In Sustane without VCE, and 4 with VCE. In noninoculated plants, the vermicompost extract resulted in larger plants no matter which fertilizer was used and generally slowed, but did not prevent, disease development in all three fertilizer treatments in both experiments—but this was not always a significant effect. The least disease was seen with 15-5-15 + VCE fertilization in the first trial, and with 20-20-20 + VCE fertilization in the second. Further experimentation with lower inoculum levels is indicated in order to better observe the interactions between fertilizer and Fusarium wilt in basil.

Grapes and Other Fruit

Evaluation of vinifera winegrape varieties and clones

Investigators: Alice Wise and Libby Tarleton
Location: Long Island Horticultural Research and Extension Center research vineyard

A 1.5 acre variety and clone trial is located at LIHREC. The goal of this work is to assess viticultural characteristics and fruit quality for 33 red and white vinifera winegrape varieties. For all bearing vines, the following data was taken: crop weight, cluster number, berry number/cluster, and fruit quality assessments (°Brix, titratable acidity, pH). A full report can be viewed on the grape program website: http://ccesuffolk.org/grape-program.

The 2014 season was slightly cooler than 2013, particularly in July and August. From July through September, the weather was very dry. Despite irrigation, young vines in the research vineyard were stressed, likely exacerbated by the presence of weed cover as we practice under-vine mowing. The research vineyard has been largely free from crown gall until the 2014 season. Two year old vines of Arneis, Moscato Giallo and in particular Vermentino all displayed crown gall at the graft. Some vines had galls extending up the trunk. In >20 years, there has been one vine lost to crown gall in this vineyard.

Renovation of varieties continued with the removal of Arandell, a disease tolerant hybrid. All Arandell vines had leaf roll virus. Vine health, yield and fruit quality were all suffering. Thanks to testing services provided by Cornell virologists Marc Fuchs and Keith Perry, leaf roll virus was also confirmed in Merlot and Albariño.

A cold hardy Minnesota hybrid, Petite Pearl, was planted in 2014. It is reportedly resistant to powdery mildew, downy mildew, black rot and bunch rot. Unlike many other hybrid reds, acids are moderate at harvest. It reportedly ripens well even in cool summers.

Thanks to the sunny dry weather, canopy and cluster diseases that are problematic with wet weather were largely absent in 2014. Fruit quality was again excellent in 2014. It is rewarding to have two good seasons in a row.

Innovative under trellis management in vineyards: under vine mowing

Investigators: Alice Wise, Libby Tarleton and Justine Vanden Heuvel, Cornell
Location: LIHREC vineyard cv. Merlot

Conventional viticultural wisdom dictates that significant weed growth in the area under vines provides competition for water and nutrients. Consequently, herbicides have long been used as a cost-effective way to maintain a weed free strip under vines. However, under this regime, excessive vine vigor is often an issue for winegrape varieties. This forces vineyards to repeatedly
hedge excessive shoot growth during the summer. Growers are interested in alternative under
vine strategies to both manage vigor and reduce overall pesticide use. In 2008, a tractor
mounted under trellis mower was purchased from Edwards Equipment Co., Yakima, WA.
Replicated treatments were located in a block of Merlot: mowing only, glyphosate only,
mowing with a single glyphosate in late June and mowing with a single glyphosate in late July.
Weed cover and species were evaluated monthly. Repeated mowing promoted the development
of rabbit’s foot and white clover followed by perennial grasses, particularly crabgrass. Yield
components – crop weight and cluster number per vine, average berry number per cluster - were
collected and fruit quality – Brix, TA, pH - was assessed at harvest. The treatments did not have
any impact on yield or quality; this has been the case each of the last seven years. This is
surprising as we anticipated that berry set and/or berry size would be reduced by the presence of
green cover. Where green cover is maintained through July (T.1 & 4), vine size has been
consistently reduced compared to glyphosate treated plots. However, shoot length and shoot
diameter are identical among treatments. We believe the difference in pruning weight is due to
late season growth of lateral shoots as this is visually evident. It is difficult to capture that data
because hedging of green shoots also removes laterals (leaving vines unhedged would create a
disease management nightmare). In spring 2013, lysimeters were installed as a means of
monitoring nitrate leaching. There is evidence from trials in upstate NY and Europe that the
presence of green cover under vines reduces leaching of nitrates and pesticides. Though
performance of lysimeters was inconsistent (no samples forthcoming due to drought
conditions), trends indicated higher nitrate levels in T.2 – season long glyphosate plots
compared to mowing only or mowing with a single glyphosate. A full report can be viewed on
the grape program website: [http://ccesuffolk.org/grape-program/](http://ccesuffolk.org/grape-program/).

Innovative under trellis management in vineyards: under vine cover crops

Investigators: Alice Wise, Libby Tarleton and Justine Vanden Heuvel, Cornell

Location: a Long Island commercial vineyard cv. Syrah

As a complement to the under vine mowing trial, an under vine cover crop trial was seeded in
spring 2011. To prepare plots for seeding, glyphosate was applied to eliminate existing weeds.
Plots were then hand-hoed, a lengthy and challenging effort as the ground was quite compact.
No Mow fescue (a proprietary mix) and Dutch white clover were seeded by hand. A treatment
with a No Mow/clover mix resulted in total dominance by the clover. Glyphosate treated plots
served as the grower standard treatment. Yield components – crop weight and cluster number
per vine, average berry number per cluster - were collected and fruit quality – Brix, TA, pH -
was assessed at harvest. As with the mowing trial, treatments did not have any impact on yield
or quality. However, the No Mow fescue significantly reduced vine size as defined by pruning
weights. Pruning weights in clover plots were not significantly different from those in
glyphosate plots. Petioles collected for nutrient analysis revealed that vine nitrogen status was
lower in fescue plots, consistent with past results. In spring 2013, we installed lysimeters as a
means of monitoring nitrate leaching. There is evidence from trials in upstate NY and Europe
that the presence of green cover under vines reduces leaching of nitrates and pesticides. As with
the mowing trial, lysimeter results were inconsistent in part due to a lack of available samples
during the drought. On several dates late in the year, we observed higher nitrate levels in the
two plots with clover. A full report can be viewed on the grape program website:
[http://ccesuffolk.org/grape-program/](http://ccesuffolk.org/grape-program/).
Strategies for control of sour rot in vinifera winegrapes
Investigators: Alice Wise, Libby Tarleton and Wayne Wilcox, Cornell Dept. of Plant Pathology
Location: LIHREC vineyard cv. Chardonnay

Eastern grapegrowers face increasing losses due to sour rot, a disease complex of ripening winegrapes. The incidence and severity of sour rot is linked to high relative humidity as well as frequent and/or heavy rainfall in the post-veraison period. Tight clustered white and red varieties such as Chardonnay, Sauvignon Blanc and Pinot Noir are the most vulnerable. Sour rot is difficult to manage as currently there are few chemical or cultural options for control. Sour rot is often accompanied by fruit flies, possible vectors for the disease that contaminate fruit and make for unpleasant harvesting. This project involved treatments to reduce the incidence and severity of sour rot through control of both sour rot and fruit flies. The experiment was located in a block of Chardonnay within the LIHREC vineyard. A split plot design was utilized with half the plots treated with insecticide (Danitol, Valent BioSciences Corp. Walnut Creek, CA) in late August for control of fruit flies. Within each area (with and without insecticide), potassium metabisulfite (KMS) was compared to plots treated with Oxidate (a.i. hydrogen dioxide, BioSafe Systems, Hartford, CT). Due to an extended sunny, dry period July through September, sour rot did not develop in this block. Low levels of Botrytis occurred in the weeks prior to harvest on October 13. Lower levels of Botrytis were found in plots treated with Danitol in late August. This was possibly due to a reduction in late season grape berry moth infestations. Because of the difficulty in detection of grape berry moth in clusters with rot, this project did not definitely address the reason for this finding. KMS was slightly more effective than Oxidate in control of Botrytis. Overall, Botrytis infections were very low. It is unclear if these results will translate to years with higher disease pressure. Currently, KMS is not labeled for use as a pesticide. Hopefully these types of results will precipitate registration of this material in the future. A full report can be viewed on the grape program website: http://ccesuffolk.org/grape-program/.

Control of cluster rot diseases: early cluster zone leafing to loosen clusters and reduce cluster rot
Investigators: Alice Wise and Libby Tarleton
Location: Long Island vineyards and LIHREC vineyard

Due to high relative humidity and frequent rainfall in the postveraison time period, cluster rot is problematic in eastern vineyards. In varieties such as Chardonnay, Sauvignon Blanc and Pinot Noir, cluster rot leads to reductions in yield, as much as 50%. Expenses also escalate as growers must sort diseased fruit prior to processing. Cluster zone leaf removal, removal of 2-4 leaves/shoot around clusters, is a standard practice in eastern US vinifera vineyards. It promotes light penetration and airflow, promoting quality and reducing disease pressure. The traditional timing for removing cluster zone leaves takes place at or after berries have set. Early leaf removal, the removal of 6-8 basal leaves prebloom, has been shown in studies to reduce berry set due to a decrease in carbohydrate availability. Pre-bloom cluster zone leaf removal results in looser clusters that are much less susceptible to various types of cluster rot.
To gain experience with early leaf removal, both demonstration trials and a replicated research project were implemented. In the demonstration plots, 6 basal leaves were removed immediately prebloom in Pinot Noir and Chardonnay. There was a treatment effect in some blocks but not all. In the research project, leaves were removed one week prebloom, 3 days prebloom, trace bloom and post bloom. Cluster weight, berries/cluster, rachis length and berries/cm rachis were all reduced by early leaf removal treatments. 

Botrytis severity was also reduced in these treatments. Because this is a labor intensive, expensive practice to implement by hand, European growers are starting to mechanize this practice. A full report can be viewed on the grape program website: [http://ccesuffolk.org/grape-program/](http://ccesuffolk.org/grape-program/).

**Control of cluster rot diseases: trials with Botector and Triggrr**

**Investigators:** Alice Wise, Libby Tarleton and Wayne Wilcox, Cornell Dept. of Plant Pathology  
**Location:** Long Island vineyard cv. Chardonnay

*Botrytis* bunch rot is a disease of grapes most common in temperate climates with growing season rainfall such as the eastern US. The *Botrytis cinerea* fungus infects cluster debris (calyptras, stamens, aborted berries) and then remains latent. When ripening begins, known in viticulture as veraison, the fungus can resume growth if environmental conditions are favorable. Frequent rainfall favors secondary infections of other fungi, yeasts and bacteria, hence the term ‘*Botrytis* bunch rot’. Yield losses result from moderate to severe bunch rot infections. Sorting of diseased clusters prior to processing is increasingly common, a significant additional cost at harvest. Control of *Botrytis* is achieved through both cultural practices and botrycides. The botrycide Botector, *Aureobasidium pullans* (Westbridge Agricultural Products, Vista, CA), was evaluated in a Long Island Chardonnay vineyard. This product appeals to growers due to its status as an organically approved fungicide. Four treatment regimens were evaluated: one with season-long Botector and three others with combinations of Botector and conventional botrycides. Disease levels in all plots were similar, likely due to an extended drought July through September. *Botrytis* incidence was approximately 50% in all treatments. There was a slight statistical difference in severity though with all treatments ranging from 2-4% severity, there is no practical importance to this finding. Botector was used on a limited basis by commercial growers. Several felt that it helped to limit *Botrytis* development. A full report can be viewed on the grape program website: [http://ccesuffolk.org/grape-program](http://ccesuffolk.org/grape-program).

Triggrr is an organically approved liquid soil and foliar nutrient from Westbridge Agricultural Products, Vista, CA ([www.westbridge.com](http://www.westbridge.com)). It is a proprietary blend of seaweed, plant extracts and fermentation products. The formulation consists of 1.0% soluble potash (K20) and 0.45% humic acid. Triggrr is recommended for use on a number of fruits and vegetables. For grapes, the benefits listed by Westbridge include improved flowering and flower set; decreased flower shatter; improved fruit uniformity, color and quality; increased [rachis] stretch for reduced berry rot; and increased sugar content (brix). Local winegrowers are particularly interested in techniques which reduce cluster compactness, thereby reducing susceptibility to cluster rot. Two regimens of foliar Triggrr were compared to untreated vines. Triggrr was applied 7 times through the course of the season with slightly different application rates for the two treatment regimens. There were no significant differences in cluster weight, berries/cluster or rachis length in either treatment. Cluster rot did not occur in this block in 2014. It has been suggested
that application of Triggr in tandem with certain foliar nutrients may lead to the desired rachis-stretching effect. A full report can be viewed on the grape program website: http://ccesuffolk.org/grape-program/.

2014 Grape commodity survey

Investigators: Alice Wise and Libby Tarleton
Location: Long Island vineyards

The 2014 grape commodity survey was conducted in conjunction with Cornell Cooperative Extension's NYS IPM Program and Grape Programs in the main growing regions of New York State; Lake Erie, Finger Lakes, Long Island and the Hudson Valley. Both commercial vineyards and grapevine nurseries were included in the study. This work was sponsored by NYS Dept of Agriculture & Markets. Pheromone traps were deployed for several exotic moth pests - European grape vine moth, European grape berry moth, Egyptian cotton leafworm and summer fruit tortrix. These are found in several west coast grape growing regions. They have the potential to cause widespread damage, leading to potential reductions in yield and quality of winegrapes. One or more sets of traps were placed in each of five vineyards. Traps were checked every other week late June through October. Fortunately, the intended targets were not found in Long Island traps or in traps placed throughout upstate NY. Vineyards were also scouted for Australian grapevine yellows disease, a phytoplasma (simple bacteria) that can infect grapevines in particular Riesling and Chardonnay. It can cause restricted growth in the spring as well as late season leaf curl and berry shrivel. There was no evidence of grapevine yellows infections. Vineyards were also sampled for leaf roll and red blotch virus. A number of vineyards tested positive for one or both. Both of these viruses manifest differently in different vineyards/varieties but in general, they cause a reduction in quality and quantity of fruit.

Veraison to Harvest newsletter coverage of fruit ripening in New York

Investigators: Alice Wise, Libby Tarleton, Tim Martinson and extension associates throughout NY
Location: Long Island vineyards

Veraison marks the point in time that winegrowers consider the beginning of the ripening period. Berries develop color, soften, lose acids and develop sugar, flavors and aromas. The progression of ripening is important to monitor and compare to previous seasons. This facilitates planning for both harvest and winemaking activities. Extension personnel statewide sampled fruit from commercial vineyards at weekly intervals. Six blocks were sampled in two different North Fork vineyards. Each region forwarded juice samples to the wine analytical lab at Geneva for analysis of sugar, acid, pH, tartaric, malic, citric and acetic acids. In addition to juice analysis results, extension personnel from each region composed weekly articles describing fruit quality, varieties being harvested, issues facing vineyard managers and so on. The analytical results and regional blurbs were compiled in a weekly newsletter to growers, distributed electronically by State Viticulturist Tim Martinson. Timely technical articles from research and extension personnel were also included where appropriate. While this work does not supplant the need to thoroughly understand and monitor one’s own vineyard, it provides a useful point of reference for winegrowers. To access Veraison to Harvest newsletters: http://grapesandwine.cals.cornell.edu/veraison-to-harvest/.
Educational and extension programs for the wine industry
Investigators: Alice Wise and Libby Tarleton
Location: varied by meeting

The following meetings were held for the wine industry in 2014:

- **January** – LI Agricultural Forum Viticulture session featured Marc Fuchs (grapevine virus diseases), Faruque Zaman (spotted wing drosophila and other fruit flies) and Tim Weigle, Grape IPM specialist who spoke on weather stations and disease prediction programs.
- **February** – Members of the LI Sustainable Winegrowing (LISW) group shared their compost-making strategies.
- **March** – Alice Wise presented talk to growers on cluster rot and under vine mowing/COVERS; a webcast was held late month featuring Cornell pathologist Wayne Wilcox and entomologist Greg Loeb.
- **April** – A webcast was hosted featuring viticulturists Justine Vanden Heuvel (Cornell) and Tony Wolf (Virginia Tech) on under vine management with cover crops. Along with the LISW, we hosted a soil workshop featuring Dan Kittredge of the Bionutrient Food Association.
- **June** – Hosted along with LISW, Matt Hoffman, technical director of the Lodi Rules sustainable viticulture program, discussed protocols and management with local growers.
- **August** – Hosted along with LISW, Ontario viticulturist Kevin Kerr visited local growers and discussed research updates.
- **September** – Growers toured the research vineyard during Plant Science Day.
- **October** – Students from a Cornell viticulture class toured the research vineyard.
- **December** – Hosted along with LISW, geologist and soil scientist Dr. Joseph Zachmann reviewed LISW protocols and provided insights for future program management.

Evaluation of Movento for control of grape mealybug in vineyards
Investigator(s): Faruque Zaman, Daniel Gilrein and Alice Wise
Location: Participating Long Island vineyard

Foliar applications of Movento (spirotetramat 2F, Bayer CropScience) insecticide were compared for controlling grape mealybug (*Pseudococcus maritimus*) in “Merlot” grapes in Cutchogue, NY. Treatments tested included Movento applied once at 6.0 oz/A pre-bloom and one application pre-bloom followed by a second application at the same rate after 30 days. Unsprayed plants were used as a control. Adjuvant PAS-800 (phosphatidylcholine, methylacetic acid and alkyl polyoxyethylene ether, 80%, Drexel) at 8.0 oz/100gal was included with the treatments as a spreader/penetrant. The trial was conducted from May to September 2014 in a 3-acre 15-year-old block. Three treatments were randomly assigned to a 300’ double-row planting in a completely randomized design. There were 4 replications for each treatment (2 rows/replication, total 8 rows each 300’). Prior to treatment application, from May 28 – June 3, immature mealybugs (mostly 1st and 2nd instar) populations were counted by checking 25 spurs randomly selected from each row. The first round of treatments was applied on July 2 at pre-
bloom stage and a second Movento application (for the portion receiving it) was made on August 5. Treatments were applied at 60 GPA water volume in an over-the-row LIPCO vineyard recycling sprayer operating at approximately 150 psi. Treatment effectiveness was evaluated first on July 28 by counting live mealybugs from 15 randomly selected 8 – 12-inch sections of shoots and adjacent grape clusters from each row. A second evaluation was made on September 23 following the same procedure. Mealybug populations were very low (avg. 0.31/spur) at the spring pre-treatment count. It was expected that populations would further increase in late summer when treatment effects might be more apparent. However, mealybugs were not found even in control blocks in late-season counts so we are unable to make any conclusions concerning efficacy of the treatments. We plan to collect data from the trial area in spring, 2015. No phytotoxicity was seen in any of the treatments.

Year-round monitoring of spotted wing drosophila on eastern Long Island - 2014

Investigator(s): Faruque Zaman, Nolan Amon and Daniel Gilrein

Location: Participating Long Island fruit farms and LIHREC

Spotted wing drosophila (SWD) populations were monitored in the eastern Suffolk’s small fruit farms and vineyards in 2014. Adult SWD were monitored using apple cider vinegar and yeast+sugar-based fermentation bait traps in several commercial crop fields and adjacent forest areas particularly those with nearby wild hosts (trees, shrubs, and herbaceous perennials) producing soft-skinned fruit. Commercial plantings included raspberry, blackberry, blueberry, and grape, where two traps were deployed in each of six farms for a total of 12 traps. Traps were also deployed approximately 30m away in nearby forest areas and inside crop fields. Traps were checked and serviced approximately once per week from January 1 to December 31.

First SWD capture occurred around mid-July (approx. 1250 GDD from Jan 1) in raspberries, about 4 weeks later than the 1st catch in 2013 (approx. 650 GDD from Jan 1). SWD numbers in all traps remained low (5 – 30 flies/trap/week) until end of the growing season (late October); numbers increased sharply from early November through late December, ranging between several hundred to several thousand per trap per week depending on location. From observations in 2011 to 2014 the proportions of SWD in traps vs non-pest species ranged from 0 to 25% during late summer to early fall, but increased dramatically in late fall, to 40 – 95%. Consistent over the past three years, the sex ratio (male:female) of SWD in traps remained around 50:50 during most of the season. SWD numbers in traps dropped off with onset of cold weather in mid-November. Very high trap counts in mid-fall may be related to both the very high population present, the attraction of protected forest areas for possible overwintering sites, and the absence of hosts. Monitoring of SWD first appearance and numbers in host crops and the adjacent landscape helps small fruit growers and vineyard managers make timely management decisions.

This work was funded by the Friends of Long Island Horticulture.
Impact of spotted wing drosophila on Long Island small fruits
Investigator(s): Faruque Zaman, Nolan Amon, and Daniel Gilrein
Location: Participating Long Island fruit farms

Direct fruit damage by SWD to various commercial fruits was assessed in 2014 at eastern Long Island berry fruit farms and vineyards. From July to October, 54 four-ounce ripe or nearly ripe fruit samples were collected periodically from cultivated crops (12 raspberries, 12 blackberries, 6 blueberries, and 24 grapes). Fruit selected was apparently intact without obvious evidence of damage or infestation and immediately placed in rearing containers held inside screen cages to exclude other fruit flies and insects. A yellow sticky card attached inside the rearing container was used to capture emerging adults. Fruits were held in rearing cages for 14 days at room temperature (69 - 72F), after which trapped flies were checked and all SWD were counted. A portion of collected fruit was also inspected under the microscope for the presence of characteristic breathing tubes extending from eggs laid beneath the surface. Insecticides were not being applied to these crops for SWD.

Raspberry and blackberry SWD infestation was moderate in 2014 compared to severe levels observed in 2012 – 13. Raspberry fruit infestation levels rose from about 8% in mid-July to 27% in August and 59% by September. Blackberries followed a similar pattern, increasing from 25% in July to 39% in mid-August and nearly 60% thereafter. Blueberries were little affected (<7% damage) by SWD due to its late appearance this year. Nearly all blueberries were harvested by early August before SWD populations became high in the area. Based upon three years of SWD population and fruit damage monitoring, summer raspberries, blackberries and blueberries ripening around late July or early August onwards appear to be at significant risk of SWD infestation. SWD infestation in grape was very limited and only seen in red grapes, mostly in border rows and at lower level (<1.5%) than in 2013 (~2.5%). Similar to last year, we did not find any infestation in ‘Chardonnay’ in 2014. SWD damage to cherries was not noticed in Long Island orchards because of early ripening and harvest, before SWD appeared in the region. We expect SWD will not be a significant problem for cherries unless population shifts their emergence or appearance much earlier in the season.

This work was funded by the Friends of Long Island Horticulture.

Assessment of spotted wing drosophila impacts in grapes growing adjacent to forest borders and within vineyards.
Investigator(s): Faruque Zaman and Daniel Gilrein
Location: Participating Long Island vineyards

Grape infestation from spotted wing drosophila (SWD) was assessed from locations adjacent to and further away from where SWD wild host plants were growing in forest borders along commercial vineyard. Four locations were selected from two vineyards with “Merlot” grape rows adjacent to the forest borders with pokeweed, bittersweet nightshade, and black cherry. Mature grape samples were collected from each of the three sites along a transect running from the border to inside vineyard: (a) 1st and 2nd rows adjacent to forest border, (b) 7th – 8th rows from the border, (c) 15th and 16th rows from the border. Sample collections were repeated three times from the second week of September to mid-October. A total of 108 samples were
collected for the entire assessment period (3 samples/site, 15 berries/sample, 36 samples/location). Grapes collected were apparently intact without visible damage or other infestation and immediately checked under the microscope for evidence of SWD oviposition. Regardless of location, no SWD oviposition (egg laying) was observed on fruits collected in September. However, in mid-October a low level of SWD infestation (4.0% berries) was found in samples collected closest to forest borders. No SWD oviposition was found in grapes collected from 7th - 8th or 15th - 16th rows. Although this assessment was done in two vineyards, from observations in other vineyards it should be noted that overall grape infestation from SWD was very low (<2.0) and appears to be almost entirely limited to border rows very close to harvest. So we believe this level of damage has very minimal impact, if any, on fruit or wine quality. It is clear that grape is significantly less preferred over other kinds of small fruit and lack of more preferred hosts in fall together with the very high SWD populations present might explain the limited infestation in grapes. We did note low levels of common fruit fly, Drosophila melanogaster, eggs on some varieties. Favorable conditions (rainfall, disease etc.) with some associated fruit deterioration in 2014 might be responsible for low D. melanogaster populations. It is not clear what impact, if any, this insect is actually having. SWD monitoring and damage assessment in grapes should continue in 2015, to assess the consistency of our observations given normal variations in weather, crop condition and SWD population levels from year to year.

This work was funded by the Friends of Long Island Horticulture.

Implementation of an area-wide insect mating disruption participatory program in Long Island tree fruit orchards – 2014

Investigator(s): Faruque Zaman, Laura McBride and Daniel Gilrein

Location: Participating Long Island tree fruit farms

Long Island has approximately 324 acres of tree fruit managed by 14 growers. Codling moth (CM), oriental fruit moth (OFM), and peachtree borers (PTB) are major pests for tree fruit production on Long Island. With funding by the USDA Specialty Crops Block Grant Program (sponsored by NYS Department of Agriculture and Markets), about 70% (242 acres) of the Long Island tree fruit acreage has brought under some form of insect mating disruption for controlling major insect damage. This project engaged and motivated L.I. tree fruit growers to expand the use of non-insecticidal and environmentally friendly mating disruption techniques through 40% cost-sharing and technical support for the 2014 and 2015 growing seasons. Before the project started, about 15 - 35% tree fruit acreages (60 – 117 acres) were under mating disruption in the past three years, increasing approximately 95% in 2014. Us of mating disruption has enabled participating growers to substantially reduce insecticide applications in their orchards for CM, OFM, and PTB. CM damage was less than 0.5% in orchards using mating disruption, compared to over 15% in one orchard where mating disruption was not used. OFM damage was just 0.21% in apples and 0.15% in peaches in the mating disruption orchards in 2014. However, in the non-mating disruption blocks nearly 1.0% fruit was found with OFM damage. In 2015 our target is to add mating disruption for dogwood borer as well the maximum possible remaining tree fruit acreage depending on pest pressure. Insect populations often vary greatly among location or even in an orchard. About 15% of the tree fruit acreage (about 48 acres, mostly on the South Fork) had minimal OFM/CM levels, so mating disruption was not
economical for these farms in 2014. Another 15% of orchard blocks are not suitable for mating disruption because of their small or fragmented shape.

This work was funded by the USDA Specialty Crops Block Grant Program through NYS Department of Agriculture and Markets.

2014 Long Island tree fruit integrated pest management program
Investigator(s): Faruque Zaman, Daniel Gilrein and Laura McBride
Location: Participating Long Island tree fruit farms

Twelve apple and five peach orchards participated in a tree fruit integrated pest management project in 2014 run by the Agriculture Stewardship Program of Cornell Cooperative Extension, Suffolk County. Growers received season-long weekly pest monitoring and management recommendations with assistance from Entomology staff from CCE-Suffolk County, NYSAES at Geneva, and Cornell University’s Hudson Valley Lab. To assess impact and determine future areas to focus upon. 17,500 apples and 10,500 peaches were inspected for fruit damage throughout the growing season (500 fruits/sample checked from 5 interior and 5 border trees). Plum curculio (PC), codling moth (CM), tarnished plant bug (TPB), European apple sawfly, and oriental fruit moth (OFM) were the most significant insect pests in pome and stone fruits on Long Island. Together these insects were responsible for 4.0% fruit damage.

Consistent with 2011 - 2013 survey results, PC was the most damaging pest on Long Island apples again in 2014. However, the overall PC infestation was much lower in 2014 (<2.0%) compared to the 2011 season (>15%). Early detection by beating tray sampling, visual fruit inspection for characteristic crescent scar, and timely use of insecticides Avaunt and Assail were very effective. Our relatively small orchard size surrounded by long forest borders and multiple cultivars within blocks present challenges for PC control on Long Island farms. TPB damage was low in apples and peaches in 2014 (0.6%) down from 1.28% and 2.04% for apples and peaches, respectively, in 2012. Timely weed management was recommended for reducing TPB damage in fruits. No insecticide application was needed. Stink bug damage was very low, less than 0.15% apples and 0.10% peaches showed some kind of injury (including brown marmorated stink bug [BMSB, Halyomorpha halys], green stink bug, and brown stink bug). Most damage was in exterior rows near forest borders as expected. Similar levels of damage were observed in 2012 and 2013. Damage was not attributed to any particular stink bug species.

Overall, BMSB populations remain very low (1.25 adults/trap/season in apples and peaches, below the 10 adults/trap/season provisional management threshold for peaches set by USDA-BMSB researchers) compared to other mid-Atlantic regions. One BMSB and two green stink bug (Chinavia hilaris) adults were found in apples during the fruit scouting period. Internal lepidoptera (OFM and CM) damage was average 2.28% in apples. There has been an upswing of CM damage in some orchards. Although CM has historically been a minor threat for pome fruit on L.I., there was noticeable damage (<5%) in two locations during late summer and early fall in 2013 increasing (up to 15%) in 2014. Growers are encouraged to include CM when planning mating disruption for the coming year. Cost sharing (40%) through CCE-SC for pheromone ties was provided in 2014 and will be available for the 2015 season. With the reduced use of broad-spectrum insecticides, fruit growers are also advised to be watchful for
emerging (usually minor) pests in the coming years, including dogwood borer, pear psylla, San Jose scale, apple leaf midge, and ambrosia beetle damage in some orchards.

**Efficacy of new pheromone lures for monitoring brown marmorated stink bug**

**Investigator(s):** Faruque Zaman, Daniel Gilrein, Peter Jentsch and Arthur Agnello  
**Location:** Participating Long Island tree fruit farms

Cornell Cooperative Extension of Suffolk County joined with regional collaborators to monitor brown marmorated stink bug (BMSB, *Halyomorpha halys* (Stål)), populations in two fruit orchards using newly developed USDA # 10/20 pheromone lures. 12 traps were set near the forest borders adjacent to a 20-acre peach, a 10-acre apple orchard, and a 25-acre mixed (apple, peach, vegetable, cherries etc.) planting on eastern Long Island, NY. Four treatments were compared using the same pyramid trap type in each case: 1) #10/20 (~10 mg load) + MDT lure (AgBio; 66 mg); (2) Un-baited Control); (3) Commercial lure A; and (4) Commercial lure B. Each treatment was replicated three times (one in each peach, apple and mixed orchard). Traps were set in the field from May 5 to October 2. Traps were checked weekly for BMSB adults or nymphs. USDA # 10/20 lures were changed every 2 weeks and synergists every 4 weeks. Traps baited with #10/20 + MDT pheromone recorded first adult captures on May 12 (peach, Wading River, 135 GDD calculated from Jan. 1). During the entire season 6 male and 3 female BMSB were captured in # 10/20 traps. No BMSB were captured in control traps. About 25 BMSB adults and several nymphs were reported from residential landscapes in the Calverton and Riverhead area. One adult was captured from an apple tree during the fruit survey. The findings suggest this insect is now established and breeding in the eastern part of the Long Island and growers are advised to be watchful in the coming years.

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**Nursery, Landscape & Ornamentals**

**In vitro breeding of Syringa vulgaris, the common lilac**

**Investigators:** Mark Bridgen  
**Location:** Long Island Horticultural Research and Extension Center and Ithaca

The common lilac, *Syringa vulgaris*, is valuable because it is a popular upright, deciduous shrub which is widely grown in the northern United States. Plants grow 8-15’ tall and have sweetly fragrant flowers that are arranged in dense, pyramidal, terminal clusters (panicles) usually flowering on Long Island in mid- to late-May. The flowers that are produced on lilac shrubs have a long postharvest vase life and make excellent fresh cut flowers. Lilacs are a member of the olive family, *Oleaceae*, and have been a garden favorite for many years because of their winter-hardiness in U.S. hardiness zones 3-7.

The objective of this project is to introduce new and improved *Syringa vulgaris* cultivars that have benefit to the American people and commercial ornamental plant industries. Plants of selected somaclones have been planted outside and are being evaluated. The ornamental plant market is eager for new varieties of lilacs and *in vitro* mutagenesis is a major and strong source