2017 ACORN Conference & Trade Show
Best Western Glengarry, Truro, NS

Workshop Title: Introduction to Permaculture and Farm Ecosystem Services

Speaker: Zach Loeks, market gardener, farm consultant, educator, and author of The Permaculture Market Garden.

Executive Summary: Zach shares insights and examples of how to understand and value ecosystem services to create a profitable and resilient garden.

Notes:

We first need to understand natural systems to value and understand ecosystem services on a farm and to manage the land. Natural systems include things like the atmosphere, hydrosphere, geosphere, pedosphere, and biosphere. Natural systems have form and function, for example a forest garden with roots, branches, shade, fruits, etc. Ecosystem services are what give us everything we have, such as lumber, food, and the purification of air and water. A farm is an ecosystem too. Permaculture is mimicry of ecosystems for human systems. Ecosystem services need to not just be understood, but also valued.

Example: Soil.
Soil is 45% mineral, 25% air, 25% water (the water and air account for 50% pore space needed in soil), and 5% organic matter. Without this make-up, it's not soil, just dirt. Soil also needs life in it. Holistic soil also has an associated ecosystem ex: the forest above. Understanding all this, one way to value and protect soil is through cover crop planting and mulching for winter. Soil life needs habitat and so these practices actively support soil ecosystem services.

As another example, we often just think about the edible part of a crop as being the service that crop provides. But crops have full life cycles with different features, as well as hidden services. We need to learn about and appreciate all the steps and parts. As an experiment, try leaving some crops and observing them to find out what hidden services they might yield. Ex: squash produces an edible part but can be planted as a cover crop. Lettuce and arugula can be a "crop cover crop" by letting them go to seed after the crop is harvested and becoming a tower cover crop providing shade and habitat, and maximizing efficiency rather than planting a different cover crop from seed.

One other example Zach described doing is additive planting of alyssum seed in his lettuce seedling trays. Alyssum is a common annual ornamental flower, but it also provides habitat for the hover fly. The larva of the hoverfly eat the aphids from the lettuce plants, thereby improving the lettuce.

The norm in agriculture focuses on short-term profit, limited diversity (monoculture), and tends to over invest in specialized heavy equipment (inflexible). The extreme alternative to industrial agriculture can be too diverse, unfocused and hard to manage. Zach proposes a different approach for agriculture that has more balance, resilience and profit, using organized diversity and efficiency, for instance intercropping rows of cover crops and vegetable production, where the cover crops can also act as windbreaks and habitat for beneficials.

For a farm to be sustainable, Zach believes that the two ideas of profit and resilience need to be joined together. Ecosystem service need to be understood and actively supported. A guild enterprise production model is the business model to manage a diverse farm with microenterprise. Production is done regeneratively with the methods of production supporting the actual produce (ex: cover crops, soil care, etc.).

Solutions are needed at every scale: urban, suburban, town, country, wilderness.

A few other ideas for supporting ecosystem services include:

- Windbreaks and riparian buffers.
- Guide naturally existing flows (ex: orientation and ventilation of garlic curing barn to take advantage of prevailing winds to maximize drying).
- Avoid toxic substances.
- Prioritize soil cover.
- Integrate productions ex: layering crops and cover crops.
- Continuity of flowering plants (habitat for pollinators).
- Reintroduce niche organisms.
- Work soil when it is just slightly moist (maybe don't rush in the spring if not necessary).

Questions:

Q: Where do high tunnels fit in?
A: Design and fit it into the ecosystem. For instance, you can plant a windbreak for a greenhouse to prevent the plastic from blowing off; plant shade strategically so as to avoid needing to use shade cloth in the greenhouse.

Q: What does your farm business model include?
A: Markets, CSA, food co-ops, farm events.

Q: What about disease/pest issues in "crop cover crop system"?
A: The crop cover crop plants can be left as a sort of pest bait plant, but you still need to use row covers for the rest of your main lettuce/arugula crop. Also, at the same time you could establish habitat for the predators of those pests.

Q: Do you incorporate trees/interplanting in your market garden?
A: The whole farm is in permanent raised beds. This allows Zach to create a pattern of annual and perennial production. (Mulch around the trees can be in rolls, or planted cover crops, or weed barrier that's slowly pulled back as trees establish, etc.) You can have whole rows of trees in this system.