Summary & Resources - Cedar Ring Greens
June 2023 OAK Farmer Field Day

Integrating Sustainability In A Solar Farmhouse And Organic Market Garden

Cedar Ring Greens farm in Frankfort has operated for nearly two decades with a firm commitment to sustainability - this commitment and the resulting systems of renewable energy use and creation and organic, low-input, minimal-till farming were the focus on conversation and learning during this June Field Day. Andy McDonald showcased his family's home, renovated to net zero, with grid-tied solar panels for electric and water needs, passive solar elements, intentional insulation and design, and energy efficient systems. Mehera Baugher highlighted the farm's vegetable beds, featuring natural mulching, cover crops, biointensive tools and practices, and season extension.

From 2009 to 2015, Andy McDonald was busy! Purchasing a house of sheetrock, plaster, brick and lead paint and renovating it to a well-insulated, energy-efficient building envelope using solar energy took a lot of time and work, but the results allow his family home to produce more energy than they use. Andy walked participants through the timeline, including:

- Removing lead paint
- Trenching and adding drain pipe to divert water away from house
- Restructuring crawlspace and leveling the foundation
- Adding gravel, 6 mil plastic, insulation and concrete to create new floors
- Insulating the existing thermal mass inside North and East brick walls with 6" styrofoam and 3 coats of stucco (R32-40)
- Relocating original flooring materials to create a ceiling with exposed rafters, air-sealed with Tyvek and 18" insulation under metal roof (R60)
- Renovating interior to leave gaps at top of walls for ventilation and air circulation
- Installing dual-chamber dry composting toilet and greywater system
- Creating addition on South and West walls with
    - Structural insulated panels (SIPs), foam insulation and 3 layers stucco (R30 walls and R-55 roof)
    - Green Roof design with 3" crushed brick and gravel, flat roof, and sedum plants
    - Loofah gourd trellises and climbing vines on patio structure for living shade

- Trombe wall with repurposed glass for heat retention

Several of these renovations and designs allow Andy's house to make best use of passive solar design for heating, complemented by the wood stove which offers primary heat during the cool months. Additionally, Cedar Ring Greens' active solar energy has grown as the family and their needs have grown, from an original array of 5 solar panels (which at 1400KwH/year provided 100% of the family's energy needs in 2011) to 9 panels in 2017 and then 29 in 2020, which now produces more than the family needs (even with an electric car). These current arrays are grid-tied to the Kentucky Utilities system, allowing Andy to receive kilowatt-hour credits for energy fed back into the grid, via a net-metering agreement.

Along with a solar hot water collector, the passive solar design and wood heat, and absence of an air-conditioner allow Andy's family to avoid use of the three primary consumers of electricity in the average American home: AC, electric heat, and electric water heaters. (Andy noted that 75% of a family's hot water needs can be supplied with a solar hot water system - although these are not commonly used in the US, as solar electric photovoltaic systems have become much cheaper.) He shared his business contact information and related resources (listed below) so that anyone interested in learning more can reach out to him at Apogee-Climate & Energy Transitions for support.

In 2021, Mehera Baugher came to work on Connie Lemley and Andy's farm, learning certified organic regulations and the land, practices, and markets that Connie had developed since 2009. Mehera quickly learned Connie's systems and, using her experience on urban farms in Chicago, continues as Cedar Ring Greens' full-time farmer. With a little help on harvest days, Mehera grows organic produce for Franklin County Farmers Market, online orders, and two local restaurants.

Growing mostly in open beds with access to the farm's Haygrove tunnel and a couple of caterpillar tunnels, Mehera primarily uses row cover,ProtekNet, and shade cloth for pest protection, shade, and season extension. She makes use of the enclosed space under the row cover to exclude flea beetles and cabbage moths from her brassica crops. She also uses row cover directly on the ground after direct-seeding to retain moisture in the soil and improve germination. For transplanted crops, she adds a layer of mulchy compost on top of the native soil for moisture retention and weed suppression. Growing a popular salad mix and other baby greens, Mehera finds herself flipping beds from one crop to the next fairly frequently, planting new beds every week and turning in harvested beds approximately 4 weeks after seeding.. She'll harvest the greens, flail-mow the spent plants with a Grillo walk-behind tractor, leave the cuttings and plant residue, and lay a tarp over the bed for around one month, after which she'll rake the residue and prepare the bed for the next planting. For this final bed prep, Mehera often utilizes a tilther to smooth the top 1/2" to 1 1/2" of soil before seeding or transplanting. For direct seeding, Mehera uses a Jang seeder, and shes uses Winstrip trays for growing transplants.

In-between crops, Mehera appreciates the use of quick or seasonal cover crops, using buckwheat, in warm weather quick rotations, or buckwheat + sunn hemp for longer warm weather rotations for greater biomass residues; and over winter, she's used winter rye with crimson clover or vetch. For those latter biomass-rich cover crops, she mows and then tarps the crop, creating a natural mulch to transplant into in the following season. Making use of Connie and Andy's practice of laying wood mulch around the perimeter and walkways of some beds, Mehera will also lay landscape fabric for a

quick and effective pathway deterrent to weeds. Admitting that she'd prefer a living or natural mulch pathway, she concedes to limited time and makes the best of what time and tools she has.

OAK is grateful to Andy and Mehera at Cedar Ring Greens for this opportunity to tour and learn about their renewable energy and organic production systems in a community of interested farmers and ag professionals!

Resource Links:

- **OAK resources:**
  - **Join OAK today!**
    - Find-A-Farm Directory - OAK Family Farm Members
    - Asterisks below indicate OAK member discounts
  - **OAK YouTube** farmer resources / conference and field day playlists
  - **OAK Transition Trainer** - for assistance with, or info on certifying organic
    - USDA's National Organic Program and OMRI-listed products for compliance
  - **OAK Field Days! Register NOW!***
- Suppliers / Products
  - Suppliers and Farm Resources on OAK's Find-A-Farm DIrectory
  - Arbico Beneficial Nematodes - OMRI-listed for compliance with organic certification
  - Thoroughbred compost* - KY-based; ask for OMRI-listed for compliance with organic certification
  - Charlie's Compost - KY-based; ask for OMRI-listed for compliance with organic certification
  - ProtekNet - from Johnny's*
  - Mehera's favored varieties - from High Mowing* or Johnny's*
    - Lettuce: Muir, Nevada (esp for summer sweetness)
    - Salad mix: Tokyo Bekana, Easy Leaf, pak choi, purple mustard
    - Peppers: Cupid and arrows, Carmen, Korean sweet pepper (for kimchi)
- Potential Funding Resources
  - 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
  - USDA Rural Development -
    - REAP Grants and Guaranteed Loans for renewable energy and energy efficiency projects for farms and rural small businesses
      - REAP Renewable Energy & Energy Efficiency Factsheet.pdf
      - Grant Writers-Auditors-Environmental Firms 6-12-2023.docx
      - NSAC overview
    - Value-Added Producer Grant to generate new products, create and expand marketing opportunities, and increase producer income.
      - VAPG Fact Sheet.pdf

    - The Kentucky Agricultural Development Fund offers an On-Farm Energy Efficiency Program to help Kentucky farmers with energy projects.
        - KADF On Farm Energy Grants
        - 2023 Guidelines
    - USDA Natural Resources Conservation Service (NRCS)-Kentucky
        - Organic Management NRCS Conservation Practice Standard - Coming Soon; In Development
        - Conservation Plan Supporting Organic Transition
    - SOAR loan - southern and eastern KY
    - KSU Small Scale Farm Grant
    - County Ag Investment Program (CAIP) grant: county-specific! Ask your County Extension Agent
- Renewable Energy Resources
    - Apogee-Climate & Energy Transitions - Earth Tools
        - Andy McDonald, Andy@ApogeeClimate.org or (502) 699-2553
    - KY Solar Energy Society
        - Solarize Frankfort - homeowners in Franklin County and its six surrounding counties (Anderson, Henry, Owen, Scott, Shelby, and Woodford), as well as small businesses, places of worship, and non-profit organizations.
        - Solarize Lexington - homeowners in Lexington-Fayette County, as well as small businesses, places of worship, and non-profit organizations.
        - Solar Over Louisville - applicants in the Louisville/Jefferson County and surrounding counties (Kentucky: Jefferson, Oldham, Spencer, Shelby, and Bullitt; Indiana: Harrison, Floyd, and Clark counties))
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- Soil Health Resources:
    - Cover Crops for Sustainable Crop Production - Sustainable Agriculture Research and Education (SARE)
    - Building Soils for Better Crops - Sustainable Agriculture Research and Education (SARE)
    - Cornell Soil Health Manual - Cornell University's College of Agriculture and Life Sciences