Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

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Vegetable News

Late Season Caterpillar Management in Brassica Crops

Ethan Grundberg, CCE ENCYHP

Late season cole crops, especially cabbage, are still at risk of damage from a sequence of four caterpillar pests. Diamondback moth (DBM) caterpillars have been active in the Hudson Valley for about a week now and can often be identified by their characteristic forked tail. The pupae are also fairly easy to identify given their lacy loose cocoons found on leaves and stems (see image)

Diamondback moth pupae with lacy, loose cocoon.

Though I haven't found any yet, imported cabbage worm (ICW) eggs should begin to hatch soon. Around the same time, some localized hot spots may experience pressure from cabbage loopers (CL) as well. Finally, a new addition to the well-known trifecta of cole crop lepidopteran pests is the cross-striped cabbage worm (CSCW). Previously only active further south, CSCW has emerged as a very late season pest capable of seriously damaging crops through early November. As seen in the included image, CSCW has a distinctive white and black stripe pattern on its back that makes it easy to distinguish from the other brassica worms.

Cross-striped cabbage worm

CSCW eggs are laid in clusters, unlike DBM, CL and ICW, which means multiple caterpillars are typically found on infested plants. Beet armyworms, salt marsh caterpillars (see image), and yellow-striped armyworms may also be present, but are less common brassicas pests in the region.

Proper identification of caterpillar species is not simply an academic exercise; DBM

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populations are largely resistant to pyrethroid chemistries (IRAC group 3A). Given this fact, it is critical that growers use best resistance management practices when managing DBM throughout the year. Christy Hoepting of the Cornell Vegetable Program and Dr. Brian Nault prepared several insecticide sequence options that follow sound resistance management principles in the chart below. As is demonstrated, the sequences are based on other IRAC groups that ARE effective on DBM, including the spinosyns (i.e. Radiant, IRAC group 5), avermectins (i.e. Proclaim, IRAC group 6), diamides (i.e. Coragen, IRAC group 28), and indoxacarb (i.e. Avaunt, IRAC group 22A). Since there are multiple DBM generations per year, care must be taken to not expose different generations to the same modes of action (or IRAC group numbers) over the course of the season.

Salt marsh caterpillars and characteristic damage

Organic growers face a much more difficult challenge: labeled Bt formulations (especially Bt *aizawai* products like Xentari and Agree) work only on recently hatched early instar DBM. PyGanic is an IRAC group 3A product, so most DBM populations are resistant to its mode of action. That really only leaves the spinosyn IRAC group 5 product, Entrust, to rotate with especially once caterpillars are larger. Though ineffective once eggs have been laid, early insect netting to exclude adult moths from laying eggs can help reduce the need for insecticide applications later in the season.

The chart below was prepared by Christy Hoepting and Brian Nault.

Typical season:

Month	At	July				August				September				October			
Week	Planting[3]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
DBM[5]		Generation 1				Generation 2					Generation 3						
Insecticide MOA[1]		MOA 1				MOA 2					MOA 3						
Insecticide Spray		Spray 1		Spray 2		Spray 3		Spray 4			Spray 5			Spray 6			
IRAC[2]	1B/ 28	11A		11A		5		5			6			6			
E.g. Insecticide (Trade Name)	Lorsban/ Coragen	Agree, Xentari, Dipel		Agree, Xentari, Dipel		Radiant		Radiant			Proclaim			Proclaim			
Other insect pests controlled[4]	CM	ICM, sm CL		ICM, sm CL		ICM, CL, thrips		ICM, CL, thrips			ICM, CL			ICM, CL			

Difficult Season:

DBM[5]		Generation 1				Generation 2				Generation 3		
Insecticide MOA[1]		MOA 1		MOA 2		MOA 3		MOA 4		MOA 5		MOA 6
Insecticide Spray		Spray 1	Spray 2	Spray 3	Spray 4	Spray 5	Spray 6	Spray 7	Spray 8	Spray 9	Spray 10	Spray 11
IRAC[2]	1B/ 28	11A	11A	5	5	6	6	28	28	22A	22A	3A
E.g. Insecticide (Trade Name)	Lorsban/ Coragen	Agree, Xentari Dipel	Agree, Xentari Dipel	Radiant	Radiant	Proclaim	Proclaim	Coragen Beseige (+3A), Exirel	Coragen, Beseige (+3A), Exirel	Avaunt	Avaunt	Warrior
Other insect pests controlled[4]	CM	ICM, sm CL	ICM, sm CL	ICM, CL, thrips	ICM, CL, thrips	ICM, CL	ICM, CL	ICM, CL, thrips, CM, FB	ICM, CL, thrips, CM, FB*	ICM, CL	ICM, CL	ICM, sm CL, thrips, FB

[1]**MOA**: Mode of Action. [2]**IRAC**; Insecticide Resistance Action Committee chemical class. [3]Insecticide applied at planting for cabbage maggot control. Since Coragen is systemic and also has activity against DBM, this application may also provide control of DBM. Lorsban has no activity on DBM. [4]**Other insects controlled: ICM:** imported cabbage worm; **(sm) CL:** (small) cabbage looper; **thrips:** onion thrips; **CM:** cabbage maggot; **FB:** flea beetle. [5]DBM lifecycle from adult to eggs to larvae to pupa to adult is 28 to 67 days (Phillips *et al.* 2014). *only Besige controls FB.

Harvesting Sweet and Irish Potatoes for Storage

Chuck Bornt, CCE ENYCHP

I know that over the last couple of weeks sweet potato harvest has begun, but I suspect the bulk of sweet and Irish potato harvest will be getting into full swing now. I thought for a change, instead of having separate articles, I would put the two very different potatoes side by side in table format so you can see the major differences between the two. Remember, sweet potatoes and Irish potatoes have almost nothing in common in regards to storing but some similarities in how they can be handled!

Sweet Potatoes	Irish Potatoes
Do not let the roots get exposed to cold temperatures (less than 50°F), especially soil temperatures. Sweet potato vines can be hit with a light frost, but when roots are exposed to prolonged colder temperatures, they can form an internal white ring of tissue which really decreases the quality of the root. The roots will not store as long or taste as good.	Irish potatoes should not be harvested if the pulp temperature of the tubers is less than 40 °F. Pulp temperatures below that can increase bruising and internal issues like black spot. I find using a soil thermometer or even a meat thermometer that goes low enough works well to determine pulp temperatures.
One of the biggest questions I get is how do you deal with the vines? There are several ways, but all of them involve some extra labor. I know some growers that send a crew in before harvesting and hand cut the outside rows of vines and roll them off into the roadway. Then as they harvest those rows, the vines from the next rows can be cut and rolled off where the previous row was. The more efficient way in my opinion is to try and cut or shred the vines with a flail mower – however, you need to be very careful of the roots that may be sticking up above the soil line. I've seen old forage choppers used very nicely for this task. Cutting vines ahead of time **does not** make skins "set" or more resistant to skinning or bruising!	One of the key components to ensuring the highest quality potatoes is proper vine killing. Minimally vine killing should occur 2-3 weeks before harvest to ensure the tubers set their skin, making the tubers more resistant to skinning and bruising. Vine killing can be done many different ways including flail mowing, flaming and chemical desiccants.
The one nice thing about sweet potatoes is that they are not affected by many of the same diseases that Irish potatoes are so fungicides are usually not needed.	Maintain fungicide applications as long as there is green tissue left exposed including those stumps of vines from flail mowing. These tissues are still susceptible to diseases such as Late Blight.
Make sure that tubers are not falling from heights greater than 6 inches (this includes digging and handling). This will also help reduce the potential for bruising and black spot (a result of bruising).	
You need to cure them after harvest for several reasons. First, curing allows any cuts, abrasions or bruises to heal which allows for better storability of roots. Second, curing is when the roots develop their flavors and starches are converted into sugars which give sweet potatoes their sweetness. Ideal curing conditions are a temperature of 85°F with 90% humidity for 5-7 days. At this time of year empty greenhouses can be an excellent place to cure sweet potatoes, but there are a couple of things that need to be done. First, floors of the greenhouse should be watered several times a day in order to keep the humidity levels at 90%. Second, make sure fans are set for 85°F and the heater is turned on and set to keep the greenhouse as close to 85°F night.	**Do not put harvested potatoes directly into a cold storage.** Potatoes should go in a dark area and allowed to cool down gradually and heal or cure up a bit. The best temperatures for this to happen is 60 -65 degrees F for about 5 – 20 days at a high humidity with good air circulation. Cooling them down rapidly could result in condensation developing and that is not what we want as that can increase rot organisms that might already be there. I know this might be contrary to what most of us think, but carrying a little bit of moist soil into the bins or whatever you are harvesting into is not a terrible thing – and I don't mean tons of soil, but enough that it provides some of the humidity needed to help properly cure your potatoes.

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Once your sweet potatoes are cured, store as close to 55 - 60°F as possible, but no lower, and maintain a high humidity. If done properly, sweet potatoes should easily store into February and even into April if conditions are right.	After this healing period they can be moved into storage and cooled slowly to 40 F maintaining a high relative humidity of about 90 – 95%. This should help reduce the shrinking that happens in storage.
Do not wash potatoes before putting them into storage, but rather wash what you need as you need them. **Do not put warm potatoes into wash water that is 10 degrees colder as this will increase bacterial breakdown.** For that matter, you should follow this rule for all produce that is washed!	
Don't dig and plan on storing tubers from wet areas of a field. If possible keep them separate and plan to market those immediately to reduce the chance of brining disease into the storage.	
Cull hard! Do not put any potatoes that do not look healthy into your storage, and when it doubt, don't put it in!	

Pre-Planting Garlic Considerations

Crystal Stewart, CCE ENYCHP

Step one: Gaze lovingly at your garlic

I think this is pretty self-explanatory.

Step two: mercilessly cull any cloves which are soft

Taking the time to go through seed garlic carefully and culling any cloves which are soft or excessively light will go a long way towards making a healthy, uniform stand possible. But don't stop there--rather than simply tossing soft garlic into the garbage, take the time to open up a bulb now and then and examine the symptoms. Botrytis enters the bulb through the neck, and rots the bulbs from the center outward. Fusarium may attack the basal plate or may cause lesions on the bulb itself. Fusarium is present on almost all garlic at low levels, but can be increased by poor growing conditions (excessive water, poor fertility or poor soil biology), poor post-harvest handling (bruising), and poor storage conditions (too warm and moist can increase disease dramatically). Surface molds like black mold (aspergillus) can be intimidating, but if the garlic underneath is firm, they are likely not to be an issue for the seed. Know what diseases you have, and how to minimize their growth in the coming year.

Step three: Create an ideal growing environment now for better garlic next year

Real talk: creating the right environment for garlic actually starts years in advance, with optimization of rotation to include a three year break from alliums, cover crops to either enhance soil nitrogen or reduce weed pressure, and addition of major soil amendments like lime (if necessary) in previous seasons. The following recommendations are the short-term steps you can take to care for your garlic.

How is the **drainage** in this field? Are you going to need to make raised beds? If planting on plastic, you might want to consider making raised beds well ahead of time in order to ensure that you can finish this task when soil moisture is optimal. Every year I watch growers struggle with bed formation as the fall gets wetter and wetter. Raised beds are a slightly riskier proposition for bare soil that will remain so or will be straw mulched, but it might end up being worth considering.

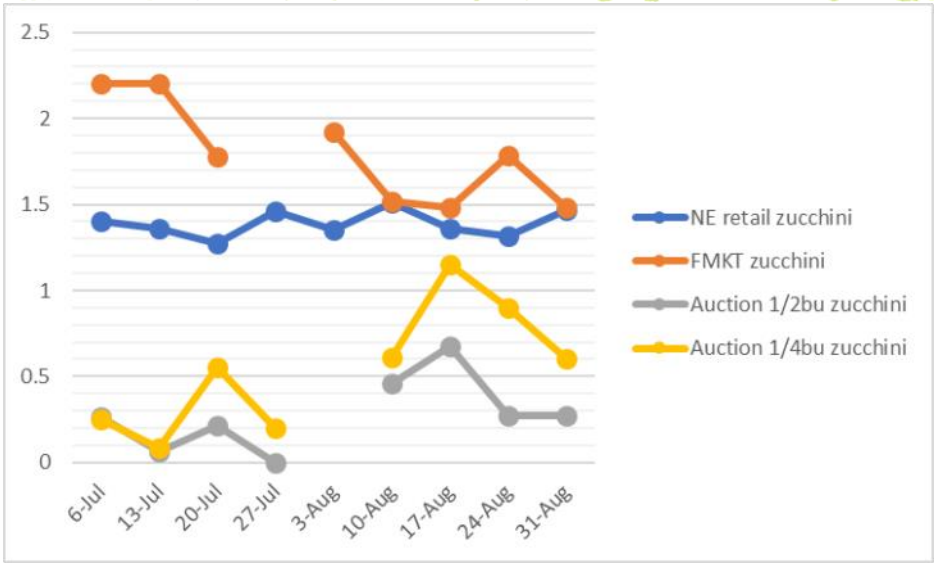
Consider the **weed complex** in the area you are planting into. Did you control perennial weeds (I'm looking at you, quackgrass)? Do you know what annual weeds are going to pose the biggest problem, and do you have a plan for control? Winter annuals plague some growers; for others crabgrass or lambsquarters are the main issue. Know when you will need to have strategies in place, and do anything you can at planting.

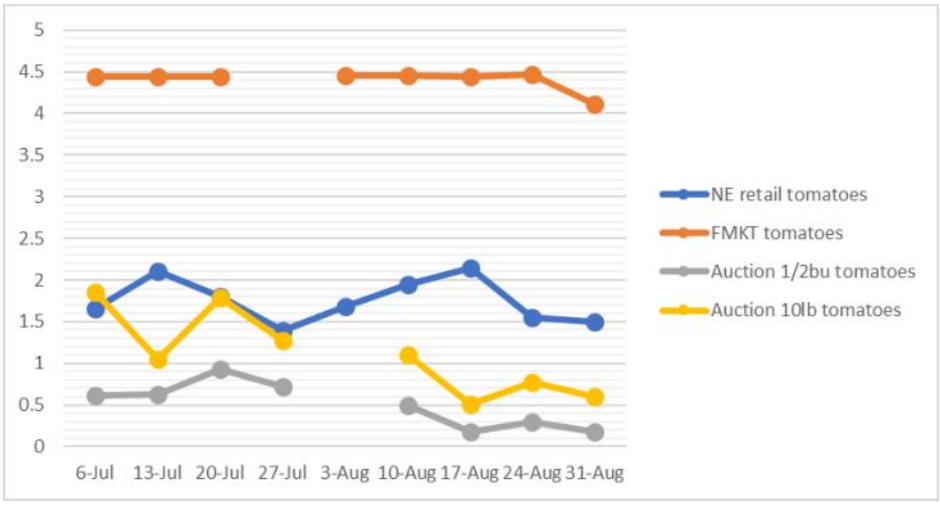
When creating a fertility plan the goal is to make sure adequate nutrients are available to the garlic when it needs them. Nitrogen is tricky in garlic because soil temperatures dramatically affect availability. Many growers are tempted to put much more than 100 lbs/A down to overcome the issue of cold spring soils. It's an understandable strategy, but chances are very good that much of this N is wasted. So far, we are maintaining the recommendation of 100 lbs of N, with slow release forms such as compost applied in the fall at planting, and quick release forms like Ammonium Nitrate or Chilean Nitrate (no more than 30% of total N is recommended in this form) applied as garlic emerges in the spring. **Our trials have not shown a yield boost with soluble forms above 50 lbs/A of spring applied soluble N**. If you apply only soluble forms, consider trying this lower rate. Phosphorus and potassium are still recommended applied in the fall at the rates recommended by the soil test.

Price Trends Retail, Farmer's Market and Auction 2018

Elizabeth Higgins, CCE ENYCHP

The following charts provide a snapshot of average retail prices of zucchini and tomatoes in northeast grocery stores (USDA-AMS), average price per pound at Vermont farmers markets (USDA-AMS) and estimated price per pound at a local wholesale produce auction by unit weight (CCE). Overall observations: package size seems to matter at the produce auctions. Smaller units consistently went for higher per pound prices for both zucchini and tomatoes. Retail and farmers market prices are (not surprisingly) steadier as the vendor sets the price whereas wholesale auction prices are much more dependent on the interest of buyers at a specific auction. However the retail data does not provide data on volume of sales on that date whereas the auction prices are the price of produce that was actually sold.





Zucchini - There seems to be a seasonality trend in farmers markets for zucchini, retail prices don't seem to change much over the season. Auction prices seem to be more influenced by demand by buyers. The best prices for zucchini were the opposite of at the farmers market.

Tomatoes – Farmers market vendors were able to hold tomato prices steady and high through the season, indicating that there is strong demand for tomatoes, even at consistently higher than retail prices. Wholesale, auction prices, on the other hand, were high early in the season, but declined as the season went on.

Corn Pest Trap Counts

County	CEW	ECB-Z	ECB-E	FAW	WBC
Albany	20	0	0	3	0
Clinton 1	55	0	0	8	na
Clinton 2	0	0	0	0	na
Rensselaer 1	8	0	0	0	1
Ulster 2	12	0	0	x	8
Ulster 4	15	0	0	x	2
Washington	35	0	0	1	0

Wireworm Bio-Control Update

Teresa Rusinek, CCE ENYCHP

Professor Elson Shields and Research Specialist Tony Testa of Cornell Dept. of Entomology, have been working with NY native entomopathogenic (insect attacking) nematodes (EPNs) for the past 20 years. Initially, the EPN bio-control systems were developed to protect alfalfa crops from the destructive snout beetle. This system has been highly successful, over 150 alfalfa fields in NY alone have been inoculated. EPNs have been proven to persist in the soil years after application. They require 2-4 years for full effectiveness determined by the application method.

Wireworm larva and damage to sweet potato.

Cornell Cooperative Extension, Eastern NY Commercial Horticulture Educators Teresa Rusinek and Charles Bornt have been working with Shields and Testa on a multi-year research project at the HV Farm Hub to test the efficacy of NY Native EPNs in the suppression of wireworms which are increasingly DAMAGING TO VARIOUS CROPS, especially roots crops, grown in the Hudson Valley. Our project began in May of 2017 at the Farm Hub, where we established research plots in a field where wireworms were found in large numbers. Four control plots had no EPNs applied, four plots were treated with both Steinernema carpocapsae (Sc) and Steinernema feltiae (Sf) nematodes, and the final four plots were treated with Sf and Heterohabditis bacteriophora (Hb) nematodes. Each EPN species occupies a different depth in the soil and has somewhat different modes of action. This research will determine which nematodes species are best adapted to establish in the field as well as which combination of nematodes is most effective at suppressing wireworms.

Results from our harvest evaluation from last year look very promising. 200 sweet potatoes were harvested from each plot on Sept. 26, 2017 and scored for wireworm damage. EPN treated plots overall had 36% less wireworm damage than the untreated control plots. In addition, soil core bioassays taken earlier this spring show that the EPNs, Sf in particular, have well established and overwintered in the treated plots. We have not yet harvested and evaluated the sweet potatoes from this growing season.

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Farm Financial Education for Women - Annie's Project

November 12 - January 14, 2019

This 4-part series offered by CCE Ulster County and the Eastern NY Commercial Hort Team is designed for women who are farm owners or farm managers, or who anticipate moving into a decision-making position on a farm.

Certificates will be awarded from Annie's Project to those who complete all sessions and who have applied to have the program qualify for FSA borrower training.

November 12th - Welcome, Risk Management, Building a Network

In this program we will cover goal setting and risk management for your farm business and how to identify partners in your community who can help you with your business. Meet representatives from agencies that work with and represent farmers.

November 19 - Financial Skills

Understanding Your Farm Financials, Crop Insurance, Business Planning, accessing loans and using credit wisely. Meet representatives from financial institutions

December 10 - Managing Your Land and Infrastructure

Leasing and Owning Land and Infrastructure, Assessment and Taxes, Insurance and Risk Management
Meet representatives from: USDA and Soil and Water, Tax Assessors and Code Enforcement and Insurance.

January 7th - Your Business, Your Family and Your Employees

Hiring Employees, Dealing with Conflict (family and business), Planning for Retirement/Transition
Meet representatives from FarmNet, Ag Mediation, DOL, NYCAMH, Cornell Ag Labor and Farmworker Programs.

To register, contact Carrie Anne Doyle at CCE Ulster County http://ulster.cce.cornell.edu/events/2018/11/12/annie-s-project-business-education-for-farm-women

ANNIE'S PROJECT
EMPOWERING WOMEN IN AGRICULTURE

MANAGE YOUR RISK

in an agritourism business

Series begins Friday, 9/28/18

10:00 a.m - 2:30 p.m.

Bringing visitors to your farm can create new income streams as trends indicate that nature and agricultural tourism is on the rise the Catskills region. Agritourism can also be a source of risk to the farm business. Five seminars will teach how to manage risk followed by a panel of successful agritourism operators. In-between each seminar, participants will build on their knowledge to develop their own risk management plan. The five areas of risk that will be presented are: legal, marketing, human resource, financial and weather/ production risks. This 5-county program will be offered simultaneously in Delaware (the host county), Otsego/Schoharie, Sullivan and Ulster via Zoom technology. The program is sponsored by the Northeast Extension Risk Management Education agency and the five Cornell Cooperative Extension Associations.

Schedule:

Friday 9/28	**Introduction to Risk Management; Financial Risk**
Friday 10/5	**Production/weather risk**
Friday 10/12	**Legal risk**
Friday 10/19	**Marketing risk**
Friday 10/26	**Human resources risk**
Friday 11/2	**Agritourism panel**

There is no fee to attend and participants may bring their own lunch. Snacks and beverages provided.

RSVP by September 21, 2018

For more information contact Mariane Kiraly, Senior Resource Educator, Cornell Cooperative Extension at 607-865-6531

NORTHEAST EXTENSION RISK MANAGEMENT EDUCATION

Cornell University Cooperative Extension of Delaware County

Upcoming Events

Rear Your Own Entomopathogenic Nematode Demonstration

In addition to researching the efficacy of EPNs for suppression of several soil dwelling agricultural pests, Shields and Testa have developed a low-cost "farmer friendly" biological control procedure that has been used for on farm rearing since 2007. They work with farmers and agribusiness consultants around the state and country, teaching and assisting with the techniques of nematode rearing and applications. Producers are now able to purchase ready to apply nematodes to their own fields. Producers also have the option to purchase starter cups and rear their own nematodes which they then apply to their own fields.

Professor Elson Shields preparing the nematode application.

The upcoming EPN workshop is an opportunity for interested growers to learn hands on how to successfully rear and/or apply nematodes to their farm fields. Growers will also learn about EPN biology and the various crop pests that EPNs can help manage.

Thursday, September 27, 2018
4:00 PM- 6:00 PM
Hudson Valley Farm Hub
1875 Hurley Mountain Road , Hurley, NY

With Speakers: Elson Shields and Tony Testa of Cornell University; Teresa Rusinek and Charles Bornt of the Eastern New York Commercial Horticulture Program
This event is rain or shine. You can register by clicking here

For more information, you can call Teresa Rusinek at 845 392-6776.

Cover Crops Field Meeting

October 11, 2018
4:00-5:30pm

Cornell Willsboro Research Farm
48 Sayward Lane
Willsboro, NY 12996

A field visit to see and compare a variety of fall cover crops, planted in two different soil types, two weeks apart. We'll discuss establishment, choices, management and timing of several cover crops. Cover crops include oats, crimson clover, millet, daikon radish, Summer Feast Mix, barley and Soil Builder Plus. Discussions will be led by Mike Davis, Cornell Willsboro Farm Manager, and Chuck Bornt and Amy Ivy ENY Commercial Vegetable Specialists.

This is a free meeting, but registration is requested: Click Here to Register

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8:30am– 4:00pm

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