Summary of Research/Extension Activities at the Hudson Valley Laboratory 2006-2007

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Summary of Research/Extension Activities at the Hudson Valley Laboratory, 2006-2007

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As scientists at the Hudson Valley Lab, we hope that this document provides a useful overview of our activities over the past two years. Compared to activities that might have predominated 25 years ago, we are spending more time writing grants and extension publications and less time visiting commercial orchards. However, we work closely with our regional extension educators (Mike Fargione, Steve McKay, Kevin Jungerman, Dale Moyer, Debbie Breth, Jay Osborne, Craig Kahlke, and others). We always have time to answer questions from fruit growers, regardless of whether those questions arrive by phone or e-mail or via extension educators or private consultants. We still make farm visits to assess complex problems, set up field trials, and keep abreast of developments in commercial orchards. In fact, we welcome requests for farm visits when unusual situations create new problems or lead to new insights. We hope that you will not hesitate to call us if you have complaints, compliments, new observations, or novel ideas for our program efforts.

The Hudson Valley Lab is a unique research/extension resource for the fruit industry of New York and surrounding states. As scientists, we know that any success that we achieve is largely due to the uniquely integrated support structure that we enjoy thanks to linkages with and support from the local fruit industry, private consultants, agrichemical companies, Cornell University in Ithaca, the N.Y. State Agricultural Experiment Station in Geneva, and Cornell’s extension educators. We also benefit from the dedicated work of a highly skilled group of technicians and support staff.

Thanks again for your support and interest.

Dave Rosenberger, Professor of Plant Pathology and Superintendent of Cornell’s Hudson Valley Lab
Steve Hoying, Senior Extension Associate in Horticulture, Hudson Valley Lab
Peter Jentsch, Extension Associate in Entomology, Hudson Valley Lab
EXECUTIVE SUMMARY

Many changes have occurred at the Hudson Valley Laboratory over the past several years. Steve Hoying and Peter Jentsch were hired as lead scientists for the horticulture and entomology programs, and both of them have initiated new research/extension programs. The plant pathology group has continued programs aimed at finding the best approaches for managing fruit diseases both in the field and after harvest. We have also been able to upgrade our research orchards, farm equipment, laboratories and conference room. This report documents some of these changes and provides an overview of research/extension projects carried out by scientists at the Hudson Valley Lab during 2006 and 2007.

During the past year, Steve Hoying spent time observing the eastern NY fruit industry, conversing with growers, surveying needs, exploring options for new projects, and writing grants needed to fund critical initiatives. Steve is focusing on methods and techniques that can improve fruit quality and thus profitability of the fruit industry. He is researching management approaches that can improve orchard establishment, fruit thinning, and fruit color, finish and size. He also plans to evaluate new rootstocks and varieties. A viticultural component has been added to the horticulture program, thereby broadening the fruit program and bringing access to new funding sources that can strengthen the overall research/extension effort in horticulture. Collaborative efforts with professional staff at the Hudson Valley Lab, NYSAES and main campus in Ithaca are essential to synergize these efforts.

Peter Jentsch has completed some projects that were initiated by Dr. Dick Straub and also initiated new projects. Peter’s program includes a large field evaluation program for new insecticide and acaracides for apples and pears. Trials are conducted both in research orchards and on commercial farms. Peter has also evaluated organic and/or low-spray programs for apples and pears that might be useful for growers targeting niche markets in New York City. In addition to working on tree fruits, Peter is working with local grape growers to evaluate programs for controlling grape berry moth and other grape pests. He has also maintained a field testing program for onion pests on plots in the Orange County black dirt area that are managed by long-time entomology technician Henry Grimsland.

Dave Rosenberger’s program has focused on evaluation of new fungicides and fungicide strategies for controlling apple scab, rust diseases, powdery mildew and summer diseases on apples; black knot on plums, and Fabraea leaf spot on pears. Dave and his technicians are evaluating methods for predicting development of sooty blotch, flyspeck, and summer fruit rots on apples. Dave is also the only pathologist outside of the Pacific Northwest who is actively researching the biology and control of fungal pathogens that cause apple decays during storage, and he cooperates with Dr. Chris Watkins on various postharvest studies.

The Hudson Valley Lab is uniquely equipped and positioned for evaluating pesticide programs on apples and pears. Each year, scientists at the lab run more spray trials on tree fruits than any other research station in the Northeast. In 2007, for example, Jentsch and Rosenberger evaluated more 150 different pesticide treatments in an array of field trials that extended from early spring until late September. A dedicated crew of technicians and seasonal employees looked at thousands of leaves and fruit throughout the growing season to determine which products and application timings provided the best pest control. For example, the plant pathology technicians alone looked at over 85,000 individual leaves and 65,000 fruit in each of the past two years while checking for eight different fungal diseases. Results from these trials are crucial for devising pest control recommendations that are used throughout New York, New England, and other fruit-growing areas.

Scientists at the Hudson Valley Lab use many different approaches to get information to fruit growers and other extension audiences. Over the past two years, the three scientists have given more than 140 oral presentations at various fruit grower and professional meetings. They authored or co-authored nine articles in New York Fruit Quarterly, 83 articles for extension newsletters or other trade publications, and 29 technical reports describing results of field and postharvest fungicide trials. Taken together, HVL scientists have a uniquely integrated program of research and extension activities that provide New York growers with access to state-of-the-art information on fruit production and pest control.
SUMMARY OF HORTICULTURE PROJECTS 2006-07
Steve Hoying, John Hudelson, and Henry Grimsland

1. Orchard Management Systems for Improved Yield & Fruit Quality

   Funding Source: NYS Ag & Markets Apple Research and Development Program (with T. Robinson and M. Fargione)

   Objectives/accomplishments:
   This continuing project seeks to develop and test effective and profitable apple planting systems by establishing research and demonstration orchards on-farm with cooperating growers. The Dressel planting established in 2006 includes 4 planting systems, 11 rootstocks, 2 varieties, and 3 tree qualities. The 1.25 acre replicated Chiaro plantings established in 2007 has 4 planting systems, 10 rootstocks, 1 variety, and 3 tree qualities. We established a trial designed to determine the best training system/rootstock combination for successful Red Delicious orchards. Training systems include Super Spindle, Tall Spindle, Triple Super Spindle, and Vertical Axe. Rootstocks included in the trial are the standards M.7, M.26, M.9, Geneva Rootstocks G.41, G.30, G.935, G.210, and B.118. Establishment costs, yield data, and fruit quality data will continue to be collected for each of these plots for 10 years and the economics of each combination analyzed and compared. Updated information will be provided to fruit growers through the life of these plantings. These sites will be used for Extension demonstrations for pruning, training, management, etc. and other meetings throughout the trial period.

2. Field Testing Apple Rootstocks in the Hudson Valley (Part of Intermediate Stage Evaluation of the Cornell-Geneva Rootstocks and Other Promising Rootstocks from Around the World)

   Funding Source: International Fruit Tree Association, Regional Research Funds (Improving Economic and Environmental Sustainability)

   Objectives/accomplishments:
   A rootstock test block at Crist Farms was established in 2005 by Robinson and Fargione to field-test the performance of candidate apple rootstocks from around the world in the Hudson Valley. Fuji was used as the test variety. The Crist block has 54 test rootstocks from which tree mortality, yield, and fruit size data was taken in the fall of 2007. Several candidates from this list with previous data from WNY have been identified with potential for New York and have been placed on the “watch” list. This trial will continue until 2017. The Doubrava Gala block was established in 2006 and looks specifically at the effect of soil fumigation on the performance of M26, M9Pajam2, G41, M7, G11, CG6210, G30, B9, G4210, G5935, M9NAKB337. Data will continue to be collected for another 8 years.

3. Evaluating new apple varieties for the Hudson Valley

   Funding Source – Various including Hoying startup funds, Brown

   Objectives/accomplishments:
   Fifteen second-test selections of Dr. Susan Brown’s apple varieties were planted on-station in spring 2007 as well as one new strain of McIntosh and another test selection from International Plant management. Six strains of Fuji were grafted into existing trees to compare fruit quality and suitability for the Hudson Valley among these strains. Additional support was provided to Fargione and Maloney for evaluation of on-farm trials in the Hudson Valley. I intend apple variety testing to be an ongoing program using a variety of methods.
4. Testing Return Bloom Treatments for difficult varieties in the Hudson Valley

Funding Source: NYS Ag & Markets Apple Research and Development Program (with T. Robinson and M. Fargione)

Objectives/accomplishments:
Ensuring return bloom and annual cropping is essential for maximizing farm profitability. Some apple varieties such as Honeycrisp and Fuji do not return with good bloom when overcropped the previous season. Previous work has shown the level of cropping of these varieties which will return with bloom. These levels are lower than they might be since other varieties return bloom at higher crop levels the previous season. Currently, standard practice for fruit growers is to use multiple applications of the growth regulators NAA or Ethrel during the growing season to help increase return bloom levels on these difficult varieties. This test is to see if there are other ways NAA and Ethrel can be used at higher rates and various timings to improve return bloom. In 2007, 20 different timing and rate combinations were tested for their effect on tree growth, crop quality, and in spring 2008 for return bloom.

5. Bark grafting as a reliable method for changing apple varieties

Funding Source: NYSAES program start-up funds to SA Hoying, NY Apple Research and Development to Jentsch and Fargione

Objectives/accomplishments:
Changing varieties or strains is an important way for fruit growers to stay current with the market. However, planting a new orchard is an expensive and time consuming proposition often costing more than $10,000 per acre to remove, prepare, and replant an old orchard. The process from harvesting the last full crop in an existing orchard to harvesting the first crop in the new orchard can take more than 6-8 years. If the orchard planting system and spacing is appropriate, grafting-over can be done faster and more cheaply with no more risk involved than planting a new orchard. I established a demonstration block at the Hudson Valley lab where an older apple block was converted to several newer available strains of the popular Fuji variety. Grafting techniques and critical control points were videotaped during important stages of the process. These taped segments are being edited into a complete video for distribution to interested commercial fruit growers. We taught growers the technique at the Summer Hudson Valley Fruit Tour August 7, 2007 and visited interested growers to advise them.

6. Improving fruit color of Honeycrisp in the Hudson Valley

Funding Source: NYSAES program start-up funds to SA Hoying

Objectives/accomplishments:
The hot sunny summer climate in the Hudson Valley is not conducive to color development of apples, especially for marginally colored varieties such as Honeycrisp and Fuji. Schupp and Rosenberger established a strain planting at the HVL in 2001 to evaluate the possibility of color improvement through genetics. In an effort to find practical techniques for those growers with established orchards, we conducted trials comparing reflective fabric mulch, ground sprays of reflective paint, spray applications of kaolin clay, and summer pruning. Fruit from storage is currently being evaluated for color development. Work will continue in 2008.
7. Demonstration of fruit tree vigor management with renewal pruning

Funding Source: NYSAES program start-up funds to SA Hoying

Objectives/accomplishments:
The Hudson Valley lab’s IPM block was pruned using a Palmette Leader approach using limb renewal for demonstration of these techniques to area growers. This style of pruning and its benefit for vigor control and color development was featured on the HV Summer Fruit Growers tour. Photographs were taken and used in presentation at the Long Island Ag Forum in 2007 to further extend this information.

8. Establishing a research vineyard at the Hudson Valley Lab

Funding Source: NYS Dept of Ag & Mkts, Support for the Grape Research & Extension Program at the Hudson Valley Laboratory, 2007-08; Bill #S2105-D and A4305-D

Objectives/accomplishments:
We established a research vineyard with 27 different varieties of grapes, leveled and seeded rows, and established a basic trellis system in 2007. Varieties included 12 important vinifera, 15 hybrids, and 2 native varieties. We utilized the most up to date technology available including plant material, planting systems hardware and training systems. This vineyard was established to be able to conduct in-depth viticultural research on site. In 2007/8 we are conducting trials on the influence of nitrogen fertilization on vine growth and on winter protection of vines comparing different insulation materials for two of the more sensitive varieties in the vineyard using 4 different materials: straw, wood mulch, biodegradable celluloid material and soil. We also have purchased and set up equipment (Differential Thermal Analyzer, DTA) to monitor real-time cold hardiness of grape buds and wood. We will use this equipment to assess winter protection methods and provide information to growers about the hardiness of their plants and the advisability and level of pruning. Additionally in 2008, we expect to conduct canopy trials in the experimental vineyard and at local commercial vineyard to determine the optimal trellising system for Cornell’s new, vigorous releases, Noiret and Corot Noir. Eventually we will work on cultural practices that contribute to wine quality.

9. Site selection for sensitive grape varieties

Funding Source: NYS Dept of Ag & Mkts, Support for the Grape Research & Extension Program at the Hudson Valley Laboratory, 2007-08; Bill #S2105-D and A4305-D, NY Wine & Grape Foundation

Objectives/accomplishments:
We are into the second year of the Hudson Valley Mesoclimatic Study. Our objective is to identify prime sites for vineyard establishment in the Hudson Valley and to provide information to those wishing to evaluate a site for suitability. To do this, we placed data-logging temperature sensors throughout the Hudson Valley east and west of the Hudson River. Sensors range as far north as Albany county, west to Windham, NY, east to the eastern towns of Dutchess and Columbia counties, and south into Westchester county and almost to the New Jersey border. We have continuously collected hourly temperature data since November 2006 from more than 100 sensors that are distributed in the nine county, 6000 square mile area of the greater Hudson Valley. Using temperature data collected from the temperature sensor project we cooperated with Dr. Alan Lakso, IAGT, and others to help develop a grower friendly detailed map for identifying the best vineyard sites throughout NYS. We are contributing data for the Hudson Valley part of the project. Another prime objective is to teach and encourage individuals to use available technology to establish their own temperature monitoring schemes before establishing plantings and to be able to select the best reduced risk varieties based on the information they collect. We recently used summer data from 32 of our temperature logger locations to compare seasonal Growing Degree Days (GDD) and Season
Length (SL), another important factor in considering the best variety of grapes for any particular location. To date, the results have been somewhat surprising and indicate that the Hudson Valley can successfully grow and mature many important mid to late season vinifera with excellent wine-making attributes. We are working with Dr. L. Cheng and others to assess vineyard soil health status by developing a package of meaningful soil physical, biological, and chemical tests through a combination of field and laboratory methods. The data will be used to establish a database for the Hudson Valley vineyard soils.

10. Effects of Winter-Burying Canes and Vines on Bud and Cane Cold Tolerance, Tissue Composition, and Springtime Performance

Funding Source: Kaplan Fund, NY Wine & Grape Foundation – Viticulture, Federal Formula Funds all to M. Goffinet

Objectives/accomplishments:
Burying vines of sensitive varieties can be an effective method for protecting whole vines from catastrophic winter injury such as that which occurred in 2004 and 2005 in the Finger Lakes. The equipment is commercially available or can be easily fabricated. This method has been shown to be cost effective for certain sensitive varieties in the Finger Lakes yet is not widely used. Observations indicate that a number of potential problems using this technique are possible including infestation by crown gall to mechanically injured vines, accidental take out of vines by soil removal equipment and killing or delayed bud break on buried vines. We partnered with Martin Goffinet to look at vine burial in the Hudson Valley at Zitz Vineyard and found that burial was a very effective method for vine protection. We also saw that many sites in the Hudson Valley are less suitable for vine burial than Finger Lakes sites because of vineyard size, lack of available labor, variety composition, stony soil impeding equipment and potential for mechanical injury resulting in Crown Gall, and slope. Therefore, we are investigating other methods for winter protection that are more suitable for Hudson Valley vineyard.
Objective: To support the fruit extension programs the Hudson and Champlain Valleys and elsewhere in New York State.

NY has some of the finest Extension fruit programs in the nation if not the world. They are supported by a variety of departments and administered and run by dedicated professionals. My goal has been to provide the very best support I can to further improve the program. I have participated in advisory meetings and other planning sessions, spoken at fruit schools, tours, workshops, twilight meetings, provided technical demonstrations, written regular articles for Scaffolds and regional newsletters, and provided direct agent support through specific information, farm calls and telephone support. I plan to continue intensive program support when and where needed.

EXTENSION PRESENTATIONS
by Steve Hoying, 2006-07

Fruit grower meetings in New York, 2006-07:

Essential Components of New Orchards
January 9, 2007 Long Island Agricultural Forum, Riverhead, NY

Vertical Axe and other pruning methods
January 16, 2007 Hudson Valley Pruning Demonstrations and Workshop, Ulster and Columbia Co

Designing Effective Tree Support Systems
January 23, 2007 Lake Ontario Winter Fruit Schools, Newark, NY
January 24, 2007 Lake Ontario Winter Fruit Schools, Albion, NY

The Tall Spindle: The System for NY
February 14, 2007 Empire State Fruit and Vegetable Expo, Syracuse, NY.
February 27, 2007 Hudson Valley Fruit School, Kingston, NY

The ABC’s of Fruit Drop
February 26, 2007 Hudson Valley Fruit Schools, Kingston, NY

HV Grape Program Updates
February 28, 2007 Hudson Valley Grape School, Kingston, NY

Evaluating Existing Sites for Grapes
February 28, 2007 Hudson Valley Grape School, Kingston, NY

Looking Anew: Recalling and Reviewing the Many Factors of Pre-Harvest Drop
March 1, 2007 Upper Hudson/Champlain Commercial Fruit School, Lake George, NY

Crop Management Programs for Apples: 2007
May 17, 2007 Cooperative Extension Regional Thinning workshops, Ulster County, NY
May 17, 2007 Cooperative Extension Regional Thinning workshops, Columbia County, NY
May 23, 2007 Cooperative Extension Regional Thinning workshops, Saratoga County, NY
May 25, 2007 Cooperative Extension Regional Thinning workshops, Wayne County, NY
May 25, 2007 Cooperative Extension Regional Thinning workshops, Orléans County, NY
May 29, 2007 Cooperative Extension Regional Thinning workshops, Clinton County, NY

The Tall Spindle System and Tree Training Aides

Studies Encouraging Return Boom with Difficult Apple Varieties

Apple Planting Systems Research and Rootstocks for High Density Plantings
August 7, 2007 Hudson Valley Summer Fruit Tour, Dressel Farms, New Paltz, NY

Successful apple grafting techniques and demonstration
August 7, 2007  Hudson Valley Summer Fruit Tour, Cornell HVL, Highland, NY

Improving return bloom on difficult apple varieties
August 7, 2007  Hudson Valley Summer Fruit Tour, Cornell HVL, Highland, NY

Palmette apple pruning and limb management for improved fruit yield and quality.
August 7, 2007  Hudson Valley Summer Fruit Tour, Cornell HVL, Highland, NY

Training Apple Trees, Tricks and Tips
August 21, 2007  Long Island Summer Fruit Meeting, Wickham Orchards, Water Mill, NY

Cornell University and HVL Horticultural Program Activities
September 5, 2007  NYS Legislators Tour, Hudson Valley Lab, Dressel Farms, and Magnanini Vineyard and Winery.

Comparing Apples to Oranges (Grapes)
November 15, 2007  Recent Advances in Viticulture and Enology Conference (CRAVE), Ithaca, NY

Proper Pruning or Apples for Improving Yield and Fruit Quality
December 19, 2007  Winter Pruning Demo and Tour, Cutchogue, Riverhead, and Water Mill, NY

Which is the right apple orchard planting system?
January 18, 2006  Lake Ontario Winter Fruit Schools, Newark, NY
January 19, 2006  Lake Ontario Winter Fruit Schools, Albion, NY

Top-working with bark grafts.
January 18, 2006  Lake Ontario Winter Fruit Schools, Newark, NY
January 19, 2006  Lake Ontario Winter Fruit Schools, Albion, NY

China - Lessons learned on the new frontier.
March 7, 2006  Upper Hudson/Champlain Commercial Fruit School., Lake George, NY.

Study trip with IDFTA to China July 11-26, 2005
February 14, 2006  Empire State Fruit and Vegetable EXPO., Syracuse, NY.

2006 Thinning Conditions
May 30, 2006  Cooperative Extension Regional Thinning workshops, Wayne County, NY
May 31, 2006  Cooperative Extension Regional Thinning workshops, Orleans, County, NY

Planting System and Canopy Management - Sweet Cherries
July 13, 2006  Sweet Cherry Workshop, NYSAES, Geneva, NY

Cracking and Bird Control of Sweet Cherries
July 13, 2006  Sweet Cherry Workshop, NYSAES, Geneva, NY

Research with Sweet Cherries, Hard Cider Varieties
July 20, 2006  Inservice for Master Gardeners CCE Staff - Wayne County

Trellising Modern Orchards
August 2, 2006  Lake Ontario Fruit Program Summer Tour, Williamson, NY

Managing Tightly Spaced Orchards with Pruning and Apogee
August 2, 2006  Lake Ontario Fruit Program Summer Tour, Williamson, NY

Out of State Presentations, 2006-07:

Topics in Tree Fruit Nutrition
February 21, 2007  Ohio UAP Fruit Growers Meeting, Berlin Heights, Ohio

Peach management systems from a northern perspective.
March 1, 2006  IFTA Annual Meeting, Hershey, PA.

Managing Apple Tree Vigor
August 21, 2006  2nd International Symposium on Apple Production, Yantai, Shandong, China

Managing Apple Tree Vigor
August 24, 2006  Horticulture Class, Northwestern A&F University, Shaanxi, Xi’an, China
SUMMARY OF ENTOMOLOGY PROJECTS 2006-07

Peter J. Jentsch, Extension Associate
Henry Grimsland - Research Technician (Part time)

1. Can netted coverings and wood-chip mulch eliminate the need for pesticides in disease-resistant, columnar apples and dwarfing sweet cherries?

   Project title: Determining the Commercial Viability of an Insect Exclusionary Production System Using Disease Resistant Columnar Apple and Sweet Cherry Cultivars. (with Straub, Rosenberger, Schupp & Fargione)

   Funding source: NESARE funded research 2004-2008

   Objectives/accomplishments:
   An exclusionary pest management system for fruit production was developed and tested in a four-year pest management project. Four varieties of disease-resistant columnar apples and 4 dwarfing sweet cherry varieties were planted in a V-trellis high-density system. The system integrated wood chip mulches, micro-sprinkler irrigation, a fixed canopy spray system, and a tree trellis designed to support barrier netting that provided protection from hail, invertebrate and vertebrate pests, and immigrant arthropod pests. Plantings were established on three commercial fruit farms, one community-sponsored farm, and one university research orchard. The goal was evaluation of a viable production system that could yield high quality fruit without using synthetic pesticides. Disease and insect damage were significantly reduced using this exclusion system over four years. However, yields of the columnar varieties were dramatically lower than for conventional cultivars on dwarfing rootstocks. The fixed spray system provided significant reductions in spray drift in both open and netted canopy plots compared to conventional air-blast spraying. Single yearly applications of composted wood chip mulch reduced competition from weed species. However, these factors added significantly to the cost of production compared to conventional methods, requiring fruit pricing to exceed 3 to 4 times the present value of organic pricing to make this system sustainable.

2. Can internet and e-mail alerts that integrate weather forecasts, data from insect pheromone trapping, and insect developmental models reduce fruit damage in Hudson Valley orchards?

   Project title: Increasing Precision Application Of Newly Developed Insecticides And Minimizing Insecticide Resistance Through The Use Of Insecticide Class Rotation, Degree-Day Predictive Modeling And Digitally Communicated Recommendations For Managing The Apple Insect Complex (with Fargione)

   Funding source: NEFVI funded research 2007-2008

   Objectives/accomplishments:
   The purpose of this project is to provide regional fruit producers with timely information on pest populations, weather, insecticide efficacy, and insecticide mode of action so that producers can optimize the application of new reduced-risk insecticides. With access to temperature collection technology, degree-day predictive models, pest thresholds, and daily digital insect pest management information and recommendations, producers will have the information needed to optimize the use of reduced-risk insecticides in rotations and reduce the resistance potential in difficult-to-manage and damaging insect species. This information is communicated to growers through digital media formats (e-mail, regional fruit web sites) that allow faster delivery and more precise and informed insecticide selection and timing decisions. Farms that receive e-mails from the regional fruit extension program (Mike Fargione) will receive daily updates on insect presence, insect biofix and growing degree-days for each insect along with optimum timing for applications of registered insecticides with varying modes of action.
3. Can real-time video clips be an effective extension outreach tool for producers to use in pest management decision making?

Project title: Increasing Precision Application Of Newly Developed Insecticides And Minimizing Insecticide Resistance Through The Use Of Insecticide Class Rotation, Degree-Day Predictive Modeling And Digitally Communicated Recommendations For Managing The Apple Insect Complex (with Fargione)

Funding source: NYFVI funded research 2007-2008

Objectives/accomplishments:
The purpose of this project is to evaluate 3-minute video clips produced in orchards as a timely communication system for providing fruit growers with information on weather, insect development predictions, pest populations, insecticide efficacy, and insecticide mode of action so as to optimize pest management decision making.

4. Can pears be grown organically in the Hudson Valley using early season applications of kaolin clay and a bi-weekly summer oil program?

Project title: Investigating Kaolin Clay and Summer Oil for Commercial and Organic Pest Management in NY Pear production.

Funding source: Toward Sustainability Foundation, Cornell University

Objectives/accomplishments:
The purpose of this project was to determine if the insect complex (including the plum curculio, the lepidopteran and heteropteran complex, and pear psylla) could be managed organically. Results showed that pre-bloom and petal fall applications of kaolin controlled the insect complex on pears while the summer oil program managed the pear psylla populations as well as the commercial standard. The summer oil sprays also reduced Fabraea leaf spot.

5. Can the stink bug complex be managed in the Hudson Valley using reduced-risk insecticides?


Funding source: ARDP funded research

Objectives/accomplishments:
The purpose of this project was to study two management strategies that have a direct impact on stink bug damage on apple. These two strategies include the assessment of the efficacies of registered and experimental materials for reducing damage to apple and the incorporation of cultural methods using weed host reduction for use in managing the stink bug complex in Hudson Valley Orchards. Late season applications of numerous classes including a few of the reduced-risk neonicotinoid class have shown promise at reducing injury levels from the stink bug complex.

6. Can the grape berry moth be managed in Hudson Valley vineyards using mating disruption and a reduced risk insecticide program?

Project title: Evaluation of Commercial Mating Disruption in Hudson Valley Vineyards; Transitioning To Lower Risk In Hudson Valley Grape Berry Moth Management.

Funding source: NYS Ag. & Markets funded research
Objectives/accomplishments:

The grape berry moth (GBM) is the most destructive insect pest on grape in New York State. The purpose of this project was to study two management strategies to control the grape berry moth on vinifera grape. In 2007, a 1 acre mixed-variety vineyard was selected for pheromone mating disruption. Twist ties purchased from Pacific Biocontrol (Isomate-GBM) were placed at 400 ties per acre. The reduced-risk pyrethroid Danitol was applied over the entire vineyard leaving 4 untreated panels containing 3 vines per panel as pheromone-only controls. The single Danitol treatments at 16 oz./A applied at first hatch for each of three generations exhibited 100% clean clusters at harvest compared to the pheromone-only treatments that had damage exceeding 1%. However, 2007 was an easy year to control GBM since there were relatively few injured fruit even in untreated or poorly managed vineyards. Mating disruption for GBM in blocks less than 5-10 acres often allows unacceptable damage, so this approach may not work well in the relatively small vineyards commonly found in the Hudson Valley. More work is needed to better understand the biology and mate-finding mechanisms of GBM before reduced-risk strategies can be effectively deployed.

7. Can European red mite populations exceeding economic threshold at petal fall be managed using new reduced risk classes of miticides?

Project title: Using Alternative Management Strategies For Hudson Valley Mite Complex.

Funding source: Unfunded research. Grower support in use of commercial apple block and industry provided miticides.

Objectives/accomplishments:

The European red mite (ERM) can produce high over-wintering egg populations that can result in mite numbers exceeding economic threshold shortly after apple bloom in years with weather that favors mite development. A commercial block of Red Delicious with ERM populations exceeding 7 mites per leaf was used for a replicated trial of 11 miticides. Treatments were applied 10 days after petal fall. Plots left untreated eventually exceeded 40 ERM/lf. Single treatments of Carzol 92SP at 16 oz./A and 1% Damoil resulted in populations that exceeded the untreated controls with more than 45 ERM/lf. AgriMek at 20.0 oz./A + oil, Savey 50DF at 6.0 oz./A, Onager 1E at 16.0 oz./A, Zeal at 2.0 oz./A, and Envidor at 18.0 oz./A provided a range of control with populations ranging from 8 to 16 ERM/lf, respectively. Danitol at 16.0 oz./A, Nexter at 4.0 oz./A, Acramite 50WS at 16.0 oz/A provided unacceptable levels of control using a single application. Post application water samples revealed pH at 8.4. Hydrolysis of Nexter and Acramite may have reduced the efficacy of these materials.

8. Can reduced risk materials be rotated with older classes of insecticides to reduce the resistance potential for the oblique-banded leafroller?


Funding source: NYS Ag. & Markets funded research

Objectives/accomplishments:

The leafroller complex is comprised of numerous tortricid moth species known to feed on apple. The species of greatest concern in New York is the oblique banded leafroller, (OBLR) Choristoneura rosaceana (Harris). The purpose of this research was to study the efficacy of insecticides for use in a rotational management program to reduce the insecticide resistance potential of the OBLR. The study demonstrated the effectiveness of new chemistries for OBLR management for use in a rotational program in commercial orchards. The project also demonstrated the ability of reduced-risk
insecticides, such as the neonicotinoid class and insect growth regulators to conserve the mite predator *T. pyri* for biological mite control.

9. **Efficacy of experimental and newly registered reduced-risk insecticides compared to standard programs of older insecticides for managing the apple insect complex**


   Funding source: Agrichemical company funded research

   Objectives/accomplishments:
   The insect complex feeding on the fruit, foliage and wood of apple and pear in the northeast is very diverse in the number of insect families and in their population density. Left uncontrolled, insects can cause nearly 100% fruit damage in most years and reduce productivity and tree survival. These pests require season-long management each year. The yearly studies we conduct evaluate the efficacy of newly developed experimental and newly registered reduced-risk insecticides when compared to standard programs of older insecticide classes and untreated plots when timed to the seasonal insect complex. This data is then presented to the grower community through yearly publications of the Cornell Pest Management Guidelines, yearly fruit school presentations, in-depth workshops, newsletter articles in Cornell’s *Scaffolds Newsletter* and the NY State Horticulture Society publication *The Fruit Quarterly*. 
ENTOMOLOGY EXTENSION PROGRAMMING: 2006-07
Peter Jentsch

Extension education activity summary for January 2006 through March 2008:

• Made 25 oral presentations at 23 different meetings in 4 states with a cumulative audience of more than 1200 people.
• Wrote or contributed to 12 newsletter articles for Scaffolds and the Fruit Quarterly. These articles provided technical information to fruit growers.

EXTENSION PRESENTATIONS
made by Peter Jentsch, 2006-07

Educating Extension staff, field consultants, agrichemical reps, and other scientists, 2006-2007:

Using a novel chemistry Spinetoram, ‘Delegate’, by Dow Agrichemical, for Pear Psylla Management in the Hudson Valley of NY.

Transitioning to Organic Pear Psylla Management in the Hudson Valley of NY.
4-5 Nov. 2007, Great Lakes Fruit Workers Meeting, Niagara Falls, Canada

4-5 Nov. 2007, Great Lakes Fruit Workers Meeting, Niagara Falls, Canada


Results of insecticide field trials at the Hudson Valley Lab
6 Sep 2007 Annual Tour of Field Research Plots, Highland, NY

Results of Syngenta insecticide field trials at the Hudson Valley Lab
17 Aug. 2007 Tour of Field Research Plots to Syngenta Scientists, Highland, NY

Using a ‘Non-Chemical’ Approach for Pear Psylla Management in the Hudson Valley of NY.
16-17 Nov. 2006, 82nd Annual Cumberland-Shenandoah Fruit Workers Conference,

Results of insecticide field trials at the Hudson Valley Lab
8 Sep 2006 Annual Tour of Field Research Plots, Highland, NY

Progress on Grape Research at the Hudson Valley Lab:
13 Oct 2006 Field tour – Senator Larkin and colleagues, Highland, NY

Presentations at educational events within New York State, 2006-2007:

Grape Entomology in the Hudson Valley
29 Feb. 2008 Hudson Valley Fruit School, Kingston, NY

Web Links and Video Clips: New Tools for Teaching Fruit IPM
27 Feb. 2008 Hudson Valley Fruit School, Kingston, NY

Tree Fruit Insect Round-Up. Using Reduced Risk Insecticides in NY State
26 Feb. 2008 Hudson Valley Fruit School, Kingston, NY
Pest and Disease Management for Organic Apple
26 Jan. 2006-08 NOFA – 26th Annual Organic Farming & Gardening Conference, Saratoga, NY

Using Degree-Day Insect Developmental Models to Effectively Use Reduced Risk Insecticide Management Strategies
11 Jan. 2008 Long Island Agricultural Forum, Riverhead, NY

Seasonal Update on Insect Management for the Northern Hudson Valley
17 May 2007 Northern Hudson Valley Petal Fall Mtg., Hudson, NY.

Seasonal Update on Insect Management for the Southern Hudson Valley

Seasonal Update on Insect Management for the Upper Hudson Region
23 May 2007 Upper Hudson Region Petal Fall Mtg., Rexford, NY.

Grape Berry Moth Management in the Hudson Valley
2 March 2007 Hudson Valley Fruit School, Kingston, NY

Tree Fruit Insect Round-Up. Using Reduced Risk Insecticides in NY State
Feb. 2007 Hudson Valley Fruit School, Kingston, NY

Traditional and Novel Approaches to Insect and Mite Pest Management on Tree Fruit
19 Jan. 2007 Long Island Agricultural Forum, Riverhead, NY

Seasonal Update on Insect Management for the Northern Hudson Valley
10 May 2006 Northern Hudson Valley Petal Fall Mtg., Hudson, NY.

Seasonal Update on Insect Management for the Southern Hudson Valley

Seasonal Update on Insect Management for the Upper Hudson Region
24 May 2006 Upper Hudson Region Petal Fall Mtg., Rexford, NY.

Apple Pest Control In-Depth Workshop
15 March 2006 Cornell University’s Hudson Valley Laboratory, Highland, NY.

Presentations at out-of-state fruit grower meetings, 2006-2007:

Apple Pest Mgt, Using Precision Application Timings of Reduced Risk Insecticides.
12 Dec., 2008 New England Vegetable and Fruit Conf., NH

Pear Psylla Management Alternatives in Northeast Orchards.
12 Dec., 2008 New England Vegetable and Fruit Conf., NH
SUMMARY OF PLANT PATHOLOGY PROJECTS 2006-07
Dave Rosenberger, Fritz Meyer, and Anne Rugh

1. Will phosphite fungicides control apple scab, mildew, and rust diseases?

Project title: Feasibility of Managing Apple Scab, Rust Diseases, and Powdery Mildew with Trunk Applications of Phosphite Fungicides

Funding source: USDA Pesticide Management Alternatives Program, (2006-07, with Kerik Cox)

Objectives/accomplishments:
Phosphite fungicides (same class as Aliette) were used for many years to control Phytophthora diseases, but scientists in Ohio and North Carolina recently reported that one of these fungicides, when applied to apple tree trunks at green tip, controlled apple scab through petal fall. In 2007, trunk applications were tested at both Geneva and Highland. The trunk treatments were uniformly ineffective. However, in a different treatment, a surprising level of scab suppression was achieved by applying one of the phosphites to soil in the herbicide strips beneath trees. Work in 2008 will focus on this application strategy with the idea that phosphites mixed with herbicides in prebloom applications might control scab or at least enhance control when supplemented with contact fungicides such as mancozeb.


Funding source: Agrichemical companies, New York ARDP, USDA-PMAP, USDA-Smith-Lever funds, USDA-Hatch funds, New York State IPM

Accomplishments:
At the Hudson Valley Lab, we have optimized facilities, equipment and research orchards for efficient evaluation of pesticides. Over the past two seasons, we completed:
- 18 separate field trials aimed at understanding options for disease control that involved --
  - 34 different products,
  - 176 replicated treatments,
  - 582 separate spray applications, not counting maintenance sprays applied to these plots.
Trials included second generation SI fungicides (e.g., Indar, Inspire), fungicide package mixes (e.g., Flint+Scala, Inspire+Vangard), phosphite fungicides, summer disease fungicides, and fungicides to control black knot on plums. Fourteen reports covering 2006 and 2007 trials are being published in Plant Disease Management Reports. Results from these trials are used to compile disease control strategies presented at winter fruit schools and in extension articles.

4. New Approaches for Controlling Spread of Fire Blight During Summer

Funding source: USDA-Smith-Lever funds, USDA-Hatch funds, (NY ARDP ??: request pending)

Objectives/accomplishments:
The spread of fire blight during bloom is well known and can be forecast with several models. Very little is known about factors that enhance spread of fire blight during summer. A multidisciplinary group of scientists from Geneva, Highland, and University of Massachusetts failed to obtain funding for this work after applying to the NE IPM program for two successive years. The 380 custom-budded Lady Apple trees that we ordered for this trial in anticipation of funding are planted in a meadow orchard at the Hudson Valley Lab. These trees will be subjected to replicated fungicide and insecticide treatments during 2008 both before and after fire blight inoculum is misted over the actively growing shoots. We hope to determine what spray programs might be useful for limiting both populations of potato leafhopper and spread of fire blight to shoots.
5. Using Foliar Applications of Phosphite Fungicides to Control Summer Diseases on Apples

Funding source: NY Apple Research and Development Program (2007)

Accomplishments:

Previous work in North Carolina showed the combination of Captan plus ProPhyt (a phosphite fungicide) controlled sooty blotch and flyspeck as well as a mixture of Captan plus Topsin M. In two large field trials conducted during 2007, we showed that ProPhyt boosted activity of Captan but not of a Topsin-Captan combination, and that activity of ProPhyt involved more than simple acidification of the spray solution (as with LI-700) or spreader-sticker effects (as with Tactic). In the second trial, ProPhyt was applied to Honeycrisp, Royal Court and Cameo apple trees at two different rates either alone or in combinations with Captan, Topsin M, or Pristine. Analyses of flyspeck and sooty blotch control in 10 data sets from this trial showed that ProPhyt consistently boosted activity of Captan, but it only occasionally improved activity of Topsin M or Pristine. For seven of the nine comparisons where ProPhyt improved effectiveness of Captan, the low rate of ProPhyt (8 fl oz/100 gal, or 24 fl oz/A) was as effective as the higher rate (16 fl oz/100 gal or 48 fl oz/A). However, the residual activity of ProPhyt was more limited than that of Topsin M or Pristine, and adding ProPhyt did not improve control of summer fruit rots provided by Captan, Topsin M, or Pristine used alone. We conclude that the ProPhyt-Captan combination is a cost-effective alternative to Topsin M-Captan combinations for controlling sooty blotch and flyspeck in summer sprays, but Pristine or the Topsin M-Captan combination are more effective options in blocks where black rot or white rot are perennial problems.

6. Effectiveness of Lime-Sulfur for Controlling Summer Diseases on Apples

Funding source: New York State IPM Program (2006, with Peter Jentsch)

Accomplishments:

Liquid lime sulfur (LLS) was applied to apples during summer at various rates and timings to determine its effectiveness for controlling sooty blotch, flyspeck, and summer fruit rots. Four applications of LLS at either 2 qt or 4 qt controlled flyspeck just as well as four sprays of Topsin M plus Captan (the commercial standard). Four applications of LLS at 1 qt/100 gal were less effective, but applying the low rate six times improved performance to equal that of the standard treatment. Based on this trial, organic farmers could adopt LLS sprays during summer to control sooty blotch and flyspeck, but additional work is needed to determine if summer sprays of LLS sprays adversely affect fruit size or productivity of the sprayed trees.

7. Evaluation of Organic Pest Controls and Fruit Thinning on Multiple Apple Cultivars

Funding source: New York State IPM Program (2006, with Peter Jentsch)

Accomplishments:

Disease and insect control strategies suitable for organic farmers were evaluated in an apple variety block that contained 15 different cultivars. The organic treatments were compared to similar sets of trees that received either standard pest management treatments or were left unsprayed. Thirty-three different parameters were evaluated on each of the 15 cultivars to assess effectiveness of pest control programs and their impacts on productivity. Due to the high insect and disease pressure in this orchard, neither the standard nor the organic treatments provided commercially acceptable levels of pest control. Insect damage was found on 41 to 53% of fruit at harvest, but the organic and standard programs were comparable for most of the insect pests evaluated. However, the standard program was more effective than the sulfur in the organic program for controlling black rot, bitter rot, and lenticel spotting caused by Botryosphaeria species. Pesticides plus application costs totaled $650/A for the standard program as compared to $1,173/A for the organic program. Total yield per acre (including fruit damaged by pests) was 209, 409, and 861 bushels per acre for the unsprayed, organic, and standard treatments, respectively. Pest control costs per bushel were $2.98 for fruit...
from the organic block compared to $0.76 for the standard. This trial convinced us that pest-free apples can be produced organically in New York, but organic producers will need a sales premium compared to standard growers due to the high costs and reduced yield associated with organic pest control. Two applications of liquid lime-sulfur provided effective thinning but was especially damaging to fruit size and total yield.

8. Evaluating Honeycrisp Strains for Improved Color and Quality

Funding source: NY Apple Research and Development Program (with Jim Schupp)

Accomplishments:
A block of Honeycrisp apple trees located at the Hudson Valley Laboratory was established by Dr. Jim Schupp in 2001 using trees provided by Dr. David Bedford from the University of Minnesota. These trees represented 55 potentially different strains of Honeycrisp that were selected for differences in degree of red color development and for variations in stripe versus blush patterns of coloration. Fruit were evaluated for color development in 2004, 2005, and 2006, and several strains were selected for their excellent color development and fruit quality. In March of 2006, Schupp collected grafting wood from those selections (with permission from the fruit breeders in Minnesota) and top-worked trees in Pennsylvania to determine if grafted trees will remain true to type. Decisions on if/when to release the best strain or strains will be made by Schupp after evaluation of the top-worked trees.

9. Evaluation of European apple cultivars useful for producing hard ciders

Funding source: USDA-Smith-Lever funds, USDA-Hatch funds

Objectives and accomplishments:
Eleven European cider apple cultivars were planted in spring of 2003, with all trees propagated on M.9 rootstock (Nic.29 strain). Trees were evaluated for susceptibility to diseases in 2006 and 2007. All of the apple cultivars were relatively resistant to apple scab infections on both leaves and fruit. Most cultivars were also relatively resistant to cedar apple rust infections on leaves, although all of the cultivars except Binet Rouge had leaf spots on more than 14 percent of leaves, and some of the leaf spotting was caused by rust infections that failed to develop because of host incompatibility reactions. All of the cultivars were very susceptible to summer fruit decays caused by Botryosphaeria species (B. obtusa and B. dothidea). The cultivar Major was so susceptible to Botryosphaeria fruit decays that most fruit decayed and dropped to the ground before the fruit matured. Although 10 fungicide sprays were applied to this block in 2007, we still failed to control Botryosphaeria fruit decays on the cultivar Major. Five other cultivars also had more than 15% of fruit with decay at harvest in 2007. The high susceptibility to Botryosphaeria shown by some of these apple cultivars could limit their usefulness in regions where hot humid summers favor development of black rot and white rot fruit decays.

10. Biological investigations on apple postharvest decays caused by Penicillium species

Project title: Multiple Strategies for Control of Patulin in Apples and Apple Products

Funding source: USDA Food Safety Grant, via sub-contract with Penn State (2003-2007)

Objectives and accomplishments:
Our objective in New York was to determine how to reduce inoculum recycling that contributes to postharvest decays of apples while the lead investigators at Penn State focused on how to avoid patulin, a toxin from Penicillium spp. that contaminates apple juice if juice apples have decays. During three years of investigation under this project, we showed that Penicillium spores that recycle on field bins are the primary source of inoculum for postharvest decays and that Penicillium spores from orchard soils and from fruit surfaces at harvest are relatively unimportant. Methods for reducing spore numbers on bins and in packinghouse air were investigated. Spraying packinghouse floors with a disinfectant at night after spores settled to the floor did not have much impact on inoculum levels the following day, presumably because not enough of the total surface area inside
packinghouses could be treated. In one large trial, empty bins treated with quaternary ammonia sanitizer had more than 99.9% reduction in spore numbers, but in a second trial involving colder water the sanitizer reduced spore populations by only about 75%. Additional work is required to find a cost-effective way of sanitizing field bins.

11. Feasibility of using preharvest sprays to control postharvest diseases

Funding source: BASF Chemical company; USDA-CREEES Multi-State (NE-1018)

Accomplishments:
For the past 40 years, apple storage decays caused by Botrytis cinerea and Penicillium species have been controlled by drenching fruit with fungicides immediately after harvest. The postharvest drench usually contains both a fungicide and diphenylamine (DPA), an antioxidant that is used to control the physiological disorder known as superficial scald. However, the recycling drenches accumulate and recycle inoculum for apple decay pathogens and raise concerns about cross-contaminating huge quantities of fruit with human pathogens. Impending registrations for foggable formulations of DPA may eventually negate the need for postharvest drenching. Field trials were conducted both at the Hudson Valley Lab and in several commercial orchards to determine if fungicides (especially Pristine) applied within several weeks of harvest could be used to control postharvest apple decays. Although Pristine suppressed postharvest decays caused by Penicillium and Botrytis, it generally failed to provide control equivalent to that obtained with postharvest drenching. However, the research trials involved wounded fruit and high inoculum levels, so the control achieved with Pristine might be adequate under most commercial conditions. An interesting observation from one trial was that a combination of Tospin M plus Captan applied 10 days prior to harvest suppressed external carbon dioxide injury during long-term CA storage whereas Pristine applied at the same time did not. This observation is being tested in another trial currently under way.

12. Postharvest fungicide evaluations, 2006-07

Funding source: Agrichemical companies, USDA-CREEES Multi-State (NE-1018)

Accomplishments:
The 16 postharvest fungicide trials completed in the past two years included 243 separate treatments. Trials were designed to help us understand the activity of and best uses for Mertect, Captan, Scholar, and Penbotec. We also investigated interactions to be expected when these fungicides are combined with 1-MCP treatment or with DPA in postharvest drench tanks, effects of various holding times on fungicide activity, post-infection activity of the fungicides, and potential benefits of combining Captan with either Scholar or Penbotec as a resistance management strategy. Scholar and Penbotec are both extremely effective new fungicides for controlling apple decays during storage, but their high cost may limit commercial adoption.

13. Controlling Fabraea Leaf Spot on Pears: (See summary in the Entomology section)

14. Controlling black knot on plums

Funding source: USDA-Smith-Lever funds, USDA-Hatch funds

Objectives/accomplishments:
Bravo is very effective for controlling black knot on plums, but it cannot be applied after petal fall. Another fungicide is needed for post-petal fall sprays when black knot inoculum may still be available to cause new infections. In an experiment initiated in 2005, several new fungicides were evaluated for their effectiveness in controlling black knot on plums. Results collected in 2006 suggested that Indar and Elite were nearly as effective as Bravo for controlling black knot. However, due to high variability among trees and low disease pressure, normal statistical analysis (95% confidence interval) showed that even though these treatments had only 3.2 to 3.5 knots per limb,
they were not statistically different from the unsprayed control that had 8.1 knots per limb. (Differences were significant at the 90% confidence interval.) Treatments were reapplied to trees in 2007 and results should be available in 2008.

15. Controlling Bacterial Canker on Apricots

Funding source: USDA-Smith-Lever funds, USDA-Hatch funds

Objectives/accomplishments:
In the Hudson Valley, young apricot trees often collapse and die within several years of planting. Pseudomonas syringae, the bacterial canker pathogen, is suspected as the cause of this tree collapse problem because P. syringae can move systemically within apricot trees whereas it rarely does so in cherry trees. South African fruit growers visiting the Hudson Valley Lab once suggested that they could minimize losses of apricot trees to P. syringae by incorporating a copper-based fungicide into a latex paint that was applied to trunks and lower scaffolds in late fall each year. A trial was established at the Hudson Valley Lab in 2003 when three apricot cultivars (Harogem, Hargrande, Harlayne) were planted in randomized-block design and then received annual treatments involving either no fall trunk paint, white trunk paint alone to suppress southwest injury, or white trunk paint plus copper fungicides. The paint treatments were applied yearly from 2003 through 2006. The planting is still under observation, but initial results suggest the cultivar susceptibility differences were more important than effects of paint or copper treatment. However, even though this planting was established next to a hedgerow of wild cherries that were loaded with canker, relatively few trees died from canker in our planting. We suspect that the key to keeping apricots alive in the Hudson Valley is to avoid dormant pruning and to prune only on hot dry days after fruit set (as part of thinning) and after harvest. Using that approach, we have lost only two of the 36 trees in this block despite the fact that we located the planting in a high-inoculum location.

16. How Stone Fruit Viruses May Affect New Cultivars and Rootstocks

Project title: Determining Susceptibilities of New Cherry, Plum and Apricot Cultivars and Rootstocks to X-Disease Phytoplasma and Tomato Ringspot Virus

Funding source: Competitive Federal Formula Funds via NYSAES-Geneva (3 yr, with Steve Hoying and Mark Fuchs)

Objectives:
More than 800 cherry, peach, and plum trees have been ordered for planting in 2009. Trees represent a broad range of cultivars propagated on various rootstocks. At planting, trees will be divided into three groups. After trees have become established, one group will be inoculated with the X-disease pathogen, one group will be inoculated with tomato ringspot virus, and one group will be grown as non-inoculated controls. Trees will be monitored for visual symptoms and will also be tested using serological or molecular-biological techniques to determine susceptibility of new stone fruit cultivars and rootstocks to X-disease and tomato ringspot virus. These diseases are especially troublesome in stone fruit plantings in the Hudson Valley, and understanding more about cultivar susceptibility and symptoms is essential for managing these diseases in our region.
PLANT PATHOLOGY EXTENSION ACTIVITIES, 2006-07
Dave Rosenberger

In-State presentations at fruit grower meetings in 2006-07:

**Apple Disease Management Strategies for 2007**
12 Jan 07  Lake Ontario Winter Fruit Schools, Newark, NY.

**Disease Control for Stone Fruits, Apples, and Pears**
19 Jan 07  Long Island Ag forum, Riverhead, LI.

**Managing Apple Diseases Organically**
14 Feb 07  Empire State Fruit and Vegetable Expo, Syracuse, NY.

**What Growers Can Do in the Orchard to Control Rots in Storage**
14 Feb 07  Empire State Fruit and Vegetable Expo, Syracuse, NY.

**Changes in New York Agriculture**
5 Apr 07  Paltz Club, Modena, NY

**Seasonal Update on Fruit Disease Control for the Northern Hudson Valley**
17 May 07  Northern Hudson Valley Petal Fall Mtg., Hudson, NY.

**Seasonal Update on Fruit Disease Control for the Southern Hudson Valley**
17 May 07  Southern Hudson Valley Petal Fall Mtg., Milton, NY.

**Seasonal Update on Fruit Disease Control for the Upper Hudson Region**
23 May 07  Upper Hudson Region Petal Fall Mtg., Rexford, NY.

**Seasonal Update on Fruit Disease Control for the Champlain Valley**
29 May 07  Champlain Valley Petal fall Mtg., Peru, NY.

**Seasonal Update on Fruit Disease Control for Long Island**
20 Aug 07  Suffolk County Grower Twilight Mtg, Cutshogue, NY.

**Behind Closed Doors: Understanding Decay Problems in CA Storages**
28 Aug 07  Storage Workshop, Ithaca, NY.

**Combining Old and New Fungicides to Maximize Control of Postharvest Decays**
28 Aug 07  Storage Workshop, Ithaca, NY.

**Managing Diseases of Tree Fruits in Nurseries and Landscape Plantings.**
19 Jan 2006  Long Island Ag Forum, Riverhead, LI.

**Controlling Common and Unusual Diseases of Apples and Stone Fruit**
20 Jan 2006  Long Island Ag Forum, Riverhead, LI.

**Impressions of Apple Pest Management in China**
14 Feb 2006  Empire St. Fruit & Vegetable Expo, Syracuse, NY.

**Fruit Disease Roundup**
21 Feb 2006  Hudson Valley Fruit Grower School, Kingston, NY.

**Impressions of China from the IDFTA Tour**
22 Feb 2006  Hudson Valley Fruit Grower School, Kingston, NY.

**New Positions at the Hudson Valley Lab and Senator Larkin’s Task Force Efforts**
23 Feb 2006  Hudson Valley Fruit Grower School, Kingston, NY.
Using Cougarblyte to Maximize Effectiveness of Streptomycin Sprays during Bloom
7 Mar 2006 Upper Hudson/Champlain Fruit School, Lake George, NY

Fungicides and How They Work to Control Apple Diseases
15 Mar 2006 In-Depth Apple IPM School, Highland, NY

Strategies for Controlling Apple Diseases from Green Tip to Pink Bud
15 Mar 2006 In-Depth Apple IPM School, Highland, NY

Strategies for Controlling Apple Diseases During Bloom and Petal Fall
15 Mar 2006 In-Depth Apple IPM School, Highland, NY

Strategies for Controlling Apple Diseases During Summer
15 Mar 2006 In-Depth Apple IPM School, Highland, NY

Apple Disease Update
10 May 2006 Tree Fruit Petal Fall Meeting, Hudson, NY
10 May 2006 Tree Fruit Petal Fall Meeting, Milton, NY
17 May 2006 Tree Fruit Petal Fall Meeting, Rexford, NY
24 May 2006 Tree Fruit Petal Fall Meeting, Milton, NY

Late-Season Disease Control; Postharvest Chemicals and Uses for Storage Problems
10 Aug 2006 Apple Harvest & Storage Meeting, Highland, NY

Results from fungicide field trials at the Hudson Valley Lab
8 Sep 2006 Annual Tour of Field Research Plots, Highland, NY

Overview of Research at the Hudson Valley Lab
11 Sep 2006 Field tour for Japanese visitors, Chemtura Chemical Co.

Progress on Grape Research at the Hudson Valley Lab: Introductions
13 Oct 2006 Field tour — Senator Larkin and colleagues, Highland, NY

Presentations for consultants, agribusiness, or tree fruit research/extension professionals in 2006-07:

Phosphite Fungicides: Do They Fit in Apple Spray Programs?
23 Oct 07 New England, Canadian, NY Fruit Workers Conf., Burlington, VT.

Organic Apple Fungicides Limit Yield: What are the Options
23 Oct 07 New England, Canadian, NY Fruit Workers Conf., Burlington, VT.

Phosphite Fungicides: Do They Fit in Apple Spray Programs?
5 Nov 07 Great Lakes Fruit Workers Meetings, Niagara Falls, Ontario, Canada.

Organic Apple Fungicides Limit Yield: What are the Options
5 Nov 07 Great Lakes Fruit Workers Meetings, Niagara Falls, Ontario, Canada.

Can Preharvest Fungicide Sprays Substitute for Apple Postharvest Treatments
6 Nov 07 Great Lakes Fruit Workers Meetings, Niagara Falls, Ontario, Canada.

Impact of Organic Pest Control on Productivity of 15 Apple Cultivars
15 Nov 07 Cumberland-Shenandoah Fruit Workers Meeting, Winchester, VA.

Phosphite Fungicides: A New Tool for Apple Disease Control
15 Nov 07 Cumberland-Shenandoah Fruit Workers Meeting, Winchester, VA.

Can Preharvest Fungicide Sprays Substitute for Apple Postharvest Treatments
15 Nov 07 Cumberland-Shenandoah Fruit Workers Meeting, Winchester, VA.

Unusual Diseases and Disorders in the Hudson Valley in 2006
Control Strategies for Orchards with SI-resistant Apple Scab
16 Nov 2006  82nd Cumberland-Shenandoah Fruit Workers Conf., Winchester, VA

Postharvest Disease Control on Apples: Past, Present, & Future
16 Nov 2006  82nd Cumberland-Shenandoah Fruit Workers Conf., Winchester, VA.

Effectiveness of Vangard and Scala for prebloom scab control.
17 Nov 2006  82nd Cumberland-Shenandoah Fruit Workers Conf., Winchester, VA.

Postharvest Disease Control on Apples: Resistance Management via Sanitation and Captan?
2 Nov 2006  Syngenta Pome Fruit Postharvest Meeting, Phoenix, AZ

Invited presentations at out-of-state fruit grower or university meetings, 2006-07

Rethinking Scab Control When Apple Fungicides Stop Working
12 Jan 07  Illinois Specialty Crop and Agritourism Conference, Springfield, IL.

Controlling Brown Rot and Bacterial Spot in Peaches
12 Jan 07  Illinois Specialty Crop and Agritourism Conference, Springfield, IL.

Fire Blight Management and a Disease Management Program for Apples
12 Jan 07  Illinois Specialty Crop and Agritourism Conference, Springfield, IL.

"One Bad Apple…": Epidemiology of Pathogens in Apple Storages
29 Jan 07  Dept Seminar, Dept. Plant Pathology, Michigan State University, MI.

Fungicide Resistance Management in Apple
30 Jan 07  Michigan State University IPM Fruit School, Kalamazoo, MI.

Postharvest Disease Control for Apples
30 Jan 07  Michigan State University IPM Fruit School, Kalamazoo, MI.

Relearning What Your Father Knew about Apple Scab
17 Jan 2006  Ohio Fruit & Veg. Growers Congress, Columbus, OH.

Controlling Honeycrisp Fruit Rots and Maintaining Honeycrisp Quality
17 Jan 2006  Ohio Fruit & Veg. Growers Congress, Columbus, OH.

Discussion of Apple Disease Control
17 Jan 2006  UAP/BASF Fruit Grower Dinner, Columbus, OH.

Prevention and Control of Apple Tree Bark Diseases

Sooty Blotch, Flyspeck, and Black Rot on Apples

Stone Fruit Disease Management

What's Happening in Orchards in the Northeast?  A Panel Discussion

Controlling Summer Diseases and Postharvest Decays on Apples
17 Aug 2006  New England Fruit Consultants Field Day, Greenville, MA.
PUBLICATIONS
Authored or Co-Authored by Scientists at the Hudson Valley Lab
2006-2008

Refereed Journal Articles


Abstracts of Papers Presented at Scientific Meetings
http://www.apsnet.org/meetings/2006/abstracts/a06ma639.htm

http://www.apsnet.org/meetings/2006/abstracts/a06ma638.htm

http://www.apsnet.org/meetings/div/ne05abs.asp

http://www.apsnet.org/meetings/div/ne05abs.asp

University Publications


**Articles in New York Fruit Quarterly:**

Note: Accessible on-line at http://www.nyshs.org/fq/.


**Extension Newsletter Articles:**

Note: Many of the following articles can be accessed on-line as follows:

*Scaffolds Fruit Journal:* http://www.nysaes.cornell.edu/ent/scaffolds/

*Cornell Fruit Handling and Storage Newsletter:* http://www.fruit.cornell.edu/cfhsnews.html


Hoying, S. 2007. Spring Fertilizers Ag Focus 8(4): 1, 5. Orange and Ulster County CCE
Hoying, S. 2006. Cultural practices for apples. WNY Fruit Notes 06(13): 1
Jentsch P. J. 2007 Hudson Valley Psylla Management Options From Pre-Bloom To Petal Fall Scaffolds Fruit Journal 16 (3); 3-5.
Jentsch P. J. 2007 It Was the Best of Years in Regards to Grape Insect Pest Management in the Hudson Valley of NY. Hudson Valley Grape Newsletter 1 (3). October 1.
Jentsch P. J. 2007 Living With The OP Transition Or Transforming To A Non-OP Insect Pest Management Program From Petal Fall To First Cover. Scaffolds Fruit Journal 16 (8); 10-11.

Extension publications other than newsletters:


Reports of field trials published in Plant Disease Management Reports (PDMR)
Prior to 2007, PDMR was known as Fungicide and Nematicide Tests.


Changes in Facilities and Equipment, 1997-2007

Maintenance, upgrades, and changes funded by the Hudson Valley Research Laboratory, Inc.

- Driveway, parking areas, and orchard roadway were completely repaved, 1997.
- Renovated restrooms for handicapped access as required by the mortgage holder, 1998.
- Drywall ceiling installed in the head house leading to the greenhouses, 2000.
- Replaced all lab entrance doors with double-paned glass doors for energy savings, 2001.
- Replaced shop doors and installed automatic door openers to extend life expectancy for the four double overhead doors on the garage, 2002.
- Installed new drainage lines on both sides of the front drive to remediate flooding problems, 2004.
- All exterior walls of the building were insulated by adding studs and fiberglass insulation to insides of the walls, 1999-2007.
- Insect rearing room was converted to an office, 2006.
- Boiler room entrance changed to accommodate a recessed door that opens outward as required by N.Y. State boiler inspector, 2006.
- AC unit for old section of the building was replaced, 2006.
- Conference room completely renovated, 2008.

Changes funded by Cornell University and HVL scientist research programs:

- Two greenhouse furnaces replaced, 1998.
- Replanting of entomology orchards completed in 1998, replacing original 1964 test orchards.
- Fume hood in the horticulture lab was renovated to meet current safety standards, 2000.
- Chevy 3500 stake-body truck purchased to pull equipment trailers and handle larger loads, 2000.
- New lab benches installed in the entomology vegetable lab, 2001.
- Flail mower purchased for chopping brush after pruning, 2002.
- Fruit entomology lab renovated, including installation of windows opening to the hallways, 2003.
- Two John Deere Gators purchased for moving people, equipment, and harvested fruit to and from research orchards, 2005, 2007.
- Replaced leaking main water line that in had been installed in the 1960’s to supply spray water from the pond to the spray tower on top of the hill, 2006.
- Purchased John Deere 5525N four-wheel-drive tractor with spray cab, 2007.
- Purchased New Holland TZ22 lawn tractor with 60-inch mower deck for working vineyard and narrow orchard plantings, 2007.
- One-acre vineyard established for horticultural research (2007), thanks to funding secured by the efforts of Senator Larkin and his Senate colleagues.
- Installed 2,500 ft of woven wire deer fencing, thereby completing the transition from electrical 7-wire slanted deer fencing to woven wire for the entire research orchard, 2007.
- Installation of teleconferencing facilities in the laboratory conference room, 2008.