

Summary & Resources - Pavel's Garden April 2023 OAK Farmer Field Day



Growing Under Cover on a Market Vegetable Farm

With six 14'x100' caterpillar tunnels, one 30'x96' high tunnel, and 15 years growing in these protected environments, Pavel and Katie Ovechkin offered Field Day attendees a rich overview of their production systems and lessons learned at [Pavel's Garden](#) in Crestwood. Krista Jacobsen, agroecologist and sustainable agriculture professor from the University of Kentucky, shared research findings and conversation with the group about salt buildup in covered production, compost/manure applications, and soil-borne pathogens (details below).

Growing primarily in Classic (quonset-style) tunnel kits from Farmer's Friend that he's modified over time, Pavel walked the group through various tunnel features that he's found work best in his system.

Older, low-cost options included:

- Center purlins and wind bracing bars added to simple cat tunnel kits to reinforce stability
- Simple tie-back or rollup endwalls, as most endwalls stay open throughout majority of season
- Hand-rolling up plastic slides inside support ropes (rolled inwards to avoid water buildup in plastic)
- 16" RV anchors added to each end of tunnel, for extra wind support
- Field irrigation lines hung upside-down in tunnel for overhead irrigation that doesn't swing as much in the wind
- Woven ground cover along and just outside each endwall for weed pressure reduction

Newer upgrades transformed one 14' x100' cat tunnel into a more traditional hoophouse, with...

- Solid endwalls with DIY door frames formed with conduit and wiggle wire channels
- Hipboards with double wiggle wire channels
- Hand-crank rollup sides with bottom of plastic wrapped on conduit
- Wooden baseboards

Pavel and Katie shared favorite tools throughout their tunnel and field production (hand tools and walk-behind tractor), as well as in their pack shed and greenhouse. Here's a quick glimpse into each area's highlights...

Tunnel and Field Production:

- 30% shade cloth (covering every tunnel from end of May to fall)
- Landscape fabric (laid alongside tomatoes, with pre-cut holes for quick-harvest crops)
- Wheel hoe (Glasser from Johnny's, with oscillating hoes; cultivation and removal of lettuce/ salad greens post-harvest)
- Broadfork and (drill-powered) tiller (for bed prep in between crops)
- Quick-cut greens harvester (from Farmers Friend; great for Red Russian kale, long-stem greens; requires weed-free beds, even-sized leaves)
- Dibbler (from 2 Bad Cats LLC; for marking beds for efficient crop spacing)
- 4" auger (used in ice fishing; powered by drill, it digs perfect quick holes for transplanting)
- Soil blocks (3' for tomatoes and other nightshade family crops, some flowers)
- Row cover (15x100 matches tunnel/bed length; frost protection and flea beetle barrier for brassicas; check out this tutorial for storing row cover in "[daisy chain](#)")
- ProtekNet (flea beetle barrier for brassicas as they mature; just don't let the Net touch the leaves - beetles can lay eggs thru this fine mesh netting)
- Flail mower on walk-behind tractor and (Southern States) UV-stabilized "float bed cover" tarp (for cutting and covering to terminate rye cover crop)
- UV-stabilized sandbags (for holding tarps flat; Pavel buys different colors each time so he can keep track of how old they are over time)
- 8' deer fence (surrounds entire market garden)
- Qlipr trellis system (from Farmers Friend; no need for ladders, non-plastic, reusable!)
- Tips for tunnel protection from high winds and weather:
 - With winds coming from South and his tunnels oriented North-South, Pavel will close up South endwall and open North endwall, and tighten his ropes
 - Endwalls stay open unless temperatures predicted <30 degrees F
 - Quonset caterpillar tunnels recommended; gothic-style cat tunnels tend to buckle (Gothic roof recommended for high tunnels)
- Crop variety selections for tunnels:
 - Bolt-resistant lettuce (with good irrigation, can work in summer)
 - Tomatoes (anything compact, require no trellising; fave: BHN red slicer)
 - Arrowhead spinach (longer stems; Pavel plants spinach only late fall-early spring)
 - Celery (spring>fall; prefers tunnels to field grown, as doesn't rot or get soil splash)

- Challenges and solutions:
 - Soil salt buildup in tunnels: compost and organic matter in soil may buffer buildup that occurs from drying of soil; irrigating 25% longer also helps. Ideally, plastic is removed annually or semi-annually to allow flooding of soil via rains
 - Compost / manure applications are best applied in fall, which allows for spring harvest following Food Safety/Organic regulations and doesn't rob spring crops of essential nutrients
 - For compost used in Certified Organic production:
 - Bagged commercial compost should be [OMRI](#)-listed (ie NOP-approved).
 - C:N ratio, temperature, moisture, oxygen, ingredient restrictions and recordkeeping - learn more [here](#) and in the Regulations [here](#) and [here](#).
 - For Food Safety and Certified Organic production: Manure should be incorporated into the soil not less than 120 days prior to the harvest of a product whose edible portion has direct contact with the soil surface (eg lettuce), or not less than 90 days prior to the harvest of a product whose edible portion does not have direct contact with the soil surface (eg tomatoes)
 - Sclerotinia: These plant diseases can present as white mold but may also be timber rot (tomato), drop (lettuce), and head rot (cabbage). Rotation of crop families is essential to avoid/reduce infestation; resistant crop varieties may help; timing of planting and solarization with tarps are also potential avoidance techniques
 - [Videos](#) explaining current research on sclerotinia-related [lettuce drop](#) at UK, from [IPM Field Day](#) playlist
 - UK Plant Pathology: [Sclerotinia Diseases of Vegetable Crops](#)

Packshed:

- DIY packshed (carport-style shelter added to side of storage barn; metal roof, corrugated plastic sides (walk-thru door on one), rollup plastic front allows for ventilation/cooler temps in summer; enclosed environment with small propane heater for winter)
- Food-grade bins (harvest, storage; can serve as dunk tanks for washing greens)
- DIY barrel washer for roots (Repurposed concrete mixer with inserted food-grade baskets)
- DIY spin washer for greens (repurposed washing machine with food-grade basket inserted)
- DIY germination chamber (walled-off section of cold storage kept at higher temp for germination; doubles later in season for storage of produce not requiring full refrigeration)

Greenhouse:

- Double-wall plastic (with blower for insulation in-between)
- De-icing cables and heat mats (for warmer soil temperatures, germination)
- Soil block makers
- Winstrip trays (from Neversink Farm; mimics air pruning of soil blocks)

Resource Links:

- **OAK resources:**
 - [Join OAK today!](#)
 - [Find-A-Farm Directory](#) - OAK Family Farm Members
 - any resources with an asterisk below offer 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](#)
 - [OAK Field Days! Register NOW!*](#)
- Suppliers / Products
 - Caterpillar tunnels / high tunnels:
 - [Scenic Acres](#), Elkton KY - best to call /visit them
 - Grow Appalachia's [growing supplies/tunnels](#), Berea KY
 - [Martin's Produce Supplies](#), Liberty KY - best to call /visit them
 - [Farmer's Friend](#)
 - [Two Bad Cats LLC](#) - Pavel's dibbler, plant poppers
 - [Farmers Friend](#) - caterpillar tunnels and parts, Qlipr trellis, Quick-cut greens harvester
 - [Neversink Farm/Tools](#) - Winstrip trays
 - [Johnny's Seeds*](#) - wheel hoe, tilter
- Potential Funding Resources
 - [KIVA Zip Loan](#) - Pavel's funding source for his high tunnel
 - [SOAR loan](#) - southern and eastern KY
 - [KSU Small Scale Farm Grant](#)
 - [County Ag Investment Program \(CAIP\)](#) grant: county-specific! Ask your County Extension Agent
- Farmer-led resources
 - [Instagram](#) - Pavel's go-to source for learning visually about peer innovations on other farms
 - [Farm Hack](#) - worldwide community of farmers that build and modify our own tools