Biopesticides. What are they? Why use them? How do they work?

*Darcy Telenko, CCE Cornell Vegetable Program*

**What are they?** Biopesticides are defined by the EPA to “... include naturally occurring substances that control pests (biochemical pesticides), microorganism that control pests (microbial pesticides), and pesticidal substances produced by plants containing added genetic material (plant-incorporated protectants) or PIPs.”

- **Biochemical Pesticides**: naturally occurring substances that control pests by non-toxic mechanisms
  - Plant extracts such as Neem oil, citrus oil, seaweed/kelp extracts, giant knotweed
  - Hydrogen peroxide
  - Salts of phosphorus acid
  - Insect sex pheromones

- **Microbial Pesticides**: consist of a microorganism (bacterium, fungus, virus or protozoan) as active ingredient
  - *Bacillus spp.* (Bt producing strains of B.thuringensis), *Pseudomonas spp.*
  - *Streptomyces spp.*, *Trichoderma spp.*
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The next issue of VegEdge will be published on May 4, 2016.

Cornell Focus Group Meeting with Field Crops or Vegetable Farmers

April 21, 2016 | 11:45 AM - 1:30 PM (starting promptly with lunch at noon)
USDA Big Flats Material Science Center, 3266 State Rt 352, Big Flats, NY 14814

Are you a field crops or vegetable producer who has recently experienced the impacts of extreme weather or other changes in climate on your farm? Would you like to participate in cutting-edge social science research to better understand farmer views and actions around these issues? Please join Cornell University researchers, in partnership with Penn State and the USDA NE Climate Hub, on Thursday, April 21, 2016 for a luncheon Focus Group Meeting at the Big Flats Plant Materials Center (before the USDA NRCS 2016 Cover Crop Plot Tour) to share your thoughts and experiences with other farmers and researchers. This focus group discussion will enable farmers to learn more about how their peers are responding to climate impacts, and will help universities and the USDA develop new information and tools to support farmers to adapt and thrive in a changing climate, and become more energy efficient. To register: http://goo.gl/forms/8iybQlLQeE

All responses are confidential - the information you provide will not be identifiable with your name or farm. Space is limited to 10 field crops or vegetable farmers. We will be holding additional focus group sessions later this spring and summer with dairy and tree fruit producers and farm consultants, so please stay tuned. For further information on this project, please contact Allison Chatrchyan at 607-254-8808, or amc256@cornell.edu.

Share your thoughts! Get a FREE lunch! Enter a raffle to win a Tractor Supply gift card! 🎁
Biopesticides. What are they? Why use them? How do they work?

- Coniothyrium minitans (Contans WG), and bacteriophages

**Plant-Incorporated Protectants** (PIPs): Pesticidal substances that plant produce from genetic material that has been added to the plant.
- BT gene from *Bacillus thuringensis*, BT Cotton/ BT Corn

**Why use them?** Biopesticides are generally less toxic than conventional pesticides, affect only the target pest and closely related organisms, effective in ‘relatively’ small quantities with little residual, and generally have a short or no REI or PHI.

**How do they work?**

**Antibiosis** – microbial pesticides, where growth of one organism is detrimental to another through the production of antibiotics and other growth inhibitors. Examples include *Bacillus* spp., *Pseudomonas* spp., *Trichoderma* spp., *Gliocladium* spp., *Streptomyces* spp.

**Parasitism/Predation** – the microorganisms feed on the pest or pathogen of interested. Examples include *Coniothyrium minitans* (Contans WG) a parasite of *Sclerotinia* spp., *Trichoderma* spp. parasite of numerous soilborne fungal pathogens, bacteriophages, viruses that infect and lyse bacteria, *Paecilomyces fumosoroseus* -parasitic to whiteflies, thrips, aphids and spidermites (greenhouse), and *Paecilomyces lilacinus* - parasitic to nematodes in field crops, vegetables, fruit and turf.

**Competition** with pests for nutrients, colonization sites on leaf or root tissues and possibly disguise roots from pest that rely on specific root signals to initiate germination or to guide movement/growth towards the host crop.

**Contact inhibition** by biochemical pesticides that inhibit germination or growth of pest, disrupt cells and can help dry out active lesions and prevent or slow secondary spread.

**Induced resistance** they turn on plant defenses to inhibit further infection by pathogens

**Will they work?** Effectiveness of the products vary and are dependent on:
- Target pathogen – may only work well against some pathogens, but not others and products are not curative!!!
- Environment - Efficacy is limited, especially under conditions that are highly conducive to sever disease
- Crop/Cultivar there is some evidence that this may have an effect on efficacy but this has not been looked at in detail.

Timing is extremely important. In general biopesticides are not curative, they need to be put out in preventative manner that integrates with other pest control strategies (cultural and chemical)

- May not be economical; depends on the specific operation

**A Few Examples:** Actinovate®AG, Agree®WG, PFR-97™, Sluggo®, Double Nickel®, Zonix®, Serenade®, Regalia®, Venerate®, RootShield®, T-22 HC to name just a sampling of a few examples that are available from a continually expanding market.

A number of these products have been evaluated by Dr. Chris Smart, Ms. Holly Lang, and Abby Seaman such as the downy mildew trial on cucurbits in 2015 (see table).

**Additional Cornell efficacy information can be found at the following sites:**
- Reports from NYS IPM trials: [http://nysipm.cornell.edu/vegetables/org_prod_efficacy.asp](http://nysipm.cornell.edu/vegetables/org_prod_efficacy.asp)
- In the Organic Guides: [http://nysipm.cornell.edu/organic_guide/](http://nysipm.cornell.edu/organic_guide/)
- IR-4 Biopesticide Project reports: [http://ir4app.rutgers.edu/biopestPub/grantFundedProj.aspx](http://ir4app.rutgers.edu/biopestPub/grantFundedProj.aspx)
- Plant Disease Management Reports: [https://www.plantmanagementnetwork.org/pub/trial/pdmr/](https://www.plantmanagementnetwork.org/pub/trial/pdmr/)
2015 Cover Crop Survey Results and Cover Crop Resources

Carol MacNeil, CCE Cornell Vegetable Program

Thirteen growers in the CVP area who participated in the Cornell Soil Health Assessment project replied to a survey on cover crop use in 2015. They reported planting a total of 6,519 acres of cover crops, beginning with frost-seedings, to summer plantings, through fall plantings. One grower had no cover crops but had hay crops. Another with no cover crops includes small grains in his rotation. A wide range of grasses, legumes, crucifers and other cover crops were planted. Cereal rye and red clover, alone or in a mix, were the most common cover crops. Other grasses included: annual ryegrass, oats, sorghum sudan, triticale, wheat and winter barley. Other legumes included: Austrian winter pea, Balsana clover, crimson clover, soybeans, sunnhemp, sweet clover and vetch. Crucifers included tillage radish and mustard. Buckwheat and sunflowers were also grown.

There were 733 acres of 2, 3, and even 9-way cover crop mixes planted on several farms. This is relatively new, but it has benefits. Some cover crops establish rapidly and prevent weed growth while a companion cover crop is taking time to get established (oats and a legume). Some cover crops over-winter so their nutrients aren’t released until cash crops need them (rye, wheat, winter barley, many legumes). Grasses soak up nitrogen from the soil, inducing legumes planted with them to produce even more nitrogen. Legumes produce the nitrogen that crucifer cover crops need to make maximum growth. Over-wintering grasses soak up the nitrogen that crucifers release when they die in mid-winter. When cover crop mixes are used it’s important to cut the seeding rate of grasses and tillage radish! Note: Most of these growers have legume and/or crucifer cash crops, so the acreage of legume and/or crucifer cash crops is less than it might be due to disease concerns.

Survey Responses Requested to Identify Water Use in New York

Darcy Telenko, CCE Cornell Vegetable Program and CICCA Climate Smart Farming Team

Please assist us in collecting information how you use irrigation on your farm. This information will help guide research in examining the relationship between precipitation, irrigation and crop yield. This data will further help identify ways to improve crop yields in New York when impacted by water.

Sherry Martin, a graduate student at SUNY-ESF, is conducting the study through project funded by the USDA titled “Evaluating the Influence of Climate Variability and Irrigation on Historical Crop Yield and Hydrologic Flow Regimes in Different Growing Regions in New York.

Your participation in this online survey is completely voluntary and should take approximately 10-15 minutes to answer questions. You may choose to exit the online questionnaire at any point. The responses from this survey will be used to provide insight into how farmers utilize irrigation, what crops are irrigated and the benefits and costs associated with irrigation. If you are willing to participate, please fill in the survey using the link provided to the right.

We appreciate your participation.

https://www.surveymonkey.com/r/KZDYHCL
Bacterial Blackleg – An Increasing Problem for Potato Growers
Carol MacNeil, CCE Cornell Vegetable Program

(Keith Perry, Plant Pathology, Cornell, and in charge of the Foundation seed potato program in NYS, spoke at the 2016 Empire State Producers Expo Potato Session on the increasing blackleg problem. This article is primarily taken from his presentation. To see his presentation, go to http://rvpadmin.cce.cornell.edu/uploads/doc_413.pdf)

Bacterial blackleg (BB), caused by *Pectobacterium* or *Dickeya* sp. (formerly called *Erwinia*) is not a new potato disease. It has caused occasional problems of seed decay, sprout decay, mid-season vine wilt and death, and tuber rot, for many years. A distinguishing characteristic of the disease is the inky-black color of the softening sprout or vine beginning below the soil line and spreading upward. No treatment can control the development of the disease in an infected potato plant, and there are no resistant varieties. The only control for this disease is planting blackleg-free, certified seed in a field that did not have the disease last year. (BB was observed to cause significant vine wilt and death at flowering in a field of certified Rebas from Maine in the CVP area last year. CRM, CVP)

According to Sandy Menasha, CCE Suffolk County, potato growers on Long Island observed increasing BB in 2014, and significant BB in 2015 causing up to 35% loss. Most of the Long Island fields affected were planted with certified Reba, Norwis or Superior seed, primarily from Maine. Maine, Wisconsin and other states’ potato production fields have also been affected. In the past *Pectobacterium atrosepticum* was the predominant cause of potato BB all over the world. *Dickeya dianthicola*, the cause of most of this new potato BB, has also been globally distributed for many years. *D. dianthicola* also infects many other crops, however. (This is not the new, aggressive *Dickeya solani*, limited to Europe since 2005.)

The National Potato Council held a conference call last fall with state potato specialists and seed certification personnel to discuss this national concern – the 2015 North American Outbreak of Potato Blackleg. A strategy for addressing this serious issue through seed certification is being developed. Unfortunately *D. dianthicola* can exist in potato tubers and plants without showing symptoms under cool conditions. This may have masked the presence of the disease in seed fields in 2013 and 2014 in some seed producing areas, allowing infected seed to slip through. Research is needed to determine how to more reliably detect *D. dianthicola* in potato seed lots. Revisions to seed certification protocols are expected.

**What should growers do?**
- Use only certified seed
- Ask your seed grower to supply the Field Inspection Report, or the North American Certified Seed Potato Health Certificate, for all seed lots (blackleg incidence is reported)
- Inspect seed carefully on delivery
- Clean seed cutting knives, handling equipment and the planter between seed lots (BB will spread within a seed lot during cutting)
- Practice crop rotation so potatoes don’t follow potatoes
- Plant seed warmed to 50°F into well drained soil that’s at least 50°F
- Avoid excess irrigation

If you wish to confirm the pathogen, Keith Perry has made arrangements to do testing in NY, through the Plant Diagnostic Clinic in Ithaca. If you think you may have blackleg contact Carol MacNeil at cm6@cornell.edu or 585-313-8796.

Cover Crop Survey Seeking Grower Input, and Recent Results
From the Conservation Technology Information Center, http://www.ctic.org

A survey on cover crop use is seeking input from growers around the country. The survey asks why farmers do or do not plant cover crops, what they expect to gain from the practice, and what their concerns are. Results from the survey help guide policy, research and education on cover crops. This quick survey will be at http://tinyurl.com/ccc surve y2016 until May 1, 2016. All responses are anonymous. Participants can enter a drawing for a $100 gift card. The cover crop survey is conducted by the Conservation Technology Information Center (CTIC), in conjunction with USDA’s Sustainable Agriculture Research and Education (SARE) program, and the American Seed Trade Association.

Results from recent surveys, and other information are available at: http://www.conservationinformation.org/Cover%20Crops/.
Seasonal Outlook from NOAA Climate Prediction Center

Darcy Telenko, CCE Cornell Vegetable Program

The Climate Prediction Center (CPC), under the National Oceanic and Atmospheric Administration (NOAA) gives a three-month outlook on the temperature and precipitation based on real-time data and information that predict and describe climate variations, thereby promoting effective management of climate risk. The products cover time scales from a week to seasons, and are available for use by the public or private sector where outlook forecasts are important, such as in agriculture.

To read the precipitation outlook map created March 17, 2016:
White – EC equal chances of above or below normal precipitation for the next three months
Green regions – A greater chance of above normal precipitation for the next three months
Orange regions – B greater change of below than normal precipitation for the next three months

The prediction for NY shows a three-month outlook of equal chance of above or below normal precipitation till June 17.

For more info and updated maps see: http://www.cpc.ncep.noaa.gov/products/predictions/long_range/seasonal.php?lead=1

To read the temperature outlook map created 3/17/16:
White – EC equal chances of above or below normal temperature for the next three months

Red regions – A greater chance of above normal temperature for the next three month.

Blue regions – B greater change of below than normal temperatures for the next three months.

The prediction for NY shows a three-month outlook of between a 50-60% chance of greater than normal temperatures till June 17.

Pesticide Options for Pests of Potato in New York

Brian Nault and Dan Olmstead, Department of Entomology, Cornell, NYSAES (prepared 3/24/16)

The many pesticide options available for managing potato pests will make your head spin! There are products that will control Colorado potato beetle, aphids, leafhoppers, flea beetles, cutworms, European corn borer, wireworms, symphylans, spider mites and slugs. Of course, there is no single product that will control all of these pests. Therefore, it is important to know what pests you anticipate needing to manage before planting as well as those that infest your fields during the season. To assist you in determining what product or products might best manage the complex of pests in your potato fields, a list of over three dozen products labeled on potato in New York have been summarized in the accompanying chart (also available on the CVP website Potato page at: http://rvpadmin.cce.cornell.edu/uploads/doc_422.pdf). If you would like an enlarged copy of the chart, please contact Angela Parr at aep63@cornell.edu or 585-394-3977 x426.

Information in this chart is organized into two major groups: pesticides registered in NYS for use at planting and those as foliar treatments. Within each of these sections, the pesticide active ingredient is listed, followed by the trade name(s), rates, Insecticide Resistance Action Committee (IRAC) mode of action group number, the type of application, whether it can be used on Long Island, if it is safe for bees, and whether it is OMRI approved. This information is followed by the pests listed on the product label. If there’s a “Y” in the white boxes it signifies “YES” that the product may be applied in a certain manner in New York State, it can be used on Long Island, it is toxic to bees, it is OMRI approved, and it is labeled for a certain pest.

This chart does not provide information on which products are most effective for managing certain pests or pest complexes (or whether a product is most effective on small CPB larvae). Additionally, this chart does not provide information on which products may no longer be effective due to insecticide resistance. For example, there are neonicotinoid and pyrethroid insecticides labeled for Colorado potato beetle control, but these classes of insecticides may not work on certain farms due to insecticide resistance. There are other resources available to help you determine which insecticides should be used and the manner in which to use them to avoid insecticide resistance.

Go to: http://nault. entomology. cornell. edu/extension/ colorado-potato-beetle-in-potatoes/ - click on [PDF], and refer to the 2016 Cornell Integrated Crop and Pest Management Guidelines for Commercial Vegetable Production. To order a copy, go to: http://store.cornell.edu/c-875-pmep-guidelines.aspx

continued on next page
## Pesticides available in New York for managing pests of potato

Y - denotes "YES"; application use is labeled in New York State, Long Island, toxic to bees, OMRI approved and the pest is listed on the product label.

### AT PLANTING

<table>
<thead>
<tr>
<th>Insecticide component</th>
<th>Trade name</th>
<th>Rate</th>
<th>IRAC class</th>
<th>APPLICATION</th>
<th>Soil</th>
<th>Long Island use</th>
<th>OMRI Approved</th>
<th>CPB</th>
<th>Pests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abamectin</td>
<td>Abba 0.15 EC</td>
<td>8.0 - 16.0 fl oz/acre</td>
<td>6</td>
<td>Y</td>
<td>Y</td>
<td>12 - 24</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Acetamiprid</td>
<td>Assail 35G</td>
<td>1.5 - 2.5 fl oz/acre</td>
<td>4a</td>
<td>Y</td>
<td>Y</td>
<td>12 - 17</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Azadirachtin</td>
<td>Neemix 4.5</td>
<td>2.0 - 16.0 fl oz/acre</td>
<td>UN</td>
<td>Y</td>
<td>Y</td>
<td>4 - 0</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Sniper</td>
<td>8.6 - 19.2 fl oz/acre</td>
<td>3a</td>
<td>Y</td>
<td>Y</td>
<td>12</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Carbaryl</td>
<td>Sevin XLR Plus</td>
<td>1.0 - 3.5 pt/acre</td>
<td>3a,UN</td>
<td>Y</td>
<td>Y</td>
<td>12 - 0</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Chlorantraniliprole</td>
<td>Caragen</td>
<td>1.5 - 5.0 fl oz/acre</td>
<td>28</td>
<td>Y</td>
<td>Y</td>
<td>12 - 17</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Crystaline</td>
<td>Prokil Crystalite 96</td>
<td>10.0 - 12.0 lb/acre</td>
<td>UN</td>
<td>Y</td>
<td>Y</td>
<td>12</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Cyromazine</td>
<td>Triggard</td>
<td>2.7 - 5.3 fl oz/acre</td>
<td>17</td>
<td>Y</td>
<td>Y</td>
<td>12 - 17</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Dimethoate</td>
<td>Dimethoate 400 or OLP</td>
<td>1.0 pt/acre</td>
<td>1b</td>
<td>Y</td>
<td>Y</td>
<td>48</td>
<td>0</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Flomamide</td>
<td>Beleaf 50SG</td>
<td>2.0 - 2.8 fl oz/acre</td>
<td>9c</td>
<td>Y</td>
<td>Y</td>
<td>12</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Imidacloprid</td>
<td>Provado 1.6%, Nuprid 1.6%</td>
<td>0.75 fl oz/acre</td>
<td>4a</td>
<td>Y</td>
<td>Y</td>
<td>12 - 7</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Montana 2F</td>
<td>3.0 fl oz/acre</td>
<td>4a</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>12 - 7</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Nivaluron</td>
<td>Rimin 0.83EC</td>
<td>6.0 - 12.0 fl oz/acre</td>
<td>15</td>
<td>Y</td>
<td>Y</td>
<td>12 - 14</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Permethrin</td>
<td>Ambush 25W</td>
<td>3.2 - 12.8 fl oz/acre</td>
<td>3a</td>
<td>Y</td>
<td>Y</td>
<td>12 - 14</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Ponce 25 WP</td>
<td>6.4 - 12.8 fl oz/acre</td>
<td>3a</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>12 - 14</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Pymetrozine</td>
<td>Fulfill</td>
<td>2.0 - 4.0 lb/acre</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>24</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Spirotetramat</td>
<td>Movento</td>
<td>4.0 - 5.0 fl oz/acre</td>
<td>23</td>
<td>Y</td>
<td>Y</td>
<td>24 - 7</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Thiamethoxam</td>
<td>Actara</td>
<td>1.5 - 3.0 oz/acre</td>
<td>4a</td>
<td>Y</td>
<td>Y</td>
<td>12 - 14</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Sulfur</td>
<td>Microthol Disperser</td>
<td>5.0 lb/acre</td>
<td>-</td>
<td>Y</td>
<td>Y</td>
<td>24</td>
<td>0</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>Thiamethoxam + lambda-</td>
<td>Endigo ZC</td>
<td>3.5 - 4.5 fl oz/acre</td>
<td>3a,4a</td>
<td>Y</td>
<td>Y</td>
<td>24</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Chlorinated hydrocarbon</td>
<td>Eutect 125</td>
<td>3.0 fl oz/acre</td>
<td>3a</td>
<td>Y</td>
<td>Y</td>
<td>12 - 14</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Zeta-cypermethrin + abamectin</td>
<td>Gladiator insecticide</td>
<td>8.0 - 19.0 fl oz/acre</td>
<td>3a,6</td>
<td>Y</td>
<td>Y</td>
<td>12 - 14</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
Precision Agriculture Day - 1st Annual
April 4, 2016 | 8:30 AM - 2:30 PM
Genesee Community College, The BEST Center, 1 College Rd, Batavia, NY 14020

Have you mastered Precision Agriculture technology and want to take it to the next level? Are you mystified by this advanced technology but are ready to start learning? Join an international consultant and local experts from WNY as we discuss Precision Ag technology and how it impacts you! Featuring keynote speaker Marc Vanacht, Principal, AG Business Consultants, St. Louis, MO with a session titled, “After 20 Years, is Precision Agriculture Finally Coming Together?” There will also be a special session, “Using Aerial Drones to Enhance Field Production” by Brian Pitre, CEO, SkyOp, LLC.

Cost: $65 per participant, includes lunch. For more information, including the full agenda and information on the speakers at this event, visit http://www.genesee.edu/best/development/career-and-personal-enrichment-courses/precision-agriculture-day/ or contact Reid Smalley in GCC’s BEST Center at rjsmalley@genesee.edu or 585-343-0055 x6527.

Worker Protection Standard Training & DEC Special Permit Training
April 5, 2016 | 8:30 AM - 12:00 PM English session; 12:30 PM - 4:30 PM Spanish session
CCE Wayne County, 1581 St Rte 88 (intersection of Hydesville Rd), Newark, NY 14513

Special Permit training program has been revised to address issues raised by the DEC. Note: special permits (SP) will only be issued for 11 specific pesticide labels and SP trainees will have to pass a test. This will relieve the certified pesticide applicator from “on-site within voice contact” supervision of non-certified pesticide applicators when they are handling federally-restricted-use pesticides for which they hold a Special Permit. The labels that will be covered by this Special Permit include Lorsban Advanced, Endigo ZC, Warrior II with Zeon Technology, Agri-Mek SC, Vollam Xpress, Gramoxone SL 2.0, Leverage 360, Danitol 2.4EC, Mustang Maxx, Asana XL, and Lannate LV.

Certified Supervisors are required to attend the first 30 minutes of the training. Workers in need of special permits vs general pesticide training will need to be identified. Workers requiring general pesticide training who do not need special permits will not be tested, but will still receive a course participation certificate and Agricultural Worker Protection Standard Handler card.

Pre-registration is required ASAP. To register, contact Kim Hazel at 585-798-4265 x26 or krh5@cornell.edu.

Field and Produce Pest Meeting
April 6, 2016 | 1:00 PM - 3:30 PM
Andy D. Miller farm shop, 12106 Leon New Albion Rd, Conewango Valley, NY 14726

This course will educate growers on weed, disease and pest management in field crops and vegetables. Disease resistant varieties, pests and diseases, cultural management and appropriate herbicide options will be presented by Judson Reid, Darcy Telenko, and Cordelia Hall of the Cornell Vegetable Program.

FREE! DEC recertification credits will be available. Contact Judson Reid at 585-313-8912 for more information.

Understanding and Managing Soils for Top Vegetable Production
April 15, 2016 | 1:00 PM - 3:00 PM
Roy and Sylvia Stutzman Farm, 10501 Rogers Rd, Fillmore, NY 14735

This workshop will cover the biology, physical condition, and chemistry of a healthy, productive soil. The Cornell Soil Health Test will be described, and examples of test results for area farms will be shown. Ways to improve the health and productivity of your soil will be discussed. How to sample soil for accurate nutrient analysis will be demonstrated. The Cornell pH Test Kit (do-it-yourself) will be shown, and participants will have the opportunity to test their own soils. Be sure to bring a soil sample! Part of this workshop will be in the field or high tunnel.

Preregister or walk-in. Preregistration is helpful for determining the number of handouts needed, as well as the number of chairs. Contact Lynn Bliven, CCE Allegany County, lao3@cornell.edu or 585-268-7644 x18.

Cover Crop Plots Tour (fall seedings)
April 21, 2016 | 1:30 PM
USDA NRCS Plant Materials Center, 3266 State Rte 352, Big Flats, NY 14814 (off I-86, x48)

There will be a brief introduction, then open discussion and a self-guided tour of the plots. Maps of the plots will be provided. The main studies include 25 cover crop species/mixes, plus seeding rate and date comparisons, ‘Aroostook’ and ‘Hazlet’ cereal rye seeded at 4 dates and 6 rates, and National Cover Crop Adaptation Trial, comparing varieties. Email with # attending to: shawnna.clark@ny.usda.gov

Questions? Or for special accommodations, contact: 607-562-8404, shawnna.clark@ny.usda.gov or paul.salon@ny.usda.gov
Grants for Dry Bean Research Awarded
Julie Kikkert, CCE Cornell Vegetable Program

The New York Dry Bean Association awarded a total of $33,857 for 6 research projects. The funds for these grants come from the Dry Bean Endowment. The following projects were awarded for 2016:

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Title</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ballerstein</td>
<td>Comparison of New and Standard Dry Bean Varieties at the NYAES Farm</td>
<td>$4,000</td>
</tr>
<tr>
<td>Griffiths</td>
<td>Breeding, Evaluation and Development of Dry Bean Varieties that are Highly Adapted to NYS Growing Environments and Markets</td>
<td>$12,857</td>
</tr>
<tr>
<td>Hamlin</td>
<td>Cool School Food: Encouraging the Use of Dry Beans in School Lunches, and Promoting the Health Aspects of Dry Bean Consumption</td>
<td>$2,000</td>
</tr>
<tr>
<td>MacNeil</td>
<td>The Magnitude and Distribution of Western Bean Cutworm and the Risk to Dry Bean 2016</td>
<td>$3,000</td>
</tr>
<tr>
<td>Pethybridge</td>
<td>Towards a Durable Management Strategy for White Mold in Dry Beans in New York</td>
<td>$9,000</td>
</tr>
<tr>
<td>Telenko</td>
<td>Weed Management Research in Dry Bean</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

**TOTAL AWARDS** $33,857

Grants for Processing Crops Research Awarded
Julie Kikkert, CCE Cornell Vegetable Program

The New York Vegetable Research Association and Council awarded a total of $132,918 for 9 research projects. The funds for these grants are contributed by the growers and processors through the processing contracts. The following projects were awarded for 2016:

<table>
<thead>
<tr>
<th>Researchers</th>
<th>Title</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telenko</td>
<td>Weed Management Research for Sweet Corn, Peas, Snap and Lima Beans, Beets, and Carrots</td>
<td>$42,000</td>
</tr>
<tr>
<td>Nault</td>
<td>Evaluating Novel Approaches for European Corn Borer and Corn Earworm Management in Sweet Corn and Snap Bean</td>
<td>$10,500</td>
</tr>
<tr>
<td>Pethybridge</td>
<td>Efficacy of Fungicides for the Management of Foliar Diseases of Table Beets in New York</td>
<td>$5,000</td>
</tr>
<tr>
<td>Pethybridge</td>
<td>Epidemiology and Management of Diseases Affecting Lima Beans in New York</td>
<td>$11,000</td>
</tr>
<tr>
<td>Pethybridge</td>
<td>Efficacy of Fungicides for the Management of White Mold in Snap Beans in New York</td>
<td>$26,956</td>
</tr>
<tr>
<td>Reiners, Ballerstein</td>
<td>Processing Pea Variety Trials</td>
<td>$7,696</td>
</tr>
<tr>
<td>Reiners, Ballerstein</td>
<td>Processing Snap Bean Variety Trials</td>
<td>$14,424</td>
</tr>
<tr>
<td>Reiners, Ballerstein</td>
<td>Processing Sweet Corn Variety Trials</td>
<td>$12,842</td>
</tr>
<tr>
<td>Reiners, Ballerstein</td>
<td>Processing Lima Bean Trials</td>
<td>$2,500</td>
</tr>
</tbody>
</table>

**TOTAL AWARDS** $132,918
VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program in Western New York. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

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**Julie Kikkert** | 585-313-8160 cell | 585-394-3977 x404 office | jrk2@cornell.edu  
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