

Workshop Title: Managing Pest and Disease in Organic Vegetables with Tim Livingstone

Speaker(s) & their titles: Tim Livingstone, Strawberry Hill Farm (NB)

Executive Summary

Tim Livingstone and his wife Kirsten have owned Strawberry Hill Farm, a mixed livestock and 10-acre vegetable farm, since the summer of 2011. In this presentation, Tim talks about some of the common pest and disease problems they have encountered on their farm over the years, and how to deal with them organically.

Detailed Notes

Common pests and diseases that they encounter:

- Insects they deal with (*refer to slide 2 for the full list*)
- Diseases and predators, climatic factors (*refer to slide 3 for full list*)

Tools to address pests

1. Resistance

- Starts with variety selection at seed selection in winter
 - Blight resistant tomato varieties (Mountain Magic, Defiant)

2. Exclusion

- Straw mulch, row cover, Biotello, Proteknet
 - Mesh tunnels to keep out tarnish plant bugs out of peppers
 - Net to exclude raccoons (extra cost, \$1-2 of the cost of a dozen corn produced goes towards paying for fence, but it's worth it for them because the clients like having sweet corn in baskets) ---baited strand for deer
 - Floating row cover: 50'x300' pieces, with sand bags around the edge, keep out beetles from brassica crops. Important to stitch edge down carefully so they can't get underneath---put on before plants emerge. For hakurei turnips, leave it 1-2 weeks before harvest to keep out root maggots. Floating row covers also keep out cucumber beetles.
 - Biotello heats soil quickly, keeps dirt from splashing up on lower leaves of lettuce, which prevents sclerotinia. Use the opaque kind which he doesn't find heats too much in summer.
 - Mulches generally help with regulating soil moisture

3. Companion planting – at their scale, they would like to add more companions but it's a challenge at 10 acres. They rely more on crop rotation.

- Squash planted under corn is supposed to prevent raccoons, but they are still a problem.

- Buckwheat is very beneficial in a rotation, keeping out grassy weeds. A summer fallow in buckwheat eliminated one field of grassy weeds, which had been a big problem field.
4. Timing – timing of pest emergence, plant growth
- Transplant all early cole crops to give them a head start against flea beetles
 - Plant potatoes early to beat late blight. Late blight is a problem in their area, since they are growing in “potato country”.
5. Beneficials – can buy in (they don't buy much except for the beneficials that they introduce in the greenhouses. They have also introduced nematodes outside to deal with grubs in soil)
- Purchase for greenhouse---contact Koppert or Biobest for effective options, they offer advice based on what pests you're dealing with
 - Outside---keep spraying to a minimum, because you can kill your beneficial insects (i.e. soldier beetles, ladybugs)
6. Foliar sprays
- Rotten fish sprayed on sweet potatoes to keep back deer. Contributes to resistance---contributes to plant health
 - Horsetail or comfrey teas (they have not used these but they are interested in trying)
 - Fish/Seaweed blend prevents the tarnish plant bug
 - Deterrents work better outdoors because the greenhouse is a confined space. The pests will just adapt to the deterrent because they can't physically leave the space.
7. Organic pesticides – Tim doesn't like to spray; it's a last resort at his farm. When he does choose to spray it's in a conscientious manner targeting problems.
- Entrust-Controversial----last line of defense! Used on crops less likely to be visited by bees.
 - Dipel 52x is used against cabbage worms (and possibly diamond back) Now he sprays only twice a year---used to spray 7-10 times. Natural predators for the cabbage worm have come up from the US, which has reduced the need for spraying.
 - Serenade
 - Parasol 50 WP

Photos of insects (courtesy of the internet---refer to slide show for pictures): Common insect pests and how to deal with them

Potato beetle: They grow an acre of potatoes per year. They use Entrust for potatoes 1-2 times in a season, waiting until up to a 1/3 of the leaves have been defoliated and

then spraying (spray in evening, with no rain in forecast). After one spray they may or may not have to do it again...Potato Beatles are a huge problem in their region.

Wire worm: If you see two at the same time, you have a problem! If you have them they'll be around for a while, will generally be in soil just coming out of pasture (issue in Nova Scotia). Buckwheat in rotation helps with wire worm control.

White grub: Bad on strawberries, they eat the roots. They will also chew out portions of tubers in potatoes and sweet potatoes. Can be controlled with beneficial nematodes which Tim introduced on his farm.

Corn ear worms

European corn borer: Some trouble in corn and a little bit in potatoes, not really a huge problem. When the tassels are up, and the odd tassel comes down it's a sign of the corn borer (they set up heliothis traps for control)

Striped cucumber beetle: They control it through exclusion mainly with row cover

Squash bug: They are there, but they haven't witnessed much damage from it

Root maggot: Cause damage in rutabaga, a bit of a problem but not much

Fungus gnat: They find them in the greenhouse, in bark based soil mixes

Thrips: Greenhouse pest, which also cause damage in onions. At their farm they are not a problem in either the field or greenhouse

Aphids: Attracted to plants fed with a lot of nitrogen. They are hard to get rid of once they are there. Over-feeding leads to aphid infestation. Aphid sugars will produce a gray mold sometimes (aphid "dew"). Aphids in the greenhouse---lady bugs are NOT the best method of control, must use a small predator that gets into the plants tips where the aphids are and the ladybugs are too big for this.

Flea beetles: Very bad on young seedlings...must cover before seedling emergence or they kill cotyledons

Late blight: (potato) If someone in your area knows it, ask for help (there can be other things that looks like it). Must remove plants! Can travel down and affect potatoes and cause rot---do NOT plant tubers next year affected by late blight.

Downey mildew: Shows up on onions, but they don't experience it too much

Common scab: Caused biologically, lots of organic matter can actually promote scab

Sclerotinia in lettuce: Rot on the bottom brown leaves, must use a cover (mulch) to prevent contact with soil.

Planning---Arsenal of Options--use them!

Examples of problem crops and pest/disease management strategies

Sweet corn: Least profitable crop, but most desired crop because of popularity. Heat soil with row cover before seeding for warm soil and good germination.

- Other problems: Borers, raccoons, ear worms
- Plant close to house for monitoring
- Spray only if needed
- Coon fence: 20-inch electric fence---very effective deterrent

Brassicas: Slow early start, heavy feeders, some problems with sclerotinia, and flea beetles

- Harvest early cabbage on time and store, to avoid spread of sclerotinia rot

Squash, melons: Need lots of heat, get transplant shock (they only transplant melons, and direct seed their squash into biotello). They put a sheet of row cover over their direct-seeded squash in 50 ft wide strips, which allows for cultivation in the alleys.

Some final notes on deterring deer

- Changing smells will deter them. They use rotten fish to deter then use single strand electric fence with bait, which is a peanut butter mix in foil. They try to eat the bait and their noses touch the fence and they get shocked.
- The bait/fence deters the deer for about 3-4 weeks ---they have to rebait every month or so
- Depth also discourages deer from jumping, as they have bad depth perception

Final remark: "When we kill a predator, we inherit their job." Spray only as a last resort!