we confront?

We will review domestication and the origins of agriculture, which occurred independently in many areas around the world and for a variety of reasons. From there we will consider why and how humans alter their crop plants to better suit their needs. Much of this involves what we now know as “plant breeding,” although this was a field of science unknown to most of its practitioners who drove early crop evolution. Finally, we will address how food crops and humans are evolving in response to a rapidly changing climate.

Topics – *Questions addressed*

Background reading*/*Activities***

Week 1 (June)

1. Course overview and introduction to the instructor – *Who is the instructor? What will we learn about? How will the course work?*

[Where our food crops come from.](#)
International Center for Tropical Agriculture.

2. Plants and foods – *What do we eat? What is a food crop? Where do our foods come from and how is this changing?*

Weeks 2 & 3 (June 11 & 18)

*Experiencing food crop diversity:
Tasting new things*

3. Evolution in wild plants: The engine that drives diversity – *What processes are responsible for the diversity in our crops? How do these processes function?*

[Forces of Evolution](#). Shook, B., Nelson, K., Aguilera, K., & Braff, L. (2019). *Explorations*

4. Gathering, managing, and (sometimes) domesticating plants: The Neolithic Revolution – *Why not just keep hunting and gathering wild plants? What happens when we sow and harvest wild plants? Is this good for us? What about the plants? Does it matter what part of the plant we're using?*

Threshing wheat using neolithic tools

Weeks 5 & 6 (July 2 & 9)

5. The emergence of agriculture, and eventually, plant breeding – *How have agriculture and farmers modified our crops? What is plant breeding and what does it aim to do? What was the Green Revolution? What are hybrid varieties, "heirloom varieties," and genetically modified organisms, and why should we care?*

[When Did Humans Start Settling Down?](#) *Smithsonian Magazine*, July/August, 2023.

6. Crop case studies – *What can we learn about the origins and improvement of plants that are common in our diets such as corn, banana, potato, rice, avocado, olive, tomato, sunflower, the cole crops (broccoli, cabbage, cauliflower, etc.), and lettuce?*

Heirloom varieties and taste tasting

7. The future of food crops – *Is crop domestication still occurring? How do wild plants affect the improvement of our crops? What crop improvement tools are being used today?*

[Meet the Climate-Defying Fruits and Vegetables in Your Future](#). *New York Times*, Sept. 25, 2023.

* **Background readings are not required.** Students who are particularly interested in additional background may want to use these references – via electronic copies or on-line links, which will be made available – to delve deeper into the lecture topics. Lectures will be loosely based on content in these source materials.

***Activities will involve experiments, demonstrations, or displays.*

Additional references related to this topic that you may find interesting. (This list will grow by the time our course begins):

Abbo, S., Gopher, A., & Bar-Gal, G. K. (2022). *The origins of agriculture in the ancient near East*. Cambridge University Press. (Scholarly coverage of the social, cultural, and biological aspects of agricultural origins.)

Alexander, A. (2022). *The Seed Detective: Uncovering the Secret Histories of Remarkable Vegetables*. Chelsea Green Publishing. (A personal story of travel, and seed collecting and saving by a noted British gardener.)

Alexander, W. (2022). *Ten Tomatoes that Changed the World*. Grand Central Publishing. (A very informative and fun story of this vegetable's interesting introduction and improvement history.)

Ashworth, S. (2002). *Seed to seed: Seed saving and growing techniques for vegetable gardeners*. Chelsea Green Publishing. (The classic reference for gardeners interested in seed saving, and perhaps, plant breeding.)

Bray, F., Hahn, B., Lourdasamy, J. B., & Saraiva, T. (2023). *Moving Crops and the Scales of History*. Yale University Press. (A scholarly presentation of agricultural geography. Emphasis on the movement of crops but also the social forces behind this.)

Nabhan, G. P. (2016). *Enduring seeds: Native American agriculture and wild plant conservation*. University of Arizona Press. (Lots of interesting stories of indigenous peoples' use of plants.)

Saladino, Dan. (2022). *Eating to Extinction: The World's Rarest Foods and Why We Need to Save Them*. Macmillan Publishers. (The focus here is on rare foods – both plant and animal based – and considers how Western food systems may be threatened by a lack of diversity.)

Siegel, Matt. (2022). *The Secret History of Food: Strange but True Stories About the Origins of Everything we Eat*. Harper Collins Publishers. (Lots of odd things that you didn't know about food. A fun read.)

Soleri, D., Cleveland, D. A., & Smith, S. E. (2019). *Food gardens for a changing world*. CABI. (Written mostly by Daniela Soleri and David Cleveland that talks about food gardens, plant breeding, and the future.)

Stalker, H. T., Warburton, M. L., & Harlan, J. R. (2021). *Harlan's Crops and Man: People, Plants and Their Domestication* (Vol. 186). John Wiley & Sons. (An updated version of Jack Harlan's classic 1975 volume on crop domestication.)

Weaver, William Woys. (2000). *100 Vegetables and Where They Came From*. Algonquin Books of Chapel Hill. (Interesting origin stories for 100 varieties of vegetables.)