

## Summary & Resources - Foxfire Farm June 2024 OAK Farmer Field Day



### Innovating Generational Farming Practices with Ecological Approaches and System Efficiencies

#### Event Summary

“Letting go” is nearly a mantra for Aaron Lange of Foxfire Farm, as he works to improve the crop production systems and profitability of his three acres of organic vegetables while reducing the time and labor required to keep the systems flourishing. Whether it’s letting go of crops that require extra time and space or long-held markets and management practices that no longer fit the family’s goals, whole-farm planning has taken on a new energy for Foxfire Farm. Stewarded since 1991 by Aaron’s parents, the farm has been in Aaron and Irina’s hands since 2021. While they still maintain the organic certification and commitment to land stewardship that the Lange farm has always held, Aaron and Irina have introduced new practices, markets and efficiencies to make the farm their own. At a recent Farmer Field Day, they shared their biointensive methods, sheep-crop integration and cover crop management with peer farmers and technical service providers.

#### Standardizing for Efficiency

Structured on a permanent field block-bed system with supporting buffer strips, Aaron’s three acres offer year-round field and covered crop production. Each of the farm’s five field blocks includes beds of consistent 100-foot length and 5-foot width, allowing the easy transfer of landscape fabric, row covers, irrigation drip tape and related supplies. The field blocks allow for a three-year crop rotation of cover crops, quick crops (e.g., lettuce, radish, beet) and long-term crops (e.g., tomatoes, peppers, cucumbers) and the flexibility to incorporate exceptions (e.g., sweet potatoes, sweet corn) and integration of their grazing flock of sheep. Aaron selects crops within the same bed that share planting, weeding and harvest timing to further the efficiency of movement and work in each block. He also tends to quick pruning/management while he harvests (e.g., removing broken stems from kale stalks or twining cucumber vines on the trellis).

Aaron utilizes woven landscape fabric and plastic mulch on long-term crop beds to reduce weeds and disease, support soil moisture/temperature and improve crop/field conditions. Reusable for seven years, the woven fabric is 95% white on one side and 95% black on the other, providing a reversible heat retention/reflection benefit. Using the “zipper method,” Aaron places the five-foot strips of fabric between the crop plantings (centered in their beds), allowing easy access to repair irrigation lines and apply amendments and a quick removal after crop harvest. NOTE: The USDA organic regulations require the removal of plastic mulch (including woven landscape fabric) from the field at the end of the growing or harvest season.

### Crop Rotations and Cover Crops

In the [fields](#) and [high tunnels](#) of Foxfire Farm, Aaron is implementing crop rotations for pest and disease reduction, plant health and diversity of the soil biology by preventing plants from the same families residing in the same crop bed for at least one year - sometimes three or more. Additionally, Aaron includes non-cash crop cover crops in his rotations during the cold months (winter rye, Austrian winter pea and crimson clover) and the warm season (buckwheat) to support pollinators, build soil organic matter, optimize soil nutrients available to plants, suppress weeds and keep his land “photosynthesizing” with living roots and protected soil.

### Livestock-Crop Integration for Soil Health

Foxfire Farm’s flock of ~20 Katahdin, Dorper and St Croix sheep are one of Aaron and Irina’s additions to a healthy whole-farm ecosystem. Each winter and early spring, the flock grazes the plant residues of cash and cover crop beds, feeding on quality hay (produced on-farm) and incorporating the plant matter and their animal wastes into the soil as they roam. These practices are supported by increasing research on the [“importance of livestock as a means of cycling nutrients, feeding soil microorganisms, and improving the aggregation and structure of soils.”](#)

NOTE: The USDA organic regulations restrict manure application to organic crops by what is known as the “90–120-day rule.” Producers may not apply raw, uncomposted livestock manure to food crops unless it is:

1. Incorporated into the soil a minimum of 120 days prior to harvest when the edible portion of the crop has soil contact; OR
2. Incorporated into the soil a minimum of 90 days prior to harvest of all other food crops.

### Crop Specifics

Aaron provided the Field Day participants with an abundance of information on specific crops and their management, included below:

- Garlic
  - 5 rows in bed, 9” spacing, plastic mulch
  - November planting > June harvest
  - Hardneck - hard to store due to surface moisture and curing process; provides scapes
  - Elephant - provides flowers
  - Pay \$30-35/lb for organic seed garlic, selling \$16/lb retail
  - Harvest hardneck when 50% green leaves die back; 40% softneck
  - Curing: 50% shade in greenhouse; will add another 50% for 75% shade. Maintain ~50% (max 80%) relative humidity - sometimes using boiler stove at night
- Onions:
  - Shallots, red and yellow sweet onions, storage onions - on plastic mulch

- 1.5" spring onions sold fresh - allows a representative sample to check the production size of full crop
- Peppers:
  - White on top landscape fabric for cooler temperatures
  - Carmen, snack peppers; some habanero, cayenne
  - Interplanting - Aaron's preference: low-spreading companion. Current pepper crop uses existing mulched bed with pre-made holes of 18" spacing for brassicas and filling holes with aromatic herbs (dill, cilantro)
- Cucumbers
  - Trellised with Hortonova netting between fiberglass poles strung with top metal line and tomato clips
    - Field Day participant shared Tape Tool (wineries use it)
  - Requires twisting cuke plants (will not cling like peas) - easy to do when harvesting
  - White-on-black landscape fabric
- Potatoes
  - Hills one time before mulching
  - Using sorghum cane mulch (sourced locally) to stimulate mycorrhizae
  - Will flail mow plant and sorghum mulch residue; sow buckwheat afterward
  - Hand-pick colorado potato beetle
- Brassicas:
  - Kale: Harvest and clean up full stem to primary stalk to reduce risk of harlequin beetle (they prefer old leaves) and disease
  - Fall: fabric, white side up. 2nd week of August = least pest pressure
  - Cabbage loopers are a fall pest issue; some organic producers use [BT as a control strategy](#)
- Okra
  - Fabric mulch for weed control, June-July; then replace w/ sorghum mulch
- Tomatoes (field)
  - [Daniel Mays \(Frith Farm, ME\)](#) method of trellising: T-post with carriage bolt and brace band, connecting 7/8-1" purlin pipe (Martin's) 6' high - need to bury T-posts deep enough for wind stability, and brace - especially in saturated ground
  - Pick them pink instead of ripe and let ripen fully off vine; seems to help with [yellow shoulder disorder](#)
- Lettuces
  - Warm-season varieties: Nevada, Muir, Blue Rock
    - Red Butterhead - bolting in a hot June
  - Bought in composted mulch - low-quality - tested with high pH, devoid of nutrients
    - Replenishing soil with 8lbs/bed feather meal - lettuces starting to recover

## Gratitude

OAK is grateful to Aaron and Irina Lange at Foxfire Farm for their time and efforts for this Field Day, to Grow Appalachia for providing essential participant support and to all the farmers and ag professionals who took time out of their busy schedules to share in the learning and conversation. [Grow Appalachia](#) and the U.S. Department of Agriculture's (USDA) National Institute of Food and Agriculture provided support for this Field Day.

## Related Resource Links:

### OAK Resources:

- [Soil Health and Climate-Smart Project](#) - Build soil health and improve on-farm resilience. Enrolled farms have access to direct technical and educational resources and receive incentive payments from implemented climate-smart practices. Learn more; apply today!
- [Upcoming OAK Farmer Field Days](#) - Hosted on working farms, these events highlight organic practices used in crop and livestock systems and best practices in production, marketing, business and resilience on Kentucky farms. Register today to learn from and with other farmers!
- [Annual Organic Farming Conference](#) - Save the date for OAK's 14th Annual Organic Farming Conference, *Grounded In Organics: From Soil To Market*, January 23-25, 2025, at Kentucky State University's Harold R. Benson Research and Demonstration Farm in Frankfort, Kentucky.
- [Organic Production Assistance Program](#) - The organic production consultation services provide dedicated organic technical assistance to Kentucky farmers who are currently using or interested in adopting or expanding organic practices.
- [OAK Transition Program](#) - Organic Transition specialists assist farmers who are interested in transitioning to USDA-certified organic production. Organic Specialists are available for one-on-one consultations, providing a personal level of service and technical assistance on-site, at the farmer's convenience.
- [Join OAK today!](#) The sustainable food and farming network in Kentucky is growing, and together, we can create a thriving local food system. Your support and participation helps OAK deliver educational programming, provide community outreach and enhance market opportunities for growers across Kentucky.! Receive discounts on OAK events and other member benefits!
- [Sign up for OAK newsletters](#) - For farmers and consumers, OAK offers a variety of regular communications to stay connected to Kentucky food and farming news, research and events.
- [OAK YouTube](#) - View recordings, snapshots and lessons learned from host farmers in past conference and field day playlists.
- [Suppliers and Farm Resources](#) on OAK's Find-A-Farm Directory

### Grow Appalachia Resources

- Grow Appalachia addresses food insecurity throughout central Appalachia through home and community garden initiatives, foodways, farming, and hunger relief programming. As a [Strategic Initiative of Berea College](#), Grow Appalachia partners with organizations, communities, and families in Appalachia to create healthy, resilient and economically viable food systems.
- [Beginning Farmer Series](#)
- [High Tunnels and Growing Supplies](#)
- [Garden Grants](#)

### Soil Health Resources:

- Soul Fire Farm's [How Alive Is My Soil?](#)
- [Cover Crops for Sustainable Crop Production](#) - Sustainable Agriculture Research and Education (SARE)
- [Managing Cover Crops Profitably](#) and [Building Soils for Better Crops](#) - SARE
- [Covers Under Cover: Managing Cover Crops in High Tunnels](#) - University of Kentucky et al

- [Cool-Season Cover Crops for High Tunnels in the Southeast](#)
- [Warm-Season Cover Crops for High Tunnels in the Southeast](#)
- [Cornell Soil Health Manual](#) - Cornell University's College of Ag and Life Sciences
- [Building Soil Health in the South](#) - Organic Farming Research Foundation (OFRF)

#### Crop Production Resources:

- [General Production Resources | Center for Crop Diversification](#)
- [Organic Agriculture | Center for Crop Diversification](#)
- [Crop Rotation on Organic Farms](#) - SARE
- [Community Supported Agriculture \(CSA\) Production Manual](#) of the Organic Farming Unit at the University of Kentucky
- Suppliers:
  - [High Tunnels and Growing Supplies](#) - Grow Appalachia, Berea KY
  - [Walk-Behind Tractors and Hand Tools](#) - Earth Tools, Owenton KY
  - [Farm/Garden Supplies](#) - Martin's Produce, Liberty KY
  - Aaron's preferred [Nitrogen amendment](#) - Ohio Earth Food, Hartville, OH

#### Crop-Livestock Integration for Soil Health Resources

- [Livestock As A Tool: Improving Soil Health, Boosting Crops](#) - National Center for Appropriate Technology (NCAT)
- [Incorporating Livestock for Soil Health video](#) - Soil Health Institute
- [Crop Livestock Integration](#) - Rodale Institute
- [Building Soils for Better Crops](#) - Sustainable Agriculture Research and Education (SARE)

#### Funding /Technical Assistance Resources and Service Providers

- Kentucky Center for Agriculture and Rural Development ([KCARD](#))
  - Free [business planning](#) for Kentucky farms and agribusinesses
  - [Funding assistance and grant information](#) (Kentucky and beyond)
  - Sign up under "GET UPDATES" on the [KCARD website](#) to receive e-newsletters
- U.S. Department of Agriculture (USDA)
  - Read this first! [A Guide to USDA Resources for Historically Underserved Farmers](#)
  - USDA [Farm Service Agency \(FSA\)-Kentucky](#)
    - [How to Start a Farm: Beginning Farmers and Ranchers](#)
    - Find your county's office in [West Kentucky](#) or [East Kentucky](#)
  - [USDA Natural Resources Conservation Service \(NRCS\)-Kentucky](#)
- Kentucky Department of Agriculture (KDA)
  - [Organic Marketing Program](#)
  - [Grants and Funding Opportunities](#)
- Grants:
  - [SOAR loan](#) - southern and eastern KY
  - [KSU Small-Scale Farm Grant](#)
  - [County Ag Investment Program \(CAIP\)](#) grant: county-specific! Ask your County Cooperative Extension Agent