

Summary & Resources - Lazy Eight Stock Farm June 2024 OAK Farmer Field Day



Reduced Tillage, Cover Crops and Crop Rotations on an Organic Vegetable Farm

Event Summary

“Sometimes our experiments fail, but we won’t improve if we don’t try new things.”

Such is the wise practice in farming trial and error that has allowed Bryce Baumann and his family to improve their systems at [Lazy Eight Stock Farm](#) - expanding their crop production while minimizing disturbance to the soil, building soil health and organic matter, reducing the use of plastic mulch and reducing the workload on the farm crew. Bryce shared this lesson, his system successes and a handful of cautionary tales at this June Field Day. He also stressed a few key strategies as the group toured the farm’s 25 acres of organic vegetable production:

- Standardizing the fields and rows allows for easier crop rotations, efficient tractor/equipment use and simpler calculations (drip tape, row cover, etc);
- Grouping and rotating crops with similar needs in soils that suit them best;
- Building a diversity of crops above ground that brings pollinators, reduces weed pressure and added fertility needs and allows for the intercropping of cash crops on less land;
- Employing a suite of tools (equipment and crop management) allows for the preparation of a shallowly-prepared seedbed, cultivation of weeds at “thread stage,” termination of cover crops above the soil and limited soil disturbance at any time.

Soil scientists and conservationists with the USDA’s Natural Resources Conservation Service (NRCS) joined the event and shared demonstrations of in-field soil tests that provided visual examples of what Lazy Eight’s practices are building underground and showed the benefits of healthy soil. Through their participation in OAK’s [Climate Smart Project](#), Lazy Eight Stock Farm has committed to continuing the experimentation and implementation of on-farm conservation practices. Bryce shared about his work with OAK’s staff and the Global Farm Metric tool to assess his on-farm climate-smart practices as part of the whole farm’s sustainability.

Fields and Crop Management

Bryce and his crew previously farmed 150-foot beds, moldboard plowing each year and then using a field cultivator and tiller to create a clean seed bed. However, he found that this system required too much movement of large tractor implements and overworked the soil. Their current system is built around standardized 500-foot beds of 6-foot width and uses smaller equipment that decreases tillage intensity and reduces the tractor turns. (Bonus: The field corners are now spaces for perennials like asparagus, native pollinator habitat or summer stands of buckwheat.) On the first pass, Bryce uses a disc chisel plow to slice the soil into clods without turning it (timed before a good rain for better infiltration and paired with sweeps for cutting taproots) and then uses a power harrow to work just the soil surface. Bryce occasionally uses a flame weeder to create the “stale seedbed” before harrowing, but acknowledges that effective flame-weeding has a narrow window to tackle weeds before the crop surfaces.

Lazy Eight Stock Farm has multiple soil types throughout its fields, so Bryce and his crew group similar soils when determining crop rotations, placing crops that do better in each soil type (e.g., bottomland soil is too heavy for potatoes) with crops that have similar needs and growth, while also trialing complementary crop pairing. Bryce shared an example of peppers planted two rows to a bed, with one row of bush beans between to maximize the space. This allowed Bryce to get the longer-term pepper crop fully established and to make a few cultivation passes before planting the beans down the middle. The cultivation also served as tillage, prepping the soil for the beans, which grew quickly and “closed the canopy” over the bare soil, shading the developing peppers from sunscald. Another example was a three-row bed of lettuce, interplanted with two rows of radish or hakurei turnips - all quick-growing crops with little to no bare soil remaining (and no plastic mulch). Additional trials for intercropping have included kale with tomatoes in high tunnels, allowing for a broader diversity above/within the soil, and lettuce with carrots to gain a quick-growing cash crop in the same bed space as the slow-growing carrots.

Cover Crops: A Critical Tool

Building cover crops into the field rotations can be a challenge and a saving grace for Lazy Eight's systems. The use of cover crops has varied based on their goals of managing weeds or disease, preventing/controlling erosion and soil runoff, supporting pollinator habitat and developing soil organic matter, structure and biology. Scheduling the seeding, mowing and incorporation of cover crops into field crop rotations can be challenging. Working to seed cover crops at the best time (and following NRCS' guidelines) can overlap with crop harvest timelines, especially on a diversified vegetable farm, so Bryce is working in rotations that allow field blocks to remain out of production for a full or half season. A field of fast-growing buckwheat can provide the soil with living roots below ground (feeding the soil biology) and cover/protection above ground, while improving fertility (encouraging nitrogen and scavenging phosphorous) and supporting beneficial insects (lacewings help control aphids in potatoes and tomatoes). Allowing harvested crops to overwinter (e.g., fall brassicas) is another one of Lazy Eight's cover cropping strategies that protect the soil from winter weather effects.

In past years, Bryce managed cover crop residue by disking and working the ground to incorporate the plant matter into the soil, believing it was necessary to do a full turning plow, but the switch to using a flail mower has allowed the crew to chop the residue so it decomposes more quickly without having to overwork the soil. Bryce claims the flail mower is an essential tool for his minimal tillage system.

Equipment for Healthy Soil

Lazy Eight's equipment is a collection of used and refurbished tools familiar to many Kentucky farmers (e.g., finger-type tobacco setter, carousel transplanter), essential tools worth the investment (e.g., flail mower, power harrow) and imported specialty implements (e.g., rod harrow, torsion weeders). While a deep suite of equipment does require maintenance time/attention, the diversity of tools to meet a diversity of needs is the backbone of the farm's cultivation program and the (perhaps surprising) secret to their minimal tillage.

[OAK's Production Specialist](#) Sarah Geurkink put together a list as Bryce shared his collection:

- 5-row cultivator toolbar (stacked weeding tools)
 - Knives are ½" deep, slice the soil
 - Knives are followed by a [rod harrow](#) from Hak (arrived in three days from the Netherlands!) which will break up any clods
 - [Torsion weeders](#) in the back cultivate more aggressively without damaging crops
 - Applicable to multiple scales (torsion, other cultivating tool attachments available for wheel hoes)
- [Basket weeder](#)
 - Front baskets/wires drive the back ones (back ones go faster) and disturb more surface soil/weeds
 - Used for between-row weeding and shattering the soil crust layer that can form after a rain
- [Finger weeder](#)
 - More aggressive (more disturbance), deeper in soil
 - Good for weeds beyond thread stage
 - In Lazy Eight's first year with finger weeders they only hand-weeded one field!
- [Tine weeder](#)
 - Disturbs soil surface just enough to kill a lot of thread-stage weeds without bringing up new soil and weed seeds
 - Blind cultivation
 - Picks up plastic bits left by plastic mulch
 - Drags out Johnson Grass rhizomes (the Farm's nemesis)
 - Lazy Eight includes some kind of tine or torsion weeder behind most of their cultivation tools
- High Clearance toolbar (stacked weeding tools on a toolbar)
 - S-tines followed by torsion weeders
 - For taller, longer-term crops (e.g. kale, peppers)
- Farmall 140 with side knives/pumpkin knives
 - Goes under cucurbits after they vine out
- Plastic mulch and Landscape Fabric
 - Lazy Eight uses only for strawberries, for disease/weed-prevention, and eggplant, for flea beetle control
 - They use landscape fabric between mulch beds to prevent pooling and erosion
- Planting Implements:
 - Finger type tobacco setter - rubber fingers grip plants - works well for taller transplants not in ground on time and sweet potatoes

- Carousel (works better for transplants)
- 300 gallon tank for water (never full because that would require a lot of horse power to pull along)

Assessing the Soil

Scott Aldridge, NRCS Soil Scientist, provided the Field Day participants with a visual demonstration of the importance and benefits of maintaining healthy soil through minimal disturbance, living roots and vegetative cover, creating a diversity of life above and below the soil surface. Scott shared an infiltration example that clearly showed the essential role that roots and organic matter play in maintaining soil stability. A complimentary slake test shared the obvious runoff that bare, clodded soil creates, countered with the water-holding capacity and more solid structure of the healthy “living” soil.

Working the soil with heavy equipment and multiple passes increases compaction - reducing air and water in soil - and decreases “aggregate stability” or structure. Soil organisms, Scott explained, increase in abundance and in variety of species when the soil is not disturbed. Fungi in particular make proteins, such as glomalin, that ooze into the soil and help “glue” soil particles together. An “ideal soil” is around 45% mineral soil, 5% organic matter, 25% air and 25% water - reinforcing the need for infiltration and healthy soil structure. (Find more information about performing these in-field soil tests in the [Field Day participant packet](#).)

Gratitude

OAK is grateful to Bryce Baumann, his parents Carla and Lothar Baumann and the entire crew at Lazy Eight Stock Farm for their time and efforts for this Field Day, to the USDA NRCS staff who presented, supported and attended the event, to Central Kentucky Ag Credit for providing essential participant support and to all the farmers and ag professionals who took time out of their busy Spring schedule to share in the learning and conversation.

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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, educational and 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 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 organic farming network in Kentucky is growing. Together, we are creating a thriving regional food and farming network. Your support and participation helps provide resources to farmers, inspire community members, and enhance organics across KY!
- [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

Climate-Smart Agriculture Resources:

- [Soil Health and Climate-Smart Project](#) - Build soil health and improve on-farm resilience. Enrolled farms have access to direct technical, educational and resources and receive incentive payments from implemented climate-smart practices. Learn more; apply today!
- [Climate-Smart Practices](#) highlighted at Lazy Eight Stock Farm Field Day:
 - [Conservation Crop Rotation](#)
 - [Cover Crops](#)
 - [Conservation Tillage](#)
 - Details of the USDA-NRCS Practice Standards for the three Practices above are included in the [Field Day participant packet](#).

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
- [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:

- [OAK virtual event recordings with Bryce Baumann, Lazy Eight Stock Farm](#)
- [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

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 [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:
 - [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