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ENYCHP Educators:

Fruit

Laura McDermott
Phone: 518-791-5038
Email: lgm4@cornell.edu
Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu
Berries & Grapes

Michael Fargione
Phone: 845-691-7117
Email: mjf22@cornell.edu
Tree Fruit

Kevin Iungerman
Phone: 518-885-8995
Email: kai3@cornell.edu
Tree Fruit & Grapes

Vegetables

Chuck Bornt
Phone: 518-859-6213
Email: cdb13@cornell.edu

Amy Ivy
Phone: 518-561-7450
Email: adi2@cornell.edu

Teresa Rusinek
Phone: 845-340-3990 x315
Email: tr28@cornell.edu

Crystal Stewart
Phone: 518-775-0018
Email: cls263@cornell.edu

Maire Ullrich
Phone: 845-344-1234
Email: mru2@cornell.edu

Layout:
Carrie Anne Doyle

Content Editor:
Maire Ullrich

The Produce Pages

**A Newsletter for Vegetable, Small Fruit, Tree Fruit
and Grape Growers in Eastern New York**

The ENYCHP Welcomes Our New Farm Business Management Educator: Robert Weybright

The ENYCHP is happy to announce that Bob Weybright has joined the team as its newest member, providing programming and information on farm business management/ag economic development topics. Bob lives in Dutchess County and is returning to Extension work with Cornell University. His past work includes work with the Geneva Experiment Station on a USDA Grant providing business development assistance to agriculture specialty food producers, and most recently as the Agriculture Issue Leader in Dutchess County.



Bob has a number of years' experience working with the Agriculture industry in New York and across the country. He has worked extensively with growers and producers working with a focus on strategic business development and growth, through incorporating current and innovative marketing and industry insights. His work growers, entrepreneurs and companies cover a variety of industries including specialty food manufacturers, farmers, facility maintenance, commercial bakery, as well as individuals exploring new business activities.

Through his work with the NECFE (Northeast Center for Food Entrepreneurship) center of Cornell's Geneva Experiment Station he provided individual business consultations with more than 350 small and rural based businesses across the United States, with a focus on the Northeast and New England regions. In addition to providing individual consulting he has made a number of presentations that include: The Hawaiian International Conference on Business, Farmers Direct Marketing Association annual meeting, as well as numerous seminar presentations throughout the Northeast, New York, New Jersey, Canada and Australia. Presentation audiences include rural economic development agencies such as Appalachian Regional Commission, New York State Planning Society, and University based education seminars.

Bob brings with him a broad base of experience. His consulting work has involved both domestic and international projects, while holding a variety of management, marketing, sales, manufacturing positions. His sales experiences include specialty, fresh and fresh-cut produce; produce processing aids; marine supplies; consumer goods; and wholesale foods. His management experiences include produce processing, institutional food service, and repair centers for marine electronics, inflatable boats, and outboard motors. Looking to the future Bob sees a challenging but encouraging future for agriculture in New York State and the region. Consumer tastes and desires in food have matured and are now looking for quality, freshness, good taste, and value. This is a shift from past times where low price were the primary driver for most all consumers. The idea of value is not totally unique, but has reached a point to where it can be leveraged to support future growth in the region.

Although Bob will not be starting until mid-January, he will be attending many of the winter workshops in the coming weeks so please be sure to introduce yourself! -Chuck Bornt, ENYCHP

Electronic versions of *The Produce Pages* are available at
http://cdvsfp.cce.cornell.edu/submission.php?id=166&crumb=crops|crops|asparagus|crop*1.

Serving the educational and research needs of the commercial small fruit, vegetable and tree fruit industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties

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'New' Vegetable Pests on Long Island

By Dan Gilrein, Extension Entomologist, Cornell Cooperative Extension of Suffolk County, LI Fruit & Vegetable Update

This past summer several unusual insect pest problems were seen on Suffolk County farms. In some cases damage was significant resulting in losses. Although each year insects or mites new to Long Island are found in ornamental plants, new pests in food crops are relatively uncommon. Growers are aware of spotted wing drosophila, which appears so far to be mainly a problem in caneberries and blueberries and is apparently going to be an annual pest in late-season crops, and brown marmorated stink bug, which appears to now be established in Suffolk County with the discovery of immature stages in several locations. Some of the other unusual and new pests seen this year in vegetables are probably not going to be annual problems, though growers should be aware in case they start appearing more regularly.

Hawaiian beet webworm

Though this pest appears here periodically 2013 was notable for the very unusual large, early (August) and widespread population on farms and the amount of damage it caused. Infestations were also reported in NJ. This insect overwinters in subtropical areas including Florida, annually invading areas to the north though we don't see it on Long Island in most years. The small, greenish caterpillars make holes and webbing in leaves of spinach, vegetable amaranth, beets, swiss chard and related crops as well as some weeds. Lambsquarters and



Hawaiian beet webworm moth

especially pigweed seem to be favored. A few ornamentals are also hosts, notably amaranth relatives like Love-lies-bleeding. The caterpillars will move onto some other plants once preferred hosts no longer available, though we have yet to see real problems with this. The adult stage is a small moth; the upper side is chocolate-brown with distinctive white bands. The underside is white, making them appear almost white when flying. Only a few insecticides are specifically labeled, including some Bt products. Most other insecticides used for other caterpillars will provide incidental control.

Tomato pinworm and russet mite

Tomato pinworm is the small caterpillar of a moth. It typically creates small mines in leaves of tomato but will also feed on eggplant, potato and some related weed hosts. Leaves may be folded and larvae sometimes move into fruit, usually at the stem end. Damage levels can reach 70% or more. Another pest that only overwinters outdoors in the far southern US, it can be transported on southern-grown transplants brought in by commercial farms or retail stores.



Hawaiian beet webworm damage to beet

However, at least three cases in home gardens were seen on Long Island that had no obvious connection to southern sources – infestations nearby may have been the source. Fortunately no problems were found in commercial fields. It is sometimes a pest in greenhouse tomatoes. We are watching for the similar and related tomato leafminer (*Tuta absoluta*), which has become a serious tomato pest in much of

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'New' Vegetable Pests on Long Island, continued from page 2

Latin America and Europe. It also mines leaves but will feed in stems and green fruit and will also damage peppers, eggplant, potatoes, and related hosts. So far it has not been found in the US. Tomato russet mite was found causing heavy damage to one tomato field; plants originated with a southern grower which may explain how it arrived here. It is also not known to overwinter outdoors in our area. Although easily controlled, by the time damage is noticed mite numbers are extremely high. Infestations cause severe bronzing of stems and foliage; leaves may be distorted and drop. Hosts include tomato and most related plants, as well as bindweed and morning glory species.

Pepper maggot

Unlike the others this is a native insect that can overwinter in our area. It prefers peppers and eggplant over other hosts, though tomato and some related weeds can also be attacked. Among peppers there appears to be a decided preference for some cultivars over others. The adults are a type of fruit fly, but in a group unrelated to the fruit flies like SWD or familiar ones that hover around decaying fruit in late summer. The pest has been reported from home gardens here and from farms elsewhere including NJ and CT, but was found on one Suffolk farm for the first time in recent memory. One hot pepper variety was heavily



Tomato pinworm damage to fruit

attacked, leaving bells nearby almost untouched. Larvae tunnel in fruit walls and centers. Damage may not be apparent until fruit are cut open or fruit may deteriorate in shipment. The pest poses special risks for organic growers where control options are more limited. Control strategies include sticky yellow traps to detect fly activity, a commercial bait for adults after emergence in late spring and summer, and using favored varieties as a 'trap crop' and destroying fruit before larvae emerge to pupate. Rotation to new ground away from infested areas, if possible, can also help.

Pickleworm

Another tropical species, the caterpillar stage of this moth feeds inside fruits of various cucurbits especially summer squashes and to some extent winter squashes as well. *Cucumis* species, such as cucumber and cantaloupe, are less preferred and watermelon is usually not attacked. Often it is almost impossible to identify infested fruit from external symptoms – it is only apparent when cut open. Predicting when control might be needed is difficult, as monitoring methods are not yet reliable. Fortunately infestations were very uncommon this year and appeared in late summer and early fall, most likely from moths migrating in. The closely related melonworm has not been reported to us yet on Long Island.

Reference: Capinera, J. L. 2001. Handbook of Vegetable Pests. Academic Press, NY

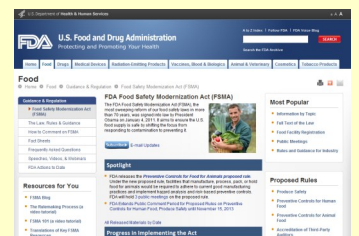


Lower foliage on tomato shows bronzing from tomato russet mite. Photo by M. Daughtrey

**Stay Up-to-Date with FSMA
(Food Safety Modernization Act)**

Aside from a voluminous website on the new rules and regulations, the FDA has an e-mail sign-up for you to get alerts to keep in touch with the happenings.

<http://www.fda.gov/Food/GuidanceRegulation/FSMA/default.htm>



Bees Exposed to Fungicide More Vulnerable to Nosema Parasite

By Kim Kaplan, USDA ARS

Honey bees that consume pollen that contains amounts of commonly used fungicides at levels too low to cause the bee's death still may leave them more susceptible to infection by a gut parasite, according to U.S. Department of Agriculture (USDA) and University of Maryland research published today in PLOS ONE.

This research complements other recent USDA research into bees, including a comprehensive scientific report on honey bee health issued in May that found multiple factors play a role in honey bee colony declines, including parasites and disease, genetics, poor nutrition and pesticide exposure. The May report specifically highlighted the need for additional research to determine risks presented by pesticides, along with the need for improved collaboration and information sharing.

Researchers from the university and USDA's Agricultural Research Service (ARS) collected pollen samples from honey bees pollinating apples, watermelons, pumpkins, cucumbers, blueberries or cranberries. The scientists then analyzed the pollen to determine how much fungicide, insecticide, miticide and/or herbicide the bees were exposed to while pollinating each of the six crops.

In many cases, the pollen that bees brought back came primarily from plants other than the targeted crop. Some pollen samples contained very few pesticides, but the average number seen in a pollen sample was nine different pesticides, which could include insecticides, herbicides, miticides and fungicides.

Fungicides were the most frequently found chemical substances in the pollen samples. The most common was the fungicide chlorothalonil, which is widely used on apples and other crops. The most common miticide was fluralinate, which beekeepers use to control varroa mites. Neonicotinoid insecticides were only found in pollen from bees foraging on apples.

"Honey bees that were fed pollen that contained the fungicide chlorothalonil and was collected at the hive entrance were almost three times more likely to become infected when exposed to the parasite *Nosema*, compared with control bees," explained study author Jeff Pettis, research leader of the Bee Research Laboratory in



Honey bee landing on a watermelon flower. Honey bee colony losses were substantially down for the winter of 2011-12. Courtesy USDA-ARS by Stephen Ausmus

Beltsville, Md. The lab is part of ARS, USDA's chief intramural scientific research agency.

The fungicide pyraclostrobin, which was found less frequently in the pollen samples, also increased bees' susceptibility to *Nosema* infection.

"Our study highlights the need to closely look at fungicides and bee safety, as fungicides currently are considered safe and can be sprayed during the bloom on many crops," said co-author Dennis vanEngelsdorp with the University of Maryland. "We also need to better understand how pesticides are getting into the hive. Clearly it is not just from collecting pollen from the crops that bees are being used to pollinate."

These findings provide new information useful in understanding the myriad of problems affecting honey bees in the United States, including colony collapse disorder, dwindling honey bee colonies, and other health problems in managed bee colonies, Pettis added.

One unexpected finding was that honey bees collected relatively little pollen from blueberry and cranberry plants, which are both crops that originated in the New World. Despite this lack of pollen collection, researchers know that bees do pollinate these plants. Honey bees were brought to North America from Europe along with Old World crops such as almonds and apples, which co-evolved with honey bees as their pollinators.

Greenhouse Energy Cost Reduction Strategies

Energy Resource Document

NOTE: These publications are available as PDF files for downloading and printing. To view these documents you must have Adobe Acrobat Reader installed.

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**Section 3
Energy-Saving Technologies**

- **Installing Infrared Cauterization Blinds to Save Energy** by Erik Runkle, reprinted from the July 2008 issue of Greenhouse Product News
- **Working with High Energy Prices** by Pennsylvania State University Cooperative Extension
- **Save Heat with Infrared Film** by John Barak, University of Connecticut, reprinted from the December 2008 issue of Greenhouse Management and Production
- **Reduce Fuel Costs with Screens** by John Barak, University of Connecticut, reprinted from the November 2008 issue of Greenhouse Management and Production
- **Curtain Choices** by Patricia Dear, reprinted from the April 2006 issue of Greenhouse Grower
- **How Can You Save Your Greenhouse Energy?** by A.J. Bell, Rutgers University

Greenhouse Energy Savings

Michigan State has a great website that has compiled quite a few articles relating to many aspects of money-saving tips on greenhouse management.

You can find them at

http://www.hrt.msu.edu/energy/Notebook/Energy_Sec3.htm

Greenhouse and High Tunnel Pest Management Programs

Free 6-part Webinar Series

Reducing Pesticide Resistance in Greenhouse Production

In greenhouses, pesticide resistance can lead to over-use of pesticides, as well as a reduction in yields and crop quality due to poor pest control. The topic of pesticide resistance management can be complex, and managing pests in enclosed structures can be challenging. This interactive webinar series will help provide information to greenhouse growers of all sizes on managing pesticide resistance.

This webinar series was developed with our own Cornell experts and will offer practical lessons and tips you can use to better manage pests. The information will be useful for anyone growing in a greenhouse or high tunnel and may also be helpful for other specialty crop growers.

You can view any or all of these 6 Free webinar sessions independently/on your own computer.

3 sessions, Dec. 19, Jan. 3 and 14, will be hosted at CCE Albany County, 24 Martin Road, Voorheesville, NY.

All 6 sessions will be hosted at CCE Orange County, 18 Seward Avenue, 3rd Floor, Middletown, NY.

See below for details on dates and topics.

DEC pesticide recertification credits (1 credit per session) will be given in Categories 1A, 3A, 10, 23, 24 but note that **only participants viewing the live sessions at the extension offices will qualify for recertification credits.** To receive NYS DEC re-certification credits you must bring your license to the training.

To register for webinars at **CCE Albany County** contact Chuck Schmitt cds34@cornell.edu or 518-765-3513.

To register for webinars at **CCE Orange County** contact Cathy Hughes cah94@cornell.edu or 845-344-1234.

For general information on the webinars, and to register to view any of the sessions **independently** contact Brian Eshenaur, CCE IPM Program, bce1@cornell.edu, office 585-461-1000 x240, cell 585-472-6279.

Session	Webcast Date	Topics	Presenters
1	Thursday Dec. 12 2:00-3:00 pm	Pesticide Resistance Basics <ul style="list-style-type: none"> • How resistance gets started • Examples of pests showing resistance in the greenhouse 	Meg McGrath John Sanderson
2	Thursday Dec. 19 2:00-3:00 pm	Pesticide Mode of Action Classes and Rotation Strategies <ul style="list-style-type: none"> • For insecticides • Fungicides 	Margery Daughtrey Dan Gilrein
3	Friday Jan. 3 10:00-11:00 am	Cultural and Sanitation Techniques <ul style="list-style-type: none"> • Reducing pest levels pre, post and mid-crop cycles. 	Betsy Lamb Brian Eshenaur
4	Thursday Jan. 9 2:00-3:00 pm	Insect and Disease Monitoring <ul style="list-style-type: none"> • Yellow Sticky Cards • Where to find Thrips on plants • Early signs of Disease • Where to check first 	Dan Gilrein Brian Eshenaur
5	Tuesday Jan. 14 2:00-3:00 pm	Using Biological Control I <ul style="list-style-type: none"> • Transitioning to biocontrol • White Fly • Fungus gnats 	John Sanderson Betsy Lamb
6	Tuesday Feb. 4 2:00-3:00 pm	Using Biological Control II <ul style="list-style-type: none"> • Disease biocontrol strategy • Bio control viability checks • Thrips 	Margery Daughtrey Dan Gilrein

Crossing Over: Vegetable Diseases in the Ornamental Greenhouse

By A.R. Chase and Margery Daughtrey,
Greenhouse Product News, October 9, 2013

Increasingly, many ornamental growers have chosen to add vegetables and herbs to their product mix. Although the important diseases and arthropod pests of the well-researched vegetable and fruit crops are usually well known, the methods for preventing them or controlling them once they occur are not always easy to implement in an ornamental production system. It is surprising how adding even a well-known crop like tomatoes can complicate production practices immensely for an ornamentals grower. We hope that this article will get you thinking about what you are doing when you make the decision to add a crop to your already complicated ornamental production system.

Some of the pathogens of vegetables are fairly non-specific in their host range and are already an issue in many ornamentals. These cause diseases like Botrytis blight, damping-off (caused by *Pythium* and *Rhizoctonia spp.*) and even some viruses. There are also cases where diseases common to vegetables transfer to ornamentals. Examples of these are late blight on tomato, which can occur on petunia, and powdery mildew on squash and pumpkin, which regularly is found on verbena. Knowing where a problem originates is a critical step in controlling a disease. The exchange of diseases between ornamentals and vegetables is often a surprise to the grower and can result in large losses. Learning when to anticipate a crossover problem can save dollars.

Gray mold is caused primarily by the wide-ranging fungus *Botrytis cinerea* and is very common on dahlia, fuchsia, geranium, cyclamen, exacum, poinsettia, pansy and lisianthus — but really all ornamentals and many vegetable and herb crops can be affected by this non-discriminating fungus. We often see it causing losses in production of plugs and cuttings where humidity reaches a high level. Botrytis blight does look more or less identical regardless of crop, so identifying it on a vegetable or herb should not be too difficult. Watch

for largish brown spots or stem lesions that dry to a tan color. The challenge comes in knowing which of these non-ornamentals are most sensitive to Botrytis and which products can be used to control Botrytis on these crops legally.

Viruses like Impatiens necrotic spot virus (INSV) and Tomato spotted wilt virus (TSWV) have very wide host ranges including hundreds of herbaceous plants (ornamental and vegetable), plus many weeds — and the thrips that move these viruses around do not discriminate particularly between one crop and another. In one

memorable case, we first became aware of TSWV symptoms on tomatoes and peppers in the field, early one summer. The virus source was traced back to a greenhouse grower who supplied the transplants. Within the greenhouse there remained evidence of TSWV on a wide range of flower hosts, including catharanthus, begonia and New Guinea impatiens.

Flower growers have to be on top of their thrips management if they want to provide local farmers with tomato and pepper transplants. TSWV is not transmitted via vegetable seeds, but it is easily spread from infected flower crops to vegetable crops courtesy of the Western flower thrips — those feeding on infected flowers as larvae can spread the contagion to vegetable transplants when they become winged adults. Far from being just an aesthetic problem, TSWV will cause stunted, blemished tomato and pepper fruits that are not salable.

Late Blight

Late blight is a classic disease of potatoes caused by the foliage- and stem-

attacking oomycete, *Phytophthora infestans*. In recent years, the strains of *P. infestans* found in the United States have included some quite harmful to tomatoes but fairly mild on potatoes. So tomato growers (especially those who grow organically) in turn have become savvy about the disease.

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Petunia inoculated with *Phytophthora infestans*, the agent of late blight. Photo by Margot Becktell



Late blight on tomato.

Crossing Over, continued from page 6

Enter the greenhouse flower industry, seeking to capitalize on the new craze among homeowners for healthy edibles grown on their own doorstep. Although ordinarily most of the plug production for the Northeast is supplied by northern greenhouses, there has been a historical tendency for the vegetable production industry to use a lot of southern grown transplants. In 2009, a good proportion of tomato plugs for the homeowner market were produced in the south, while growers in the northern United States finished the crop for sale to big box stores or independent retailers. Ordinarily overwintering of *P. infestans* isn't a problem on tomatoes in most production areas, because the pathogen isn't carried over on tomato seed, and the plants themselves don't manage to overwinter in areas where temperatures go below freezing. But weather shifts and changes in the pathogen strains have increased the opportunity for *P. infestans* that overwinters in south Florida to work its way north to connect to early-season production in areas protected from overwintering by frost.

Because of all these interacting factors, in spring 2009, the greenhouse industry inadvertently shipped some tomato plugs with late blight up to northern greenhouses for finishing. The finishers, in turn, shipped some infected tomatoes to their customers, because they did not recognize the signs of late blight disease.

Because of a wet spring that encouraged disease spread and development at box stores and garden centers, soon there were local epidemics of late blight all over the Northeast and Mid-Atlantic states. Homeowners' plants became inoculum for disease outbreaks at nearby farms, triggering the need for expensive treatment programs for conventional growers. Unique weather features contributed to the extensiveness of the 2009 disease outbreaks, but the extent of the problem could have been reduced if the flower industry had been alert to the particular disease threats associated with tomato growing. Even though its appearance on petunias is

a rare event, it's important not to forget that late blight can also affect petunias — suspicious symptoms on petunias should always be properly diagnosed.

Tobacco Mosaic Virus

On top of the need to be wary of potential late blight symptoms, being on the alert for Tobacco mosaic virus (TMV) is especially important for petunia growers who also produce tomatoes. Many of the commercial varieties of tomatoes grown today have resistance to TMV (and other diseases) — but the increasingly popular “heirloom” varieties of tomatoes do not have these resistance features. A greenhouse flower grower supplying heirloom tomato transplants to farmers could create a disastrous disease problem if TMV-contaminated petunias were brought into

contact with the tomatoes during production! TMV-affected tomatoes may have distorted or mottled foliage as well as reduced yield and poor fruit quality, including uneven ripening and gray interior walls. Because TMV is spread merely by handling, it is particularly likely to be moved from flowers to vegetables or vice versa. Many other viruses can infect herbaceous perennials and vegetables, moving freely back and forth and making control strategies very tough to implement. For example, Cucumber mosaic virus (CMV) and Alfalfa mosaic virus (AMV) have both vegetable and flower crops on their menu; if unfamiliar symptoms are seen on a flower crop, diagnosis may be important for the sake of vegetables in the same greenhouse.

Cucurbit Powdery Mildew

Growers who produce cucurbits as well as verbenas need to be aware of potential crossing over of powdery mildew from vegetables to flowers or vice versa. The usual direction is that verbenas overwintered in the

greenhouse may be inconspicuously infected on their lower leaves with powdery mildew (*Podosphaera xanthii*). This problem may go unnoticed until cucumbers or zucchini are started in the greenhouse in the spring; air movement is enough to transfer spores from flower to



Tomato spotted wilt virus symptoms on tomato.



Tomato spotted wilt virus symptoms on New Guinea impatiens.

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vegetable. In other cases, the vegetative cuttings used to propagate some verbenas may be infected with powdery mildew, starting a potential outbreak of the disease on cucurbits without any need for over-wintered verbenas. The chemicals labeled for use on greenhouse ornamentals for powdery mildew control are not usually labeled for use on edible greenhouse crops, so a spring powdery mildew epidemic can present a real management challenge. Keeping cucurbit (squash family) crops physically separate from verbenas is a good policy.

Conclusions

The diseases of vegetables and herbs have become increasingly relevant to the greenhouse grower, who may have plenty of knowledge about ornamental diseases, but know precious little about these “new” crops. Our advice is that you not expand into edible plant culture blindly.

Keep edibles separate from ornamentals wherever possible, so that problems will have less opportunity to move from vegetatively-propagated ornamentals to seed-propagated edibles. Separation also makes it easier to use different materials for control in ornamental vs. edible growing areas. Starting vegetables in separate (and very clean) houses might protect them from early contact with Western flower thrips that could be infesting flowering crops elsewhere on your premises. Western flower thrips will move readily between ornamentals and edibles, transmitting TSWV or INSV to bell peppers, for example, if the virus has previously been acquired from a diseased ornamental. Tomato crops should be raised away from flowering solanaceous crops (petunia) as these might be the source for TMV or late blight. Think of vegetable and herb production as a specialty that requires more research and consideration than you might expect, and you will be rewarded with successful culture of these popular crops.

Winter Reading and Viewing

By Amy Ivy, ENYCHP

Winter is a great time to catch up on reading. I love a chance to curl up in a comfortable chair with a blanket and a book while the wind howls outside. Escape fiction is one reading option but you might also consider some more technical reading material as well. Chances are good your bookshelves have at least a few titles you've been meaning to crack open; now is your chance.

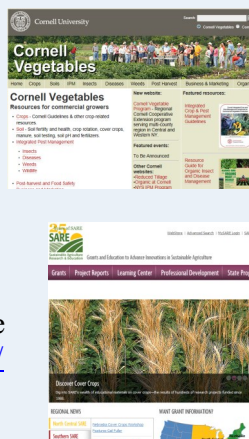
Along with hard copy books you can also perch a laptop computer on well, your lap, and spend many more hours that you thought possible perusing all the good information that's available on-line now. If you don't have high speed access at home, take your laptop to your local library or coffee shop and use their free wifi access.

There are hundreds of sites to visit, but here are some that are based from or associated with Cornell to get you started. I am cautious about advice from sites that end in '.com' since those have a product to sell. Look for sites that end in '.edu' for education or '.org' instead, at least as a place to begin.

Here are a few:

Cornell's Vegetables website <http://www.vegetables.cornell.edu/> has sections on Crops, Soils, IPM, Insects, Diseases, Weeds, Post-Harvest Handling and GAPs, Business and Marketing, and Organic Production Guidelines.

At the SARE (Sustainable Agriculture Research & Education) website <http://www.sare.org/> click on the

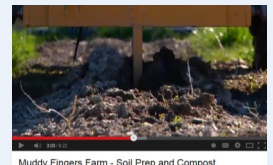


“Learning Center” tab to find a huge collection of resources including books, bulletins and newsletters. Click on ‘Multi Media’ to find a collection of videos.

Cornell's Small Farms Program's website <http://smallfarms.cornell.edu> is another excellent reference, with plenty of reading and watching to make the winter speed by. Their guides and booklets are listed there and are available for free downloading so you can save them on your computer.

Some video clips from the Small Farms YouTube site include (*video images are clickable*):

Muddy Fingers Farm (Hector, NY) – Soil Prep and Compost: <http://www.youtube.com/watch?v=5Cl6SBCMnh0>



Muddy Fingers Farm - Soil Prep and Compost

Silver Queen Farm (Trumansburg, NY) – Planting Strawberries: <http://www.youtube.com/watch?v=laDLh3oj0EI>



Silver Queen Farm: Planting Strawberries (1 of 2)

Silver Queen Farm – Planting Raspberries: <http://www.youtube.com/watch?v=W-BbpmTIA>



Silver Queen Farm: Planting Raspberries

Silver Queen Farm - Irrigation: http://www.youtube.com/watch?v=6u_UoLy2xLw



Silver Queen Farm: Irrigation

Capturing Money Using Quickbooks - Hands-On Workshop

Hands-on workshop for farmers to learn how to use Quickbooks for recordkeeping

Dec. 13, Dec. 20 and Jan. 3 at two locations

(Jan. 10 being held as a snow date)

CCE Washington County, 415 Lower Main St, Hudson Falls, NY from 12:30 to 3:00 pm

CCE of Albany County, 24 Martin Road, Voorheesville, NY from 6:00 to 8:30 pm

Is your current farm record keeping system useful and meeting your needs?

How easy is it to use routinely? Can you get customized reports to help you better fine tune business decisions?

If you have lingering questions about how good your record keeping system is, consider attending this workshop. A case farm will be used as an example throughout the class to give you a sense of how to use Quickbooks in your own business.

After taking this workshop, you will have a beginning working knowledge of this useful computer program, including:

- How to set up a chart of accounts to track income and expenses
- How to set up and automate entering of routine monthly bills (such as milk check)
- How to modify some reports to make them meaningful for you
- How to generate useful financial reports to monitor and track your business.
- How to use Quickbooks to capture direct marketing sales easily.

Those that attend are encouraged to come a half hour early and bring something to eat if they wish. Sandy Buxton and Steve Hadcock will be there to answer questions you might have relative to using Quickbooks.

The cost is \$50 per farm for up to two people.

Space is limited at each workshop site so register early!

Register online at https://reg.cce.cornell.edu/FarmerQuickbooksWorkshop_201
or contact Gale Kohler at 518-765-3579 or at gek4@cornell.edu.

*Cornell Cooperative Extension of
Capital Area Agricultural and Horticultural Program
provides equal program and employment opportunities.*

Maintenance, Cleaning and Storage of Ground Sprayers

Below is a fact sheet from Montana State. The information is equally useful in New York. -Maire Ullrich, ENYCHP

By Reeves Petroff, Pesticide Education Specialist, and Dr. Greg Johnson, Entomology Department Head. Montana State Univ. Extension, MontGuide #MT198917AG

The spraying season in Montana offers such a limited window of opportunity that you can't afford to lose extra days getting your spray equipment into shape. Proper maintenance and storage techniques not only streamline next year's preseason preparations, but also enhance sprayer performance while adding years to its productive life.

Long-term exposure to many pesticides that pass through a sprayer can corrode and deteriorate sprayer parts, paint and electrical connections. The residue from these products may be harmful to anyone working on or around the machine. Also, trace amounts of pesticides lodged in sprayer parts may damage crops if carried over to the next spraying season.

Your personal safety and that of your family, employees and your crops make it important that you thoroughly clean and decontaminate your sprayer during the season, between crops and before you store it for the winter.

A complete maintenance and storage process consists of six steps:

- | | |
|----------|------------|
| 1. Read | 4. Clean |
| 2. Rinse | 5. Inspect |
| 3. Drain | 6. Store |

1. Read

Before you begin cleaning your sprayer, be sure to review the label of the pesticides you've applied. The label will:

- Tell you how to properly dispose of residual product.
- Provide any special cleaning instructions that might be necessary.
- Recommend decontaminating products.
- Outline the Personal Protective Equipment (PPE) you need to safely clean your sprayer.

2. Rinse

The goal of rinsing is to remove any concentrated or large areas of the product that might still be in or on the sprayer.

Cleaning spray equipment involves circulating water through the whole system and then applying it to a site that is listed on the label of the pesticides you have used. Several rinses using a small volume (up to 10 percent of the spray tank capacity) are better than merely filling the spray tank once with clean water. Select a location where the rinsate will not contaminate water supplies, streams,

crops or other plants and where large puddles won't accumulate, creating a hazard to humans, animals and the environment.

Preferably, the area should be impervious to water and have a wash rack or cement apron with a sump to catch contaminated wash water and pesticides.

Make sure that you drain the spray tank in a manner consistent with the pesticide label. Don't just open the valves and let it pour on the ground.

Add larger volume nozzle tips for a faster and legal method to dispose of sprayer rinsate.

The outside of the sprayer should also be washed. For this purpose, applicators are encouraged to have a source of water on the sprayer in order to rinse down the sprayer in the field on a regular basis. Again, when rinsing the sprayer, do not create standing puddles that might be accessible to children, pets, livestock or wildlife.

3. Drain

To dispose of pesticide rinsate in accordance with label directions, apply the rinsate to a site where the products are to be used originally. In other words, the site must be listed on the label. Repeat the draining process after decontaminating and re-rinsing the sprayer. Make sure that you also drain any clean water rinse tanks prior to storage to avoid damage caused by water freezing inside.

4. Clean

After your sprayer has been rinsed and drained, it's time to clean or decontaminate it.

Be sure to decontaminate both the interior and exterior of the machine, running liquid through the boom structure and out the nozzles. You don't need to fill the sprayer. Use only enough cleaning solution to completely fill the lines and provide enough agitation. You may need to scrub or power wash the inside of the tank. Wear your personal protective equipment (PPE).

Select cleaning agents based on the pesticide and formulation used (see Table 1). Cleaning agents should penetrate and dissolve pesticide residues and allow them to be removed when the rinsate is removed from the sprayer. Commercial tank cleaning agents and detergents help remove both water- and oil-soluble herbicides and are recommended on many pesticide labels.

Some tank cleaning agents and ammonia solutions raise the pH of the rinsate solution, making some products such as sulfonyleurea (SU) herbicides more water soluble and thus easier to remove from internal sprayer parts.

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Chlorine bleach solutions hasten the breakdown of SU's and some other herbicides into inactive compounds. However, chlorine is less effective at dissolving and removing SU herbicide residues from spray tanks than ammonia solutions. Never add chlorine bleach to ammonia or liquid fertilizers containing ammonia, because the two materials react to form toxic chlorine gas.

Fuel oil or kerosene is effective for removing oil-soluble herbicides such as esters and emulsifiable concentrates. The fuel oil or kerosene should be followed by a detergent rinse to remove the oily residue. Also run cleaning solution throughout the sprayer, including the agitation system and the return lines. Then rinse the system with clean water. Open all nozzles until they are spraying pure water.

5. Inspect

After the final rinse you can inspect your sprayer and make the necessary repairs and modifications. **Even though the sprayer has been "cleaned," always wear personal protective equipment.** Some residue may remain on and in the sprayer.

Here is a checklist of what to look for both during and after cleaning:

- Mismatched and worn nozzles
- Damaged nozzle screens
- Damaged strainer screens
- Cracks, leaks and overall performance in the pump.
- Hose condition, especially brittleness or cracks
- Valve condition, identifying any possible leaks or areas where seals may have loosened
- Boom structure, identifying cracks that must be fixed

Modifications

Some handy modifications might be:

- Shut-off valves on either side of the pump to facilitate pump removal and repair
- Shut-off valves at the boom
- Shut-off valves at the tank
- Additional pressure gauges
- Installing flowmeters
- Installing tank level indicators
- By-pass and agitation lines
- Engine-kill switches
- Additional lines to aid in cleaning, i.e. broadjets for spraying out rinsate as opposed to using boom

6. Store

Now that the sprayer has been thoroughly cleaned, you may want to remove parts of it that may be damaged during storage.

- Remove strainers (filters) and wash them by hand with soapy water (remember to wear chemical-resistant gloves), rinse them and either store them or place them back in the sprayer.
- Pay special attention to nozzles, nozzle bodies and check valves. Chemical residue can build up in these areas and harden over winter, dramatically reducing the sprayer's performance next season.
- Remove nozzle tips, screens, check valves, caps and nozzle bodies from the nozzle body assemblies. Correctly plug the assemblies.
- Clean and rinse out the nozzle tips, nozzle bodies and check valves. Store in a marked container. Store check valves at room temperature over the winter to avoid damage that can be caused by freezing temperatures.
- Remove all pressure gauges and cap the openings on the sprayer. Store the gauges where they are not subjected to freezing or damage.

Finally, circulate antifreeze through the sprayer and all plumbing, including booms, valves, manifolds, flowmeters and agitation/return lines. Allow the antifreeze to circulate through the boom's hoses. This will coat the hose linings to prevent drying out and cracking. Capping all boom nozzles will help retain the antifreeze in the system, but you may need to open one or two nozzles to allow the antifreeze to circulate through the boom. Cap those nozzles when antifreeze has completely filled the system.

The goal for the storage phase is for the antifreeze to push out residual water that may be in the system and to coat all of the sprayer's components. Allow the antifreeze to sit in the pump and valves to avoid rusting and damage that can be caused by moist air being trapped in the system. Since some applicators remove the pump prior to storage, the installation of shut-off valves on either side of the pump can facilitate this process.

Anti-freeze for recreational vehicles (RV's) is commonly used for storage of agricultural sprayers. Unlike automotive antifreeze, it is less toxic to animals. While many RV antifreeze products will gel in extremely cold conditions, they should not freeze. Regardless, always read the antifreeze label to make sure it will perform under your winter conditions.

Now that the sprayer has been cleaned, decontaminated and winterized, it's ready to be stored. Obviously, indoor storage, away from the abuse of the elements, is preferable. But any indoor site you pick should be far

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away from both liquid and dry fertilizers. The dust and residue from these products can corrode both paint and hardware on the sprayer.

If you have a spray monitor, remove the display pad from the cab and store it in a warm, dry place.

Don't forget foam markers and flowmeters

When cleaning and winterizing your sprayer, don't overlook the foam marker system and any flowmeters. Start with the marker system. Simply disassemble the foam generators, then clean residue from the mixing filters and screens using clean water and the appropriate cleaning solution. Consult the manufacturer's instructions of your foam marker to determine if specialized cleaning solutions are needed.

If you don't clean out the spongy mixing filter, the residual foaming agent may harden, making it nearly impossible to clean later.

To clean the flowmeter, follow procedures outlined in the manufacturer's instructions. Otherwise, use the following procedure where applicable. Be sure to determine if any warranties are affected.

- Disconnect the wiring harness from the electrical connector on the sensor.

- Unscrew the flowmeter insert and remove.
- Clean insert with clean, soapy water. Make sure the turbine turns easily. If it doesn't, clean again.
- Reinstall insert in flowmeter.
- Attach electrical connector to sensor

Maintaining sprayer equipment

Maintenance of pesticide application equipment includes regular inspection of the spray tank, pump, hoses, line strainers, pressure gauge, fittings, nozzle tips and strainers. Check the sprayer prior to and following extended storage, and before each use. **Remember to always wear personal protective equipment when handling spray equipment.**

Spray tanks

Spray tanks are made of stainless or galvanized steel, fiberglass or plastic, including polyethylene or polypropylene. These materials are fairly non-absorptive, so no pesticide residues should be left in them after being cleaned. However, fiberglass tank linings, if scratched, will absorb pesticides. Cracks and chips in the epoxy coating of galvanized tanks must be repaired with epoxy material; otherwise, the exposed metal may corrode. Periodically check tanks for cracks, rust or corrosion that will weaken the tank and eventually develop into a leak.

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Table 1. Cleaning Solutions for Pesticides

Pesticide Used	25 Gallons Cleaning Solution	2.5 Gallons Cleaning Solution	Instructions
Hormone herbicides, ester form. (brush killers, dicamba MCPA)	1 Qt. household ammonia	½ cup household ammonia	Agitate solution 10-15 min., flush small amount through system and let remainder stand overnight. Flush and rinse with clean water.
	OR	OR	
	2 lb. trisodium phosphate	¼ lb. trisodium phosphate	Same as above except let stand for a least 2 hours.
	OR	OR	
	½ lb. fine activated charcoal + ½ cup powder detergent*	2 Tablespoons fine activated charcoal and 1-2 oz. powder detergent	Agitate, operate sprayer for 2 min., let remainder stand for 10 min., then flush through sprayer. Rinse with clean water.
Hormone herbicides, ester form (2,4-D, brush killers, MCPA)	1 lb. washing soda (sal soda) + 1 gal kerosene + ¼ lb/ powder detergent*	4 oz. washing soda (sal soda) + 1½ cups kerosene + 1 Table - spoon powder detergent*	Rinse inside of tank and flush small amount through system. Let stand at least 2 hours. Flush and rinse with clean water.
Other herbicides (atrazine, simazine, alachlor)	¼ lb powder detergent*	1 Tablespoon powder detergent*	Rinse with clean water before and after using sudsy solution.
Insecticides**, fungicides	¼ lb powder detergent	1 Tablespoon powder detergent	Agitate, flush and/or rinse.

* Liquid detergent may be substituted for powder detergent: mix at a rate to make a sudsy solution

** Organophosphate and carbamate insecticides may also be detoxified by adding household ammonia to the cleaning solution (1 qt. per 25 gallons or ½ cup per 2.5 gallons).

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Make sure the spray tank is securely fastened to the sprayer.

Pump and pump seals

The pump and all its components must be in good working condition. Pump seals, 'O' rings or cup washers of leather or synthetic material may dry out and shrink if the sprayer has not been used for an extended period or stored improperly. The solvents in some pesticide formulations can damage pump seals, resulting in leaks around the pump or inefficient pumping.

Hoses

Replace hoses that are cracked or leaking. Remember, hoses used to apply pesticides can never be completely decontaminated. There will always be some pesticide residue left in them. Those that are replaced must be properly disposed of and not reused for any other purpose.

Line strainers and screens

Always use strainers and screens when the equipment is in operation. These filter out debris and foreign particles that can plug nozzles and reduce sprayer performance.

Pressure gauges

Fluid pressure in the spray system is monitored by a pressure gauge. The gauge measures spray pressure through the nozzles when located between the pressure regulator and the spray nozzles. Consequently, a change in pressure can mean a potential malfunction. Make sure pressure gauges are in good working condition and properly calibrated.

Fittings and clamps

Loose or cracked fittings are frequently a source of leaks. Make sure fittings and clamps are snug prior to putting the system under pressure and pumping liquid. Once the system is under pressure, check for leaks.

Nozzle tips and strainers

Check nozzles routinely to make sure they are not plugged. Worn nozzles mean more chemical sprayed and often result in an irregular spray pattern and inconsistent results. Nozzle openings may also change, especially when abrasive formulations, such as wetttable powders, are frequently used.

Replace them when wear causes flow to exceed that of a new tip by five to 10 percent.

For example, suppose the nozzle tip manufacturer states that your particular nozzle tips should provide 50 ounces of flow per minute at 30 pounds per square inch (psi). You want to use an error range of 10 percent (0.10). By using a calculator, simply multiply 50 x 0.10 and add to 50 to find the upper limit; 50 ounces x 0.10 = 5 ounces. Then 5 ounces + 50 ounces = 55 ounces.

Now subtract 5 ounces from 50 ounces to find the lower limit; 50 ounces - 5 ounces = 45 ounces. Any flow at 30 psi that is between 45 and 55 ounces of flow per minute is acceptable. Anything above 55 ounces or below 45 ounces per minute is not acceptable and you may consider changing the nozzle tips.

If nozzle flow is less than expected, clean the nozzles and try again. The nozzles may only be plugged.

Extensive Soil Mix Studies for Greenhouse Production of Seedlings and Transplants

By Neil S. Mattson, Associate Professor and Floriculture Extension Specialist, and Stephanie A. Beeks, Graduate Student, Cornell University Department of Horticulture

In the Cornell greenhouse program we have been studying the characteristics that make up good quality potting mixes for production of vegetable seedlings and transplants. Both conventional and organic potting mixes have been studied, but in our most recent work which we will describe here our objective was to compare different commercially or locally available organic substrates for use in seedling germination (200 plug trays with a 20 mL volume per cell) or in 4-inch container transplants (500 mL volume per pot). We have noticed an increased interest in organic production methods and locally prepared potting mixes. However as compared to conventional mixes, organic mixes can be more challenging to manage fertility, pH, and salts. Many organic potting mixes have enough

fertility to support sufficient plant growth for about the first 4 weeks; these mixes seem to be preferred by organic growers to avoid the expense and labor of supplementing with additional fertility. Therefore in our trial we did not add additional fertilizers to see how the mixes would perform on their own. If necessary, additional fertility can be added by top-dressing granular materials or using liquid products. We have had success with many organic fertilizers in our trials.

The mixes trialed in this study included: Sun Gro Sunshine Natural & Organic #1 (Sun 1) and #4 (Sun 4), Sun Gro Metro-Mix Natural and Organic PX-2, a Cornell vermicompost mix (Cor), an Ithaca locally formulated mix (Ith), Vermont Compost Fort Lite (VFL) and Fort Vee (VFV), and McEnroe Organic Premium Lite (MOPL). All these mixes were acceptable for certified organic

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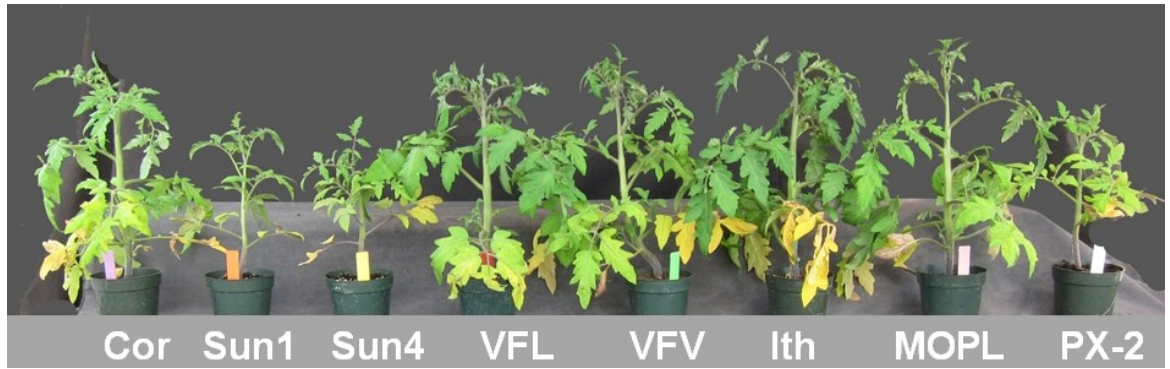
production. The Cornell vermicompost mix was, by volume, 70% peat, 35% coarse perlite and 5% vermicompost (Worm Power LLC, Avon, NY). To this we added 2.5 lbs./yd³ dolomitic limestone

(more can be used if the irrigation water is low in alkalinity), 5 lbs./yd³ each of green sand and rock phosphate and 3.5 5 lbs./yd³. The Ith mix was formulated by a local grower in Ithaca, New York and was made of compost, peat, coconut coir, perlite and other aggregates and a poultry litter fertilizer. All plants were grown in a glass greenhouse at Cornell University at 70 °F average daily temperature.

In the seedling germination trial seeds of tomato ('Celebrity' untreated) and pepper ('Declaration' untreated) were sown on the 200 cell trays with 3 replications per substrate treatment. After 4 weeks the experiment was terminated. Germination percentage was determined and the dry weight of 10 combined representative seedlings from a tray was measured.

For the transplant experiment plugs (well-rooted 4-5 week old seedlings) of ('Celebrity' untreated) and pepper ('Declaration' untreated) were transplanted into 4-inch containers. There were 10 replicate plants for each substrate treatment. Each week leachate samples were taken from 5 randomly selected containers from each substrate treatment and sampled for pH and EC (electrical conductivity, i.e. soluble salts - a measure of fertilizer and non-fertilizer salts). After 4 weeks the experiment was terminated. Plant height and dry weight were determined.

Seedling germination percentages and dry weights from the seedling experiment are reported in Table 2.



Tomatoes in the 4-inch container transplant experiment

Germination of pepper was significantly reduced and very poor from the Ith substrate. This appears to be due to high salts and immature compost in that mix. Size of pepper plants was greatest for the VFL, VFV and MOPL mixes. For tomato trial the germination percentage was greatest for Sun 1 (not significantly different from Sun 4). Ith and Cor mixes had the lowest germination percentage and these were not significantly different from VFL or MOPL. For tomato, the greatest dry weight was found with Cor, MOPL, VFV and VFL. Germination and growth of peppers seems to be negatively affected by high pH of mixes (>6.5) and high EC. Tomato has heavier fertilizer requirements and appears to be less affected by substrate pH and high ammonium in fresh compost.

For the 4-inch container transplant experiment, plant height and dry weights are reported in table 3. Many of the substrates had pH levels above the desirable range during the 4 week production period (optimum during production is 5.5-6.5). Substrate pH increased over time due to our moderately alkaline irrigation water at Cornell University. By three weeks after experiment initiation EC levels of containers had all dropped indicating that nutrients were being consumed by the plant or leached out of the substrate. For pepper, plant size was similar for the VFL, VFV, MOPL, Ith and Cor mixes. However, the Ith mix gave variable growth of plants. Plants were significantly smaller with Sun 1, Sun 2, and PX-2 mixes. For tomato,

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Table 1. Analysis of substrates using the saturated media extract method. Preferred range is as reported by the J.R. Peters laboratory

	pH	Soluble Salts (mmhos/cm)	NO3-N	NH4-N	P	K	Ca	Mg	Na	Cl
			----- ppm -----							
Sun 1	6.6	0.43	15	13	5	15	27	17	17	44
Sun 4	6.7	0.52	16	19	10	27	25	15	28	52
PX-2	5.5	1.97	32	18	35	239	112	77	28	58
Cor	5.2	0.48	9	27	13	38	9	5	28	52
Ith	7.1	1.37	2	41	68	215	18	6	77	172
VFL	5.3	3.7	270	3	30	315	347	91	210	180
VFF	5.9	3.37	263	2	21	293	282	71	180	179
MOPL	5.7	3.8	277	1	35	331	390	168	87	120
<i>Preferred Range</i>	<i>5.2-6.3</i>	<i>0.75-3.5</i>	<i>35-180</i>	<i>0-20</i>	<i>5-50</i>	<i>35-300</i>	<i>40-200</i>	<i>20-100</i>	<i>N/A</i>	<i>N/A</i>

Soil Mix Studies - Greenhouse Seedlings and Transplants, continued from page 14

plant size was greatest for the Ith mix, followed closely by VFV, VFL, MOPL, and Cor. Again plants were significantly smaller with Sun 1, Sun 2, and PX-2 – these mixes had much lighter starter nutrient charge than the other mixes. For optimal plant growth additional organic fertility will need to be added soon after transplanting when using these mixes; while the other mixes tested appear to be suitable for pepper and tomato transplant growth in 4-inch containers at least for 4 weeks.

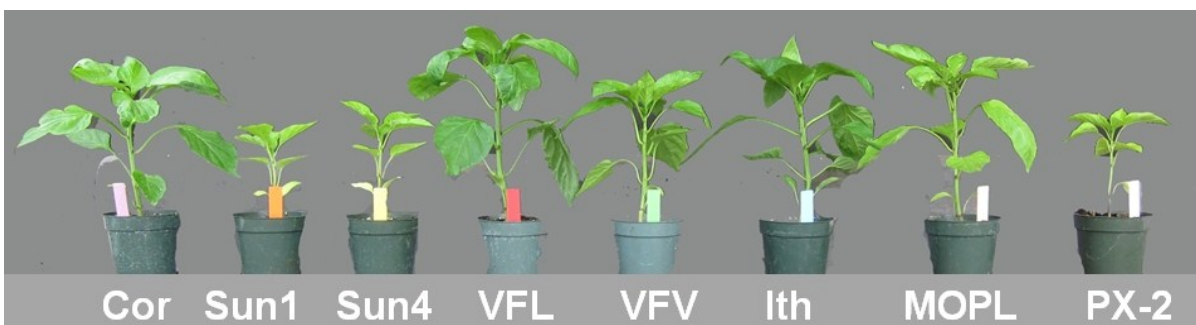
While we tested the same mixes for both seedling and transplant production, many growers prefer to use separate mixes for these two activities. A more finely textured mix is usually chosen for seedling germination to ensure constant water supply to the germinating seed. However decent aeration of the substrate is still necessary for both

Table 2. Germination percentage and plant size of pepper and tomato seedlings in response to different organic substrates. Within each column, values followed by the same letter are not significantly different from each other.

	Germination percentage		Dry weight of 10 seedlings (g)	
	Pepper	Tomato	Pepper	Tomato
Sun 1	91% A	90% A	0.10 A	0.33 AB
Sun 4	73 A	85 A	0.17 A	0.19 B
Cor	77 A	60 D	0.40 A	0.69 A
Ith	21 B	46 D	0.15 A	0.60 AB
VFL	87 A	72 CD	0.35 A	0.70 A
VFV	92 A	63 BC	0.33 A	0.77 A
MOPL	71 A	72 CD	0.27 A	0.75 A

biological processes to convert organically bound nutrients into a plant available form. Conditions that promote microbial activity include warm temperatures, a well-aerated root-zone and a balanced pH. Therefore nutrient release rates of a given fertilizer will vary from operation to operation based on their growing conditions. We expect

that our experiences in a well-heated greenhouse (70 °F) may differ from growers if cooler temperatures are used.



Peppers in the 4-inch container transplant experiment

Work is in progress at Cornell to compare the performance of

seedling and germination mixes (i.e. they should not be too water logged as roots need oxygen). When comparing the seedling to the container trials, the seedlings were more sensitive to mixes high in EC whereas the 4-inch transplants were able to take advantage of the added fertility in these high EC mixes.

several different granular organic fertilizers on 4-inch tomato transplants at average daily temperatures of 50, 60, and 70 °F. Our initial results indicate that these fertilizers perform well (with some minor differences) at 60 and 70 ° F, but plant growth and nutrient availability was really reduced at 50 °F.

To follow up the 4-inch transplant experiment we wanted to see if we could use a granular organic fertilizer, Sustane 8-4-4, to improve the fertility and plant performance of a low fertility mix (Sun 4). Sustane 8-4-4 was incorporated into the potting mix prior to transplanting pepper and tomato seedlings at a rate of 0, 5, 10, 15, and 20 lbs/yd³. Sustane 8-4-4 successfully grew nice size transplants with optimal fertilizer rates of 5 lbs/ yd³ for pepper and 10 lbs/yd³ for tomato.

Organic supplied nutrients are primarily slow release and depend on

Table 3. Plant height and dry weight of pepper and tomato transplants grown in 4-inch containers in response to different organic substrates. Within each column, values followed by the same letter are not significantly different from each other.

	Plant height (cm)		Plant dry weight (g)	
	Pepper	Tomato	Pepper	Tomato
Sun 1	14.6 C	22.3 B	0.60 B	1.63 D
Sun 4	14.6 C	22.5 B	0.59 B	1.95 D
PX-2	16.0 C	24.5 B	0.72 B	2.57 D
Cor	20.3 B	31.6 A	2.22 AB	6.76 C
Ith	22.1 AB	31.8 A	5.28 A	9.76 A
VFL	24.8 A	32.1 A	2.51 AB	8.21 B
VFV	19.4 B	33.2 A	2.12 AB	7.88 BC
MOPL	21.6 B	32.5 A	2.48 AB	8.48 AB

Elements of a Good Farm Lease

By Maire Ullrich, ENYCHP

In November, I went to an American Farmland Trust conference on farm transfer and brought back lots of information. One of the best sessions was on land leasing. This information is good for landowners and new farmers looking for a spot to farm. This information was provided by Land for Good, <http://landforgood.org/> with a few edits based on information I gathered at the session. Their website is brimming with great information for farmers of all stages of business.

1. **The Parties** – Be clear about the identities of the landlord and the tenant. The lease should specify whether the party is an individual, LLC, corporation, or some other entity.
2. **Description of the Property** – The description should be sufficient to allow a stranger to identify the location of the property. The description should include the address, a map, and relevant specifics about the parcels being leased. A description of the initial condition of the property, including any structures, should be included. Typically, a dwelling should be leased separately, with the property immediately surrounding it as part of the residential lease.
3. **Duration of the Lease** – The start and end dates, and options for extension or renewal. The lease should also state whether it stays with the property if ownership transfers due to sale or settling an estate.
4. **Rent** -- Payment must be specified, even if it is no cost. There are various ways to calculate the rent. In a non-cash agreement, the type and frequency of services or the crop-share amount should be specified. If there are penalties (e.g., interest) for a late payment, those should be specified as well.
 - a. Rental rates can vary. Usually there are local “going rates” based on soil types, field conditions and location. Rental can be set somewhat arbitrarily at 150-200% land tax, specifying whether it is ag assessed or not, and that responsibility for applying for ag rates falls on the landowner. Another formula would be to set rent at 20% of the appraised sale value. Either way, the rent should always include the DIRT 5 factors: depreciation, interest, repair, taxes and insurance.
 - b. Rental agreements may also be quite flexible to offset for maintenance and improvements. Maybe rental rates are reduced by 20% but the renter must do soil sampling every 3 years and lime accordingly to maintain field fertility for the landowner.
5. **Taxes** – Responsibility for property and any other tax payments should be specified.
6. **Utilities** – The lease should specify who is responsible for utility bills and what entity will be named on each utility account.
7. **Permitted and Prohibited Uses** – This is an important section. The lease should clearly define the permitted and prohibited uses of the property. What kinds of farming will be allowed? What counts as agriculture? Does a cordwood operation qualify as agriculture? Commercial composting? A corn maze? Aquaculture? Definitions and perceptions of farming evolve, so it’s important to be both clear and flexible. Address whether farm-related education or non-agricultural uses such as recreation will be permitted. A landowner may also prohibit certain activities, e.g., removing trees or gravel.
 - a. Landowners may want to specify whether the land is to be limited to certain types of production, for example, only pasture or hay land, or to other restrictions or requirements regarding uses appropriate to the soils or topography of the farm. A map indicating where certain practices are allowed or prohibited is useful. It’s recommended to include a process for the tenant to request permission or clarification regarding uses. For example, the lease may say that removing trees is prohibited except as approved by the landowner in response to a written request by the tenant.
 - b. Be sure to state in the agreement that all uses are to be in compliance with local, state and federal regulations and permitting.
8. **Entry** – The lease should specify whether the landowner has permission to enter the property, and if there are limitations to such entry. For example, requiring the landowner to give 24 hours notice about a visit. Can landlord’s family members walk or picnic on the leased property?
9. **Maintenance and Repairs** – The lease should specify who is responsible for maintaining and making repairs to the land and any structures included in the lease, such as fences, buildings, storage structures, roads and irrigation systems. Repairs and maintenance are fertile areas for disagreements and disappointments between landowner and farm tenant. The distinctions among maintenance, repairs and improvements should be spelled out as clearly as possible. Typically the tenant is responsible for basic maintenance and routine repairs. The landlord is usually responsible for major repairs, rehabilitation, and replacement of farm

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Elements of a Good Farm Lease, continued from page 16

- structures or systems. A process spelled out in the lease for the parties to decide when there is some question can save miscommunication and tension down the road.
10. **Alterations and Improvements** -- The lease should specify who is responsible for improvements such as new structures or major alterations, along with the process for approval, and who bears the cost. It should specify whether such improvements are considered permanent fixtures and become the property of the landowner (compensating the tenant or not) or whether they may be removed by the tenant at the end of the term. Remember to work in what happens to improvements paid for by NRCS or FSA. Large projects can be quite costly and a landowner having to reimburse a renter for money that was part of a USDA program project could be excessive.
 11. **Stewardship and Conservation** – In this clause, the parties can specify what practices may be required or encouraged. Often it's good to reference a separate stewardship plan as an attachment to the lease. The plan can be reviewed and revised annually. A lease may specifically encourage or require the development of a conservation management plan, a waste management plan, or a grassland habitat management plan.
 12. **Subletting** – The lease may specify whether subletting is permitted and under what conditions. Farm leases typically do not allow subletting without some controls by the landowner such as prior review and approval of the sublease terms and sub-tenant. Be clear about non-farm subletting such as tenant allowing folks to set trailers on the property for additional income.
 13. **Termination** – The lease should indicate the procedure for either party to terminate the lease. Tenants should always have a reasonable exit option. The lease should specify if and when notice must be given. On longer-term leases, the ability of the landlord to terminate without just cause should be limited, otherwise the long-term nature of the lease is undermined.
 14. **Default** – The lease should specify what constitutes default by tenant or landowner. Default means that one of the parties to the lease has violated a term by failing to do something or by doing something not permitted by the lease. The lease should allow for the party to remedy the default, such as to pay the late rent or clean up a pile of trash, and address any damages resulting from the default.
 15. **Monitoring and Reporting** – The lease should specify how monitoring will be handled, whether there will be reporting between the farmer and landowner and what form such reporting would take. There may be a schedule of monitoring visits. The landowner may want someone familiar with farming to do the monitoring—a farming friend or a professional, for example.
 16. **Insurance and Liability** – The lease should require the tenant to carry liability insurance, typically indemnifying the landowner. The landowner may carry casualty insurance on the structures. The lease should specify what will happen in the event the property is condemned or destroyed by fire or other casualty.
 17. **Dispute resolution** – A lease may also include a dispute resolution process that can range from a mutual commitment to engage in a facilitated conflict management process, to shared cost of formal mediation.

Microloans Available Now



The Farm Service Agency (FSA) developed the Microloan program to better serve the unique financial operating needs of beginning, niche and small family farm operations.

FSA offers applicants a Microloan designed to help farmers with credit needs of \$35,000 or less. The loan features a streamlined application process built to fit the needs of new and smaller producers. This loan program will also be useful to specialty crop producers and operators of community supported agriculture (CSA).

Eligible applicants can apply for a maximum amount of \$35,000 to pay for initial start-up expenses such as hoop houses to extend the growing season, essential tools, irrigation and annual expenses such as seed, fertilizer,

utilities, land rents, marketing, and distribution expenses. As financing needs increase, applicants can apply for a regular operating loan up to the maximum amount of \$300,000 or obtain financing from a commercial lender under FSA's Guaranteed Loan Program.

Individuals interested in applying for a microloan or would like to discuss other farm loan programs available, should contact the local FSA office to setup an appointment with a Loan Approval Official.

Questions? Contact your local FSA office. A list of county offices is available at <http://offices.sc.egov.usda.gov/locator/app?state=ny&agency=fsa> or call the State Office at 315-477-6300.

New Fact Sheet on Asian Pears

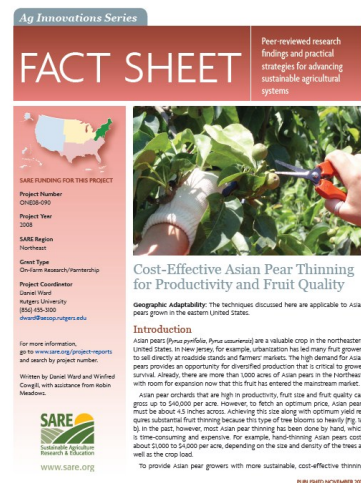
Asian pears (*Pyrus pyrifolia*, *Pyrus ussuriensis*) are a valuable crop in the northeastern United States. Asian pear orchards that are high in productivity, fruit size and fruit quality can gross up to \$40,000 per acre. However, to fetch an optimum price, Asian pears must be about 4.5 inches across. Achieving this size along with optimum yield requires substantial fruit thinning because this type of tree blooms so heavily. In the past, most Asian pear thinning has been done by hand, which is time-consuming and expensive.

To provide Asian pear growers with more sustainable, cost-effective thinning strategies, a SARE-funded team of researchers and farmers in New Jersey studied how effectively Asian pears were thinned by a synthetic plant growth regulator called benzyladenine. They found that MaxCel, one of several chemical thinners that contain benzyladenine, can reduce the cost of hand-thinning by up to 50 percent while delivering fruit yields and sizes comparable to those of untreated, hand-thinned control trees.

This fact sheet provides a brief introduction to plant growth regulators and directions on how to use MaxCel as a crop thinner for Asian pears.

This and many valuable fact sheets can be found on the SARE website at <http://www.sare.org/Learning-Center/Fact-Sheets/Cost-Effective-Asian-Pear-Thinning-for-Productivity-and-Fruit-Quality>.

Source: SARE website <http://www.sare.org>



Farm Business Management for Women in Agriculture

Six sessions - Thursdays 9:30 am - 2:00 pm, February 6 - March 13, 2014

Hosted at various Cornell Cooperative Extension offices throughout NY State

Annie's Project: A Risk Management Perspective. Workshop fosters problem solving, record keeping, and decision-making skills for farm women. Topics include farm business planning, marketing, financial statements, software training, agricultural production, employee relations and estate planning. Sessions include webinar followed by class discussion with local specialists.

Who Should Attend? Experienced farm and ranch women wanting a more active role in the business aspects of their farm operations will find this program motivating, enjoyable and practical.

The following CCE County Offices will host this workshop: Broome, Chautauqua, Cortland, Essex, Jefferson, Livingston, Oneida, Orange, Orleans, Saratoga, Schoharie/Otsego, St. Lawrence, Tompkins, Ulster and Wayne counties. Cost is \$60 per person, lunch and course materials included. Registration deadline Jan. 10. For more information and registration go to Annie's Project NY: <http://blogs.cornell.edu/anniesproject/>.

Contacts: Bonnie Collins 315-736-3394 x104, bsc33@cornell.edu or David Cox 518-234-4303, dgc23@cornell.edu.

To learn more about the National Annie's Project Initiative, visit <http://www.extension.iastate.edu/annie/>.



Free Irrigation Apps Now Available!

The University of Florida has recently released a series of free apps designed to improve irrigation efficiency. The crop-specific apps collect information from growers on root length and crop location and combine it with real-time information from weather providers to create irrigation schedules.

The apps can be accessed here: <http://smartirrigationapps.org/>

Smartphone Technology For Managing Urban And Agricultural Irrigation

The project focuses on the development of Smartphone apps for citrus, cotton, strawberry, and urban lawn to provide real-time and forecasting information that can then be used for more efficient irrigation and water conservation.

See How It Works

<p>Citrus App</p> <p>The citrus app will provide users with an irrigation schedule based on a water balance and real-time weather forecast data received by wireless water and soil sensors.</p>	<p>Urban Lawn App</p> <p>The urban lawn app will provide users with an irrigation schedule based on a water balance and real-time weather forecast data received by wireless water and soil sensors.</p>	<p>Strawberry App</p> <p>The strawberry app will provide users with an irrigation schedule based on a water balance and real-time weather forecast data received by wireless water and soil sensors.</p>	<p>Cotton App</p> <p>The innovative cotton needs and forecasting app will provide users with an irrigation schedule based on a water balance and real-time weather forecast data received by wireless water and soil sensors.</p>
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Meet the Eastern New York Commercial Horticulture Program Staff

Vegetable Educators:



Chuck Bornt
 Phone: 518-859-6213
 Email: cdb13@cornell.edu
 Weed & pest ID/monitoring, reduced tillage, tomatoes, peppers, eggplant, potatoes, sweet corn, GAPs

Cornell Cooperative Extension offers support to fruit and vegetable growers throughout Eastern New York. We have assembled a team with industry specific expertise in business practices for efficient production and sustainable growth.



Crystal Stewart
 Phone: 518-775-0018
 Email: cls263@cornell.edu
 Organic production, small farm production, beginning farmers, garlic and other alliums, cooperative marketing



Amy Ivy
 Phone: 518-570-5991
 Email: adi2@cornell.edu
 High tunnel production, insect pests, winter greens, biocontrols



Teresa Rusinek
 Phone: 845-691-7117
 Email: tr28@cornell.edu
 Pest ID/monitoring, cultural and chemical recommendations, biocontrols, greenhouse vegetables



Maire Ullrich
 Phone: 845-344-1234
 Email: mru2@cornell.edu
 Muck soils, onions and other alliums, ethnic vegetables, marketing

Fruit Educators:



Mike Fargione
 Phone: 845-399-2028
 Email: mjf22@cornell.edu
 Tree fruit, IPM, maturity evaluation, harvest management, mitigating climatic impacts and wildlife damage



Jim O'Connell
 Phone: 845-943-9814
 Email: jmo98@cornell.edu
 Small fruit, pest management, grapes, IPM, weed management



Laura McDermott
 Phone: 518-791-5038
 Email: lgm4@cornell.edu
 Small fruit, pest management, nutrition, GAPs, high tunnel production



Kevin Iungerman
 Phone: 518-744-0720
 Email: kai3@cornell.edu
 Site and variety selection, short season apples, northern wine grapes, production systems, disease control/IPM

The Cooperative Extension Association
of Rensselaer County
Agriculture and Life Sciences Building
61 State Street, Troy, NY 12180

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UPCOMING EVENTS

Dec/Jan/Feb Farm Food Safety Trainings with GAPs, 2-Day Workshops, multiple locations/sessions, 8:30am-3pm both days. Dec. 18-19, CCE Wayne Co., Newark; Jan. 6-7, CCE Ontario Co., Canandaigua; Feb. 27-28, location TBA, Bath, NY. Training for farmers who are being required by buyers to provide 3rd-party verification of their food safety practices and for farmers thinking about moving in this direction. Day 1: what GAPs is, how it works, what it means for your farm. Day 2 (*laptop required*): writing a food safety plan as required for audit certification. More info. at <http://www.gaps.cornell.edu/eventscalendar.html> or contact: Craig Kahlke cjk37@cornell.edu or 585-735-5448.

Dec/Jan/Feb Greenhouse and High Tunnel Pest Management Programs - Free 6-part Webinar Series. Various topics and dates, on reducing pesticide resistance in greenhouse production. *See page 5 for details.*

Dec. 13, Dec. 20, and Jan 3. Capturing Money Using Quickbooks, Hudson Falls and Voorheesville, NY. Hands-on workshop for farmers to learn how to use Quickbooks for recordkeeping. *See page 9 for details.*

Dec. 17-19, 2013 New England Vegetable & Fruit Conference, Manchester, NH. Over 25 educational sessions covering major vegetable, berry and tree fruit crops plus various special topics. A Farmer to Farmer meeting after each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues. Also an extensive Trade Show with over 100 exhibitors. More info./registration at <http://www.newenglandvfc.org> or call Mark Hutton at 207-933-2100.

Jan. 21-23, 2014 Empire State Producers Expo and Trade Show, Syracuse, NY. This show combines the major fruit, flower, vegetable, and direct marketing associations of NYS for a comprehensive trade show and educational conference for fruit and vegetable growers. Informative speakers, exhibitors with new products, and friends to socialize with. For more info/registration/lodging go to <http://nysvga.org/expo/information/> or call 315-986-9320.

Jan. 24-26, 2014 32nd Annual Organic Farming & Gardening Conference. Saratoga Hilton & City Center, Saratoga Springs, NY. This conference offers a line-up of workshops on a wide range of topics from dairy farming to urban gardening, from food policy to business planning plus a special children's conference, entertainment, and delicious meals made from food donated by NOFA-NY's farmers. Scholarships are available. For more information about the conference, or to register, go to the following website or call 585-271-1979 x509: http://www.nofany.org/events/winter-conference/annual-organic-farming-gardening-conference?utm_source=December+3+Update&utm_campaign=Enews+Marketing&utm_medium=email.

Feb. 6-Mar. 13, 2014 Annie's Project: Farm Business Management for Women in Agriculture, A Risk Management Perspective. Workshop series on problem solving, record keeping, and decision-making skills in farm women on topics including marketing, production, employee relations and more. *See page 18 for details.*

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any product is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension. *CCE provides equal program and employment opportunities.*