

NY and NE Vegetable and Small Fruit IPM Working Group Meeting
Lake Morey Inn, Fairlee, VT
December 17-18, 2018

Attendees:

UCONN

- Mary Conklin – UConn, fruit mary.conklin@uconn.edu
- Shuresh Ghimire – UConn, veg shuresh.ghimire@uconn.edu

CORNELL

- Meg McGrath – Cornell, veg mtm3@cornell.edu
- Laura McDermott -- Cornell, fruit lgm4@cornell.edu

MAINE-UMAINE and MOFGA

- Alicyn Smart – UMaine, diagnostics alicyn.smart@maine.edu
- Dave Handley – UMaine, fruit & veg david.handley@umaine.edu
- Lily Calderwood-UMaine, low bush blueberry lily.calderwood@umaine.edu
- Caleb Goossen – MOFGA cgoosen@mofga.org
- Eric Sideman – MOFGA esideman@mofga.org

UMASS

- Katie Campbell-Nelson – UMass, veg kcampbel@umass.edu
- Sonia Schloemann, UMass, fruit sgs@umass.edu
- Genevieve Higgins – UMass, veg ghiggins@umass.edu
- Lisa McKeag – UMass, veg, food safety lmckeag@umass.edu
- Sue Scheufele – UMass, veg sscheufele@umext.umass.edu
- Angie Madeiras - UMass, diagnostics madeiras@umass.edu
- Liz Garafalo, UMass, fruit egarofal@umass.edu
- Elsa Petit, UMass, grapes epetit@umass.edu
- Hilary Sandler-UMass, Cranberry Sta, fruit hsandler@umass.edu
- Sai Sree Uppala, UMass, Cranberry Sta, fruit suppala@umass.edu

UNH

- Anna Wallingford – UNH, Insect IPM anna.wallingford@unh.edu
- Heather Bryant – UNH, fruit & veg heather.bryant@unh.edu
- George Hamilton – UNH, fruit & veg george.hamilton@unh.edu
- Jeremy Delisle – UNH, fruit & veg Jeremy.delisle@unh.edu
- Becky Sideman – UNH, veg & berry becky.sideman@unh.edu
- Olivia Saunders – UNH, fruit & veg Olivia.saunders@unh.edu

URI

- Heather Faubert – URI, diagnostics, fruit & veg hfaubert@uri.edu

UVM

- Ann Hazelrigg – UVM, diagnostics ann.hazelrigg@uvm.edu
- Gabriella Maia– UVM, diagnostics gabriella.maia@uvm.edu
- Terry Bradshaw – UVM, Catamount ed farm terence.bradshaw@uvm.edu
- Scott Lewins – UVM, vegetable insect mgt scott.lewins@uvm.edu
- Becky Madden – UVM, nutrient management rmaden@uvm.edu

Agenda:

Vegetable IPM:-December 17, 2018

10:00 am	Introductions
10:15-12:00	Pest and disease issues for each state new hires, new programs, interpretative dances related to veg IPM, etc. ~20 minutes/state. Please bring a thumb drive with any images, etc.
12:00	Lunch
1:00-2:00	Pest and disease issues for each state new hires, new programs, etc.,~20 minutes/state.
2:30-4:00	Priority Setting-come ready to discuss priorities for future work and initiatives in veg IPM education, extension and regulatory issues.
4:00-6:00	Vegetable and Small Fruit Guide discussion led by Katie Campbell-Nelson and Sonia Schloemann
7:00	Dinner

Small Fruit IPM:-December 2018

8:00 am	Intro and basically the same agenda for Small Fruit IPM ending at 3 pm. If we don't finish, anything left can be done through emails, etc.
---------	--

NOTES, as taken by Genevieve Higgins

Meg McGrath – NY/Long Island

- Long Island very wet
- Late blight – yearly before 2015, none in 2015 and 2016, 2017 and 2018 arrived late
 - Not always sure where it's coming from or why it's *not* spreading
 - 2018: new strain in NY – US 25, opposite mating type of dominant genotype (US23), resistant to mefonoxam
 - USA blight still has funding for genotyping isolates
 - Phytophthora nicotianae also present in potato in much smaller amounts
 - Similar symptoms to late blight
 - Very poor sporulator even after incubating – can be diagnostic if you're searching and searching for spores
 - Less important of a disease
 - Jean Ristaino in NC can confirm samples
- Spinach Downy Mildew
 - Working on determining races and figuring out source of pathogen
 - Jim Correll in AK can determine races
 - Race 15 in Long Island winter 2017/18
 - Race 12 identified most recently – 2 samples
 - Seed-borne? Get seed from growers if they have outbreaks
- Phytophthora fruit blight – bad year because of weather
- Cucurbit powdery mildew & fungicide resistance
 - Resistance to the following have been recorded:
 - MBC

- QoI
 - SDHI
 - Quintec
 - Torino
 - DMI – reduced sensitivity, not full resistance
- Working on determining fungicide resistance in New England
- Yellow vine decline
 - Brought up as potential issue this past season across several states but was never confirmed
 - Someone in Georgia working on YVD – follow up this winter to see what they’re working on. Look up name.

Heather Faubert – Rhode Island

- RI very dry this year
- Suspected ozone injury – June – basil, beans, cucurbits – affecting older growth, plants grew out of it, widespread
 - Maybe just sunburn after many cloudy days?
- Chive rust - July
 - Can affect leeks, chives, shallots too
 - Seen on garlic in NY also
 - Alternate host is willow species
 - Rob Wick, Angie Madeiras, Rick Raid working on writing Compendium of Diseases and Pests of Herbs – send photos?
- Broad mites on pepper
 - Seeing more every year
 - George Hamilton – lots in 2017, 2018 less
 - Starts from greenhouse that had flowers in it?
 - Dan Gilrein, Cornell – good resource for mites
- CPB in tomato – damage on fruit
- Brown leaf spots on watermelon – found some downy mildew but seemingly not enough to explain extent of spotting. But DM doesn’t sporulate well on watermelon.
- Fusarium on pumpkin
 - Meg sees mostly in u-pick fields where they’re not rotated. Also crown rots.

Caleb Goossen– MOFGA

- Very dry
- One case of dodder on eggplant transplants – don’t know where it was coming from
- Garlic loss from drying garlic directly on black mat in greenhouse with no shade cloth
- Stemphylium on overwintered Walla-Walla onions in high tunnel
 - Not a huge problem in the tunnel but acted as inoculum source for nearby field onions
- Onion DM
 - Also seen in MA, in VT every year
- Celery anthracnose – no diagnostic lab confirmation
 - Variety not known
 - Seen a lot in Tango
- Husk cherry mystery - White rust?
- Lots of PM and leaf mold in tunnels
 - PM coming on tomato transplants
 - UVM high tunnels – starting from seed, high tunnels cold over winter so not endemic, coming from weed hosts?

Alicyn Smart – UMaine Diagnostics

- New lab – entomology, plant path, animal necropsies, fish research, all in one building
- Entry way for meeting with public

- Separate lab for quick microscopy with growers
- Walk-in cooler and freezer
- Center corridor with restricted access
- PCR room
 - Hired molecular diagnostician
 - Does PCR testing for whole building (animals, plant, etc)
 - Can test for phytoplasmas etc, which wasn't possible before
- Set up to do hypersensitivity testing
- Will be testing 2019 for bloat nematode – also testing at Cornell and UMass
- 700 samples between Alicyn & 1 undergrad
- Cylindrocarpon on carrot – storage rot
 - Black sunken rot
- Unknown onion rot – got pure cultures originally but couldn't get hypersensitivity response
 - 3 samples total over the season
 - Check with Beth Gugino, Penn State
- Alicyn shares potato diagnostics with 1 other location
- Saw fair amount of ozone damage on potatoes – more last year

Shuresh Ghimire – UConn

- Replaced Jude Boucher
- From Washington State University
- PhD - biodegradable plastic mulch for vegetable production
- Weather conditions difficult this year – normal until mid-July then heat and heavy rain while peppers, cucurbits, eggplant were flowering
 - Growers asking for tools for weather predictions
 - ClimateHub out of UNH?
- SVB, Cuke anthracnose, thrips, PLH, CPB, tomato blossom end rot in HT
- Cucurbit bacterial wilt
- Carrot weevil
- High heat & nutritional problems in high tunnels – growers irrigating a lot to deal with heat
 - Becky Madden, UVM – high tunnel irrigation survey showed that in general, growers have no idea what they're doing with irrigation and nutrition in tunnels. Most growers do not measure irrigation.
- Tomato cracking with rain
- Bacterial leaf spot in tomato – with high heat and humidity
- Damping off in celery in the field traced back to infected greenhouse plugs
- Cercospora in beet/chard
- Black rot in cauliflower
- FAW in corn
- Plectosporium
- Aphid & whitefly in flowers
- Sclerotinia rot in stored winter squash
- Cucurbit downy mildew arrived mid-August

Angie Madeiras – UMass Diagnostics

- Super wet in western MA, very dry in eastern MA
- Basil DM on Amazel basil – supposed to be resistant – 1st week August, Shrewsbury MA, in planter
 - Rick Raid saw in FL on Amazel
 - Li Jun Ma & Kelly Allen from UMass are genotyping DM isolates
 - 'Prospera' new resistant Israeli variety – Johnny's will likely carry soon
 - Rutgers varieties are holding up better than previous generation of resistant varieties – not 100% resistant
- Hollow heart in potatoes & carrots

- Boron levels were ok but maybe became deficient with rain
- No pathogens found
- Also seen in UVM but from dryer locations
- Olivia Saunders, UNH – seen in rutabaga, but more obviously boron
- Root knot nematode in high tunnel tomatoes
 - Becoming more of an issue in high tunnels that aren't rotated
 - Root knot resistant root stock varieties exist but is NOT resistant to our species of *Meloidogyne* – growers often confused
- Rob Wick, UMass hoping to put on nematode ID workshop next year for diagnosticians
 - Send nematode issues/questions/stories his way

Katie Campbell-Nelson, UMass

- Dry spring, wet fall
- 200% normal precipitation Sep-Nov
- Nov 2018 edition of Veg Notes with climate change info
 - More heavy rain events coming in MA within 80 years
 - 10-20% chance snow in Dec-Feb
 - MA in Zone 7A within 20 years (Zone 5-6 now)
 - Scott Merrill, UVM working on tweaking pest models with climate change on west coast – might know of folks doing similar work on east coast
- Diseases
 - *P. capsici* widespread in Aug
 - Spinach DM – 1st sample collected last week
 - Priorities from growers:
 - Basil DM
 - Tomato bacterial diseases – field and tunnel – canker, spot, speck
 - Some growers trying to deal with it but not effective if everyone isn't doing it
 - Tomato high tunnel leaf diseases (powdery mildew, leaf mold, botrytis)
 - Lettuce DM in winter with increased production
 - Complicated system, lots of unknowns
 - Novel races in New England
- Insects
 - Allium leaf miner in Berkshire Co. (close to NY) in spring but not fall
 - Moving from PA, NY
 - Beet/spinach leafminer – overlapping generations year round
 - Brassica flea beetle – spring population was very strong this year
 - Sue Scheufele doing research looking at various mulches for flea beetle control
 - Corn earworm – highest populations since 2012
 - Cabbage aphid in Brussels sprouts – arriving earlier and earlier? Not so bad this year, very bad last year
- Other
 - High tunnel fertility – especially for winter greens
 - Weed management in fall direct seeded fall crops
 - Mechanical/organic control of weeds in general – no weed specialist in MA
 - Solar power and agriculture – new incentives, confusing
 - Birds/mammals
 - Hemp/cannabis?
 - Climate change
- Katie leaving next year, hopefully Sue Scheufele will replace as team leader, Genevieve Higgins new educator and will hire another educator

George Hamilton – UNH

- Squirrels & chipmunks crazy this year
- Lots of problems with flocking birds in sweet corn

- Spoke to fish & game and wildlife services (growers asking wildlife services to apply restricted use products. Growers not allowed to apply themselves.)
- 2016-17 high mast year → high populations
 - No mast crop this year → pests into crops
- Drought until mid-July
 - By the end of the summer, 15-20 inches more than normal
 - Daily low temps were relatively high, resulting in higher daytime temps too
- Grass thrips – saw for the first time this year. 3 farms this year.
 - Seen a lot in NY – superficial
- European corn borer – 2nd generation highest in NH in 5 years, primarily NY strain

Dave Handley– Maine

- Corn earworm trending downward for 10 years
- Fall armyworm trending upward
- Significant resistance in GM corn – NH too?
- European corn borer – slightly higher 2nd gen, but peaks becoming less intense (pattern over last 10-20 years)
 - Showing up in hops
 - Races becoming less distinctive
- Western bean cutworm – started trapping 5 years ago
 - Just starting to appear in sweet corn
- Northern corn leaf blight – bad last year, not as bad this year. Growers stopped growing resistant varieties but need to keep with it.
- Brown marmorated stink bug – becoming more established. On apple, not on corn yet.
- Deer a big issue in corn, squirrels in winter squash & pumpkins
- Leek moth in western ME – 3 years running

Vermont

- Scott Lewin – Leek Moth
 - 4th year monitoring
 - Only a problem for organic growers because conventional growers can control with systemic products
 - Present in northern ME, 1 county in NH, 12/14 VT counties, lots of north and central counties of NY – overall moving south and east, 30 miles/year
 - Working with Quebec company releasing *Trichogramma brassicae* – trialed last year for first time
 - Successful control in garlic in Ontario
 - Study looking at fresh onions – leek moth damage associated with larger onion. Maybe not an issue if not storing onions
 - Study looking at topping onions in field before curing – not clear whether this is a viable option or not
 - 3 flights/year – saw scallions with leek moth damage in December, implying 4th flight? Not sure where from
- Future/current projects:
 - Wireworms in root crops – problem especially with grass cover crops
 - Colorado potato beetle project – looking at fungus & nematodes for control
 - Spinach leafminer and cabbage aphid seems to be getting worse year after year
 - Swede midge and Brussels sprouts and kale – trials this year but low pest pressure
 - Cover crops – concerns around brassica cover crops harboring brassica pests and grass cover crops and wireworm
 - Potential/actual costs/benefits
 - Surveying growers
 - USDA Plant materials center – Big Flats
- Becky Madden
 - Cabbage aphid – repeated concern – especially on fall Brussels sprouts

- Sue Scheufele, Becky Sideman, Anna Wallingford, Anna LeGrand, Dan Gilrein working on grant looking at insect pests of brassicas
- Looking for more grower collaborators this coming season
- Becky Sideman – survey of VT/NH/ME growers indicates increasing cabbage aphid problem. Many organic growers just spraying 1-2x/season which is not enough. No cabbage aphid pressure on research farm for past 2 years – associated with wet falls → 2 different entomopathic fungi.
- Becky Madden – importance of getting growers to invest in backpack sprayers to be able to spray (same with powdery mildew)
- Black rot – lots this year because of rain
- Squirrels
- Swede midge and leek moth – constant stress even if pest aren't present yet because of unknown controls
- Powdery mildew on tunnel tomatoes
 - Growers using sulfur-stylect oil rotations with some success
 - Sense is that it's coming in on transplants – traced back to one provider in many cases?
- Phytophthora in rainy areas in August

Comments relayed from Margaret Skinner: Failure of *Aphidius ervi* – used against potato aphid. Looking for potato aphids

Comments relayed by Chris Callahan: interested in long-term storage crop challenges and postharvest pathology issues

- Starting winter squash curing trials next year
 - Connect with Brent Loy so he doesn't repeat research?
 - Becky Sideman will share Brent Loy publications
 - Currently lots of "ideal situation" advice out there but many growers can't do that
 - Demo of idea storage situations with existing structures
 - Economic investments of building new structures and what is worth it/not

Ann Hazelrigg – UVM

- Lots of edema in spring spinach
- Garlic bloat nematode
 - Growers need to be asking seed producers what they're testing their seed for and reject if producer doesn't mention garlic bloat nematode
 - UMaine has standardized process for testing and reporting – 5 bulbs and then producer can publish report when selling
- 3 lined potato beetle
- Squash vine borer
- Tomato – black dot root rot – *Colletotrichum*
 - A problem that appears after growing tomatoes without rotating or using root stock
- Heat and fluctuating moisture this year – blossom end rot, sunscald, pollination
- Boron deficiency + heat stress: take home – if fields are borderline deficient in boron and in sandy soil or expecting a rough year, environmentally, go ahead and apply

PRIORITY SETTING:

Education

- Weed management
- Sprayers: calibration and equipment
- Pollinators
- Recordkeeping
- Soil health
- Food safety
- Pest ID & management
- Resistance management
- Organic pesticides (fungi/bacteria/insect)
- Wildlife management
- No till
- Crop nutrition: foliar & traditional
- BMPs for beneficials
- Pest management in high tunnels
- Irrigation
- Innovative new crops
- Business management
- Utility building & structures
- Marketing
- Variety recommendations
- Biofumigants
- Neonic replacements and consumer education

Research

- Variety testing
- Biodegradable
- Late blight – especially organic
- Basil Downy Mildew
- Cabbage aphid
- Birds in sweet corn
- Bacterial disease management
- Efficacy trials: organic & conventional
- Steam sterilization
- Irrigation water quality – food safety
- Cucurbit downy mildew control
- Cover cropping/mulching between beds
- Bee-safe pesticides
- Minimum/No-Till organic production, including collateral damage
- Cover cropping for disease suppression (*P. capsici*)
- Climate change prediction models (verification)
- Extended season pests/problems
- Climate change adaptation tools
- Variety testing
- Biodegradable mulch
- Sprayer technology
- High tunnel environment management
- Soil fertility
- Postharvest storage

- Organic weed management
- Disease resistant spinach varieties
- Labor management (including obtaining and retaining labor, language barriers)

Models

- Squash vine borer
- Leafminers
- European corn borer
- Leek moth
- Flea beetle
- Maggots – Dan Gilrein?
- Pollen

Regulatory

- Nutrient management (MA, VT, specific counties)
- Worker protection
- Food safety education
- Solar and ag
- Labor (sourcing, regulation)
- Hemp
- Wildlife
- Pollinators
- Obtaining uniform pesticide labeling regional-wide
- 18e (emergency registrations)
- Pesticide packaging – bring to manufacturers, survey to document economics

Professional Development

- Farm business management
- Weed specialist
- Vegetable entomologist
- Soil lab director
- Food safety
- Postharvest specialist
- Marketing & development staff
- Nematode identification
- Tomato disease workshop
- Resource sharing
- Soil health testing
- Shared protocols
- Meetings like this
- Evaluation

Specific pests that came up many times across multiple states:

- Powdery mildew in high tunnel tomatoes
- Nutrition and irrigation in high tunnels
- Cabbage aphid
- Swede midge
- Leek moth
- Squirrels