

Food Chains, Food Webs, and Plant Guilds

By Kate O'Lenic, Master Gardener. Originally published in the Johnson City Press and adapted with permission for use by the Appalachian Habitat Alliance

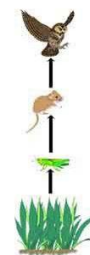
Here's a bit of food for thought - all our food starts with energy from the sun. Sun makes the plants grow, the plants are eaten by insects or animals, which in turn are food for other creatures, including us. That leads us to the idea of food chains and food webs. A food chain is a very simple description of how this transfer of energy occurs. There are food chains in the ground, in streams, rivers, and oceans, in deserts and forests - well, everywhere, including our yards and gardens. Those food chains overlap and blend together into food webs. As gardeners, we can help food chains and webs thrive by what we plant. That's pretty amazing.

Let's start at the ground level. There is a huge living food web in the soil. The bacteria, fungi, ants, worms, beetles, and more in the soil are important for soil health. To support them, consider the following:

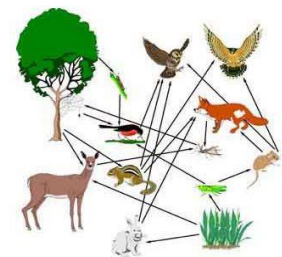
- Avoid tilling the soil.
- Restore compacted soil.
- Use organic mulch, such as tree branches and leaves.
- Avoid the use of pesticides.
- Use a variety of plants for a wide food source for those that feed on the plants.
- Leave lawn clippings in place.
- "Leave the leaves" - let leaves pile up in your gardens.

Food Chain vs. Food Web

FOOD CHAIN
(just one path of energy)



FOOD WEB
(everything is connected!)

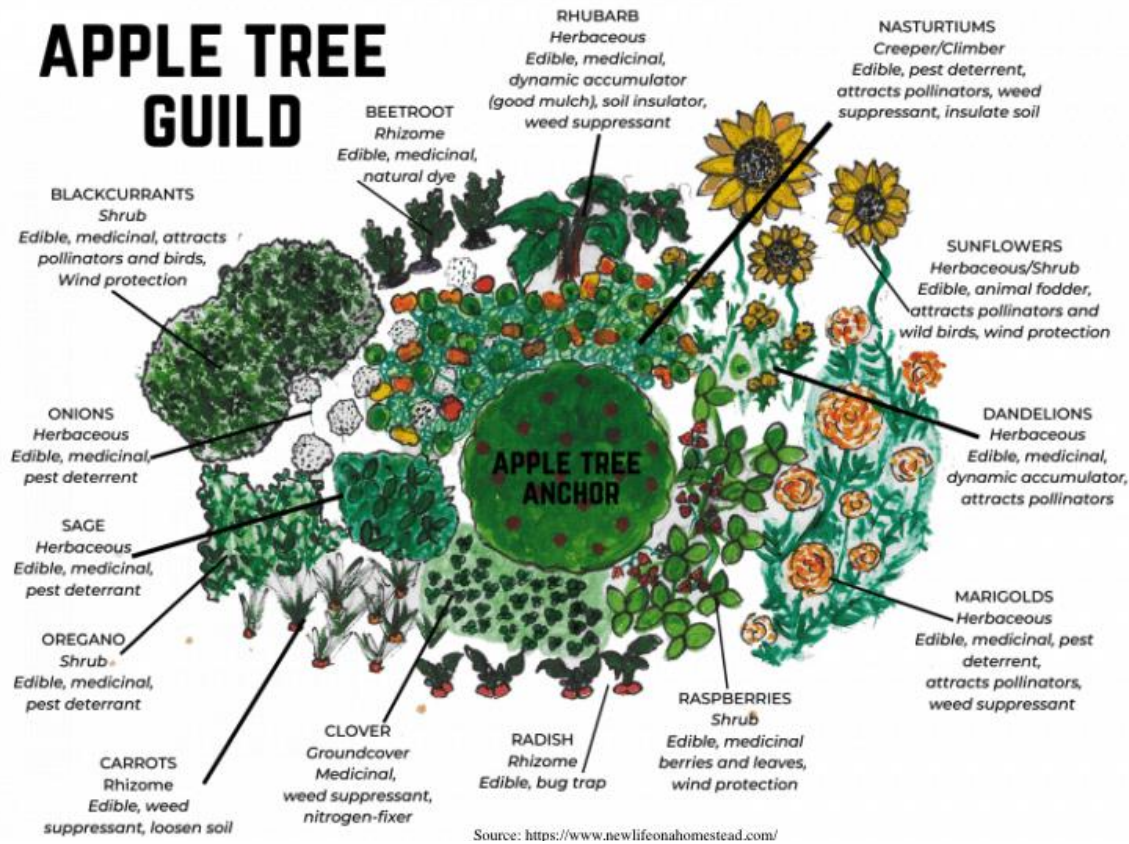


Wild Bergamot Photo by Christy Shivell

It will come as no surprise that native plants are essential for a healthy food web. Even better, keystone plants are the "powerhouse plants" that provide the most support for food webs. For recommendations on keystone plants and other native plants for your gardens, consult with native plant groups, search the internet for native plants for your area, or find nurseries in your area that specialize in native plants.

The State of Tennessee has published "Landscaping with Native Plants" available at: https://www.tn.gov/content/dam/tn/tdot/environmental/redesign/hbo-pollinator-program/pdfs/ref_residential_landscaping_native_plants_tennessee.pdf. There is also a publication from the University of Tennessee entitled "Native Trees for Tennessee" that can be a good starting point for gardeners to find the right plants to nurture nature. (<https://extension.tennessee.edu/publications/Documents/SP515.pdf>)

There's one other concept to digest - plant guilds. Plant guilds are collections of diverse plantings that support each other. Guilds are intended to attract beneficial insects, repel pests, and improve soil nutrition and use of water and nutrients. The idea is based on companion planting for vegetable gardens but also involves trees and shrubs. As an example for home gardeners, plant guilds can be designed around fruit trees using flowering and vegetable plants.



Golden Alexanders, an excellent native attractor plant.
Photo by Christy Shivell

Partner plants for guilds fall into six categories: accumulator, attractor, fixer, suppressor, deterrent, and mulcher. Accumulators are plants that add nutrients to the soil and include comfrey (potassium) and red clover (iron). Attractors are plants that draw beneficial insects to the garden and include marigolds, sunflowers, nasturtiums, and many more. Fixers are plants that fix nitrogen in the soil, such as peas, beans, and clover. Suppressors like nasturtiums, rhubarb, and clover help inhibit weed growth. Deterrents help repel pests; planting onions, sage, oregano, marigolds, and other strongly fragrant plants will aid in repelling garden pests. Finally, mulchers, as the term suggests, help to retain soil moisture and inhibit weed growth. Nasturtiums and rhubarb are



Aromatic Aster deters pests and attracts beneficial insects. Photo by Christy Shivell



Canada Anemone and Bracken Fern are excellent native suppressors and mulchers. Photo by Christy Shivell

good examples of mulchers. When creating your plant guild, consider using plants that cover several different categories and include providing fruit and vegetables you can eat. There is so much we gardeners can learn about different ways to plant and reap the benefits that nature offers. How about starting your own guild? Resources below provide all the details you'll need to get started.

Resources

Introduction to and Components of Food Webs

https://bio.libretexts.org/Courses/Gettysburg_College/01%3A_Ecology_for_All/19%3A_Food_Webs/19.01%3A_Introduction_to_and_Components_of_Food_Webs

Food Chains and Food Webs

<https://www.epa.gov/sites/default/files/documents/foodchainsandfoodwebs.pdf>

Support the Soil Food Web

<https://landscapeforlife.colostate.edu/support-the-soil-food-web/>

Powerhouse Plants

<https://www.udel.edu/udaily/2020/december/doug-tallamy-native-plants-food-web-insects-birds-survival-earth/#>

Edible Forest at James Madison University - Plant Guilds

<https://sites.lib.jmu.edu/foodforest/sample-guilds/>

Companion Planting in Home Gardens

<https://extension.umn.edu/planting-and-growing-guides/companion-planting-home-gardens>

Companion Planting

<https://extension.wvu.edu/lawn-gardening-pests/gardening/garden-management/companion-planting>

New Findings Further the Study of Dynamic Accumulators

<https://smallfarms.cornell.edu/2022/04/new-findings-further-the-study-of-dynamic-accumulators/>

How do I ask a question?

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