

NY crop scouts are keeping an eye out for tar spot, a fungal disease of corn often found in

Latin America, confirmed in the U.S. for the first time.

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The number of herbicide resistant weeds continues to grow. What can you do to reduce your risk of herbicide resistance?



Winter greens growers should start scouting for pests soon. Learn what to

look for and what pests are most common in each crop.

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Weed competition in garlic causes yield reductions of 30% or more. Chateau herbicide, applied

in the Fall, packs the most punch for weed control in garlic.

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YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE O Issue 23 Volume 11 October 1, Cornell University **Cooperative Extension** Cornell Vegetable Program

## Tar Spot of Corn Reported for the First Time in the U.S.

Julie Kikkert, CCE Cornell Vegetable Program

A fungal disease of corn that commonly occurs in the cool, humid areas at high elevations in Latin America was reported for the first time in the United States in mid-September (Purdue Pest & Crop Newsletter, Issue 24, Sept. 11, 2015). Tar spot can be caused by two fungi, Phyllachora maydis and Monographella maydis. Fortunately, only *P. maydis* has been found in the U.S., as it is the less damaging species. The fungus is thought to have arrived by way of a tropical storm and has been officially confirmed in Indiana and Illinois.

Crop scouts in New York and elsewhere are keeping an eye out for this disease. Look for small yellow to brown lesions with raised round black structures on leaves and husks. The fungal fruiting bodies protrude from the plant tissue and look like a spot of tar. The spots give the leaf a bumpy or rough texture. They can occur as small flecks or



Tar spot on corn leaf. Photo courtesy of Purdue University Plant & Pest Diagnostic Laboratory.



VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a **Cornell Cooperative Extension** regional agriculture team, serving 11 counties in Western New York.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at: CCE Cornell Vegetable Program 480 North Main Street, Canandaigua, NY 14224 Email: cce-cvp@cornell.edu

Web address: cvp.cce.cornell.edu

#### Editor

Carol MacNeil **Contributing Writers** Robert Hadad Christy Hoepting Julie Kikkert Carol MacNeil Judson Reid Darcy E. P. Telenko Elizabeth Buck

Publishing Specialist/Distribution/Sponsors Angela Parr

VegEdge is published 25 times per year, parallel to the production schedule of Western New York growers. Enrollees in the Cornell Vegetable Program receive a complimentary electronic subscription to the newsletter. Print copies are available for an additional fee. You must be enrolled in the Cornell Vegetable Program to subscribe to the newsletter. For information about enrolling in our program, visit cvp.cce.cornell.edu. Cornell Cooperative Extension staff, Cornell faculty, and other states' Extension personnel may request to receive a complimentary electronic subscription to VegEdge by emailing Angela Parr at aep63@cornell.edu. Total readership varies but averages 750 readers.

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Main Street, Canandaigua, NY 14424.

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The next issue of VegEdge will be published on November 1, 2015.

## <<< BREAKING NEWS >>>

## Ag Worker Protection Standard Revisions Finalized

On September 28, 2015 EPA finalized revisions to the worker protection standard. This final rule enhances the protections provided to agricultural workers, pesticide handlers, and other persons under the Worker Protection Standard (WPS) by strengthening elements of the existing regulation, such as training, notification, pesticide safety and hazard communication information, use of personal protective equipment, and the providing of supplies for routine washing and emergency decontamination. For more information, visit the EPA website at http://www2.epa.gov/pesticide-worker-safety/agricultural -worker-protection-standard-revisions

In addition, a document comparing new protections to existing protections is available at <a href="http://www2.epa.gov/sites/production/files/2015-09/">http://www2.epa.gov/sites/production/files/2015-09/</a> documents/comparison-chart-wps.pdf

Per Nancy Fitz, US EPA – Office of Pesticide Programs, compliance with most of the new standards will be required in mid-December 2016.

Info provided by Jack Rabin, Rutgers Cooperative Extension, Plant & Pest Advisory, 9/29/15 0

coalesce into large areas of blighted tissue. Tar spot can be confused with the overwintering phase of corn rust. There are also many saprophytic fungi that feed on dead corn tissue and form black splotches on the leaves. We still have some processing sweet corn (and field corn) in the field. If you see anything suspicious, please contact me at <u>jrk2@cornell.edu</u> and I will arrange for samples to be sent in to Cornell University for free testing.

For more information, USDA-ARS Diagnostic Fact Sheet: <u>http://nt.ars-grin.gov/taxadescriptions/factsheets/index.cfm?</u> <u>thisapp=Phyllachoramaydis</u>

## Food Safety News Update

Robert Hadad, CCE Cornell Vegetable Program

The Fall is here and the long anticipated FDA Food Safety Modernization Act rules have started to tumble forth. The first to come out is FDA Holding Public Meeting on FSMA Preventive Controls for Human and Animal Food Final Rules. This has implications for operations (including farms) that do processing of produce on the premises.

#### FDA will be holding Public Meeting on FSMA Preventive Controls for Human and Animal Food Final Rules

The U.S. Food and Drug Administration announced today a public meeting to offer the opportunity for discussion on the recently finalized rules on preventive controls for human and animal foods under the FDA Food Safety Modernization Act (FSMA). For registration and additional information, visit FSMA Preventive Controls Public Meeting. The meeting will be in Chicago but a live Webcast will be available. For more information, go to: <u>http://</u> www.fda.gov/Food/ GuidanceRegulation/FSMA/ ucm461791.htm? source=govdelivery&utm medium=em ail&utm source=govdelivery

The FSMA rules for fruit and vegetable

farms that covers reducing microbial risk during production, washing, and packing are due at the end of the month. The rule will require compliance first from the larger farms making over \$500,000 in sales. The FDA has asked that trainings for the rule not start until January 2016. We will probably begin trainings later in the winter here in NY. The national curriculum for the training might have to be modified to reflect any changes in the final rule.

In some areas of the country, including New England, FDA inspectors have already started showing up unannounced to produce farms. They seemed especially interested in washing and packing facilities and practices. In several cases, they collected vegetables for microbial testing.

Media coverage on food safety issues hasn't received a lot of publicity over the summer. Recently, however, executives from a peanut company were sentenced to 20-28years in prison after being found guilty of food adulteration due to the Salmonella outbreak. Nine people had died and hundreds were sickened. This was splashed all over the news. More media scrutiny has occurred from another Salmonella case where cucumbers imported from Mexico were responsible for sickening over 500 people with three deaths in 33 states over the summer. This outbreak continued for over a month because the cucumbers coming out of the production area were being contaminated repeatedly from each harvest. Eleven lawsuits have been filed against the US company connected with the Mexican farm and it is expected that several of the stores and restaurants that sold/ served the cucumbers might also be sued.

The Cornell National GAPs Program, the Produce Safety Alliance, and the Cornell Vegetable Team and Lake Ontario Fruit Team will be hosting a food safety session at the 2016 Empire State Producers Expo. This conference will be held January 19-21 in Syracuse at the Oncenter. The Food Safety session will be Wednesday, January 20 at 3:30. The focus of the presentations will be updates on the FSMA rule, training information, and a discussion on what to do if an FDA inspector shows up on your farm.

## **Update on Herbicide Resistant Weeds**

Darcy Telenko, CCE Cornell Vegetable Program

The number of herbicide resistant weeds continues to grow. As of September 25, there were 153 unique herbicide resistant weeds reported in the Unites States, which means an additional seven have been added to the list since January. Weeds with resistance to multiple sites of action also continues to increase worldwide with a new total of 82 species.

#### Why should we care about herbicide resistance?

- 1. Resistant weed populations will require changes in current weed and crop management programs.
- 2. They will increase the cost of weed management.
- 3. Reduce viability of herbicide options.
- 4. And in the long run could impact yield potential and income.

continued on page 4

#### continued from page 3 – Update on Herbicide Resistant Weeds

| A number of factors that have led<br>to the increased emphasis on im-<br>plementing herbicides programs to<br>mitigate or at least slow the devel-<br>opment of herbicide resistant<br>weeds. They include: no herbicides<br>with new mechanisms of action are<br>in advanced development trials<br>(the last mechanism of action was<br>introduced 20 years ago!); acreage<br>with resistant weeds is increasing<br>in the United States and glyphosate<br>(Roundup) resistance continues to<br>develop; and herbicide resistant<br>weeds will change herbicide use,<br>although resistance has not yet led<br>to total loss of any one herbicide. | Top Fifteen Herbicides with Resistant Weeds |                | Top Fifteen Resistant Weed Species |                           |
|---|---|----------------|------------------------------------|---------------------------|
|   | Herbicide common name<br>(Trade name)       | # weed species | Weed Species                       | # mechanisms<br>of action |
|   | atrazine (AAtrex)                           | 66             | Ryegrass                           | 11                        |
|   | imazethaphyr (Pursuit)                      | 44             | Common barnyard grass              | 10                        |
|   | tribenuron-methyl (Express)                 | 43             | Annual bluegrass                   | 9                         |
|   | imazamox (Raptor)                           | 37             | Slender foxtail                    | 7                         |
|   | hlorosulfuron (Glean)                       | 36             | Junglerice                         | 7                         |
|   | metsulfuron (Ally)                          | 34             | Goosegrass                         | 7                         |
|   | iodosulfuron-methyl-sodium (Hussar)         | 33             | Palmer amaranth                    | 6                         |
|   | glyphosate (Round-up)                       | 32             | Tall waterhemp                     | 6                         |
|   | fenoxaprop-P-ethyl (Puma)                   | 31             | Perennial ryegrass                 | 6                         |
|   | simazine (Princep)                          | 31             | Smooth pigweed                     | 5                         |
|   | paraquat (Gramoxone)                        | 30             | Common ragweed                     | 5                         |
|   | bensulfuron (Londax)                        | 28             | Wild oat                           | 5                         |
|   | thifensulfuron (Harmony)                    | 27             | Canadian horseweed                 | 5                         |
|   | fluazifop-P (Fusilade DX)                   | 25             | Kochia                             | 5                         |
|   | pyrazosulfuron-ethyl                        | 24             | Wild radish                        | 5                         |
|   |   |                |                                    |                           |

What can we do to reduce our risk of herbicide resistance? Best Management Practices (BMP's) for effective weed control must utilize an integrated program including cultural, mechanical and herbicidal options which include:

- 1. Understanding weed biology.
- 2. Preventing weed seed production and reducing the number weed seeds in the soil seedbank.
- 3. Plant into weed-free fields and keep them as weed free as possible.
- 4. Plant weed-free crop seed.
- 5. Scout field regularly.
- 6. Use multiple herbicide mechanisms of actions (MOAs).
- 7. Apply labelled rate of herbicide for weed size.
- 8. Implement cultural practices that increase crop competitiveness.
- 9. Use mechanical and biological options when available.
- 10. Prevent field-to-field and within field movement of weed seed or propagules.
- 11. Manage weed seed at harvest and after harvest to prevent buildup in soil seedbank.
- 12. Manage field borders to reduce influx of weeds.

So you've implemented a weed management program in a field and weeds are present after application. What's next? You need to determine the reason why the weeds are still present. Some general factors that may affect performance of a herbicide should be investigated and ruled out before suspecting herbicide resistance. These factors include field history, weed biology, environmental conditions, crop and cultural practices and finally herbicide resistance. There are a number of general patterns that may occur in a field in the absence or presence of herbicide resistance.

#### Absence of herbicide resistance

- > Multiple weed species are present
- > A uniform response of individual within a population
- > The spatial pattern of plants remaining in the field can be correlated with herbicide application

#### Presence of Herbicide Resistance

- > A single weed species is present, especially late in the season. All other weed species on the label are controlled
- > The response of an individual surviving weed can range from little or no injury to death
- > The spatial patter of surviving weeds is random or consists of multiple plants within a patch



Multiple weed species in sweet corn in an area where herbicide application was missed. *Photo: Darcy Telenko, CVP* 



A single weed species (pigweed) at the end of the season in random patches in a field. *Photo: Darcy Telenko, CVP* 

For more information there will be a weed management session at the Empire State Producers' Expo **Weed Management:** From Organic to Conventional the Latest in Weed Management Strategies in Syracuse on January 19 3:30 pm.

If you suspect you may have resistance in your field please contact your local extension office or myself at dep10@cornell.edu

Info adopted from: Norsworthy et al.: Best practices for reducing herbicide resistance. Weed Science 2012 Special Issue: 31-62, and WSSA Herbicide Resistance Lessons 2011. Heap, I. 2015. The International Survey of Herbicide Resistant Weeds. Online. <u>www.weedscience.org</u>

## Soil Sample and Test Your Fields This Fall

Carol MacNeil, CCE Cornell Vegetable Program (information from the 2015 Cornell Vegetable Guidelines)

Fertilizer requirements for top yields should approximate the difference between what vegetables take up from the soil for best growth and quality, and what the soil can actually supply during the crop-growing period. The essential nutrients in soil cannot be determined without a soil test. Moreover, if pH is not in a desirable range, yields may be poor regardless of fertilizer added or already present in the soil.

The soil types in New York State fields, even within relatively small fields, are extremely variable. This is because most of the state was glaciated, digging up and pushing around all the existing topsoil and subsoil. As the glaciers melted soil was moved with the melt water. This action tended to sort the soil particles by size, with the sands settling out first, and the clay particles settling out last. In addition, underlying bedrock was not left smooth. There were gouges made by the ice in softer rock and high spots where harder rock was left, resulting in numerous streams under the ice. (Think of the long, thin gouges of the Finger Lakes). Thus, soil pH and the nutrient-releasing capacity of the soils today, can vary a lot from one field to the next. Using an

"average" rate of phosphorus (P) or potassium (K) fertilizer, for example, will leave some crops deficient in P or K, while other fields are over-fertilized, risking excess P running into streams and lakes, causing undesirable environmental effects.

Fields on which vegetables will be grown should be soil sampled and tested at least once every three years. In general, when the Cornellrecommended rates of fertilizer are applied, low soil test values for phosphorus and potassium increase slowly and steadily in spite of crop removal. Medium soil test values tend to remain constant or increase slightly, whereas high/excess values decrease gradually, with recommended fertilizer applications. The potassium level could decrease much more rapidly, however, if a light sandy soil with relatively low exchange capacity is coupled with a heavy potassium feeder such as potatoes or tomatoes. In such situations, yearly sampling is appropriate. The purpose of applying nutrients, however, is to benefit crop development, not to achieve a predetermined test result.

Soil testing in New York is now done by Dairy One/Agro One, in cooperation

with Cornell University (730 Warren Rd. Ithaca NY 14850; 1-800-344-2697 x2172; or go to: <u>http://dairyone.com/</u> analytical-services/agronomy-services/ soil-testing/. Order sample boxes and Soil Submittal Forms by phone or online. New York growers interested in obtaining Cornell fertilizer guidelines for vegetable crop management should choose "New York samples - Cornell guidelines," and "Commercial Vegetable - Modified Morgan Analysis," to get the correct Soil Submittal Form - V or V2. See: http://dairyone.com/wpcontent/uploads/2014/01/Form-V.pdf Include the necessary field information (soil type and crop to be grown), or fertilizer recommendations cannot be included with your results. Include your check with the sample box and form, and mail to Dairy One Agro-One.

The soil test results provide soil pH, percent of organic matter, and level of phosphorus, potassium, magnesium, calcium, and zinc. Levels of aluminum, iron, and manganese are also listed to identify potential toxicities rather than deficiencies. Other nutrients can be tested for an additional fee. See the nutrient recommendations under each crop to design a fertility program for your farm.

## **Potato Curing and Cooling**

Sandy Menasha, CCE Suffolk County (edited by C. MacNeil, CVP)

Curing: The curing, suberization or wound healing period, is one of the most critical storage phases. Weight loss is highest during the curing phase due primarily to moisture losses from cuts and bruises and high respiration rates. As much as 2-4% of the tuber weight can be lost in the form of water during the first month. If managed properly, this water loss can be used to one's advantage as a means of maintaining a high relative humidity (RH) needed during the wound-healing process. The curing period is also essential for the thickening and setting of the skin. This will increase tuber resistance to moisture loss and minimize entryways for rot-causing disease organisms like soft rot. Wound healing is dependent on temperature and RH. Maintain temperatures in the range of 50-60°F with a RH of 95% for 10 to 21 days. A low

RH will result in poor suberization and the formation of a starchy layer over the bruise preventing healing. Uniform air movement is necessary during the curing process to remove respiration and field heat, to supply oxygen, and to prevent condensation within the pile. If available, a humidifier should be used to maintain the ventilating air at a RH of 95% (if insulation is excellent!). Where a humidifier is not implemented, only naturally occurring humid air should be used for ventilation. If bacterial soft rot, pink rot, tuber late blight, or silver scurf are present eliminate the curing period and cool potatoes immediately to their holding temperature, with a maximum of 85% RH. Sell potatoes with rot potential as soon as possible.

Cooling Period: Immediately after the curing period, tubers should be cooled down to the holding temperature. Potatoes should be cooled slowly. A rapid reduction in storage temperature, followed by a midfall warm spell, will cause condensation, promoting disease development. Cool a maximum of  $4 - 5^{\circ}F$  per week. Use a pulp thermometer to check tuber temperature. Potatoes should be cooled with humid air no lower than 3 - 5°F below the tuber temperature. Temperatures in the pile should not be allowed to build up above 60°F. Check temperatures on the top and in the center of the piles. If these temperatures are above the outside air temperature then ventilate the storage. An exhaust fan is ideal for removing warm air from the top of the storage and bringing in cooler air. O

## **Scouting for Winter Greens Pests**

Elizabeth Buck, CCE Cornell Vegetable Program

With all this rain, it's official. Fall is here and we're just about done with the growing season...unless you happen to grow cool season greens. In that case, the fun is just beginning.

What kind of fun? Well, how about the thrill of watching all your little seedlings germinate, seeing the transplants take root and start growing? With the nice weather the past two weeks, no doubt they are looking good and lush, vigorous, amazingly delicious...for pests.

Turns out that the pests get pretty hungry this time of year, and of course they'll come enjoy that buffet you planted in the tunnel. Slugs are the most common diners, and they're politely not picky about what they eat. Aphids start to move in as their summer food sources die back, cabbage pests find your mustards and kale after the neighborhood cabbage is harvested, and sometimes flea beetles refusing to die and temporarily seek shelter inside. At least the flea beetles will actually die off with the winter.

Most pests set up shop and never leave, munching away happily all winter long. Cold won't kill them. Instead, they just take a little January nap deep in the canopy or just under the soil surface. Don't worry, they'll wake up voraciously hungry on the first sunny day in February. Several times we've documented caterpillars pupating overwinter in a tunnel, and butterflies can emerging in March.

See, a small fall feeding nuisance frequently becomes a big "spring" (ok, February/March) pestilence. Over the course of four years CVP staff followed pest problems in winter high tunnels. After spending that much time counting aphids and examining caterpillar droppings, I can say with confidence that pest populations left unchecked in the fall will be a much larger, significantly more difficult issue in the spring. Two reasons why: 1) the pests continue to multiply, and do so quickly with sunny days in late winter. 2) The control tactics simply do not work in the middle of winter – cold temperatures and dense canopies render them ineffective.

To successfully grow a low-cull winter greens crop, you have to adopt proactive management of pests (and disease). Start with simple things like cleaning up weeds around the tunnel edge. That'll



Scouting winter greens for aphids. Photo: Judson Reid, Cornell Vegetable Program

help minimize aphid problems, especially if you have weedy sowthistles, lambsquarters, and pigweeds and would like to raise a clean lettuce crop. Next take care of weeds inside the tunnel. Chickweed is the worst offender in a winter tunnel, followed by henbit/purple dead nettle, and shepherd's purse. Slugs love to hide out under a weedy canopy, where it stays moist and cool all day.

Next, set the planting up to enjoy lots of good airflow. Use a bit wider spacing, install that louver vent, and make an easy system for pulling row cover on any sunny day, regardless of outside temperature. Better air drainage will decrease humidity. Decreasing humidity goes after both slugs and diseases – two birds, one stone.

Finally, commit to weekly scouting and aggressive treatment. Here's how to be most efficient, should take less than 30 minutes a week/3000 sq ft of a 5-6 species planting. I'm going to lay out the scouting what, where, and how for some common crops. When pest pressure begins ranges from now through Thanksgiving, so start scouting soon.

**Aphids** look like small sesame seeds and can be black, green, rosy, gray, and even yellow. They blend in with the foliage. Look for them on leaf undersides, and protected areas of plants like curled leaf margins, petiole bases, hearts, and next to midribs. **Action threshold**: 1 aphid/leaf.

**Caterpillars** come in 2 types: "cabbage" caterpillars (diamond backs, imported cabbage worms, and loopers) tend to be in the upper 2/3rds of a canopy, on either leaf surface. They are often found on the leaf, though may blend in well, and can be quite small when young. Armyworms and cutworms will feed aggressively and leave tremendous damage on young plantings. They'll go after chard, beets, and lettuce, and transplants before most cole



Catepillar frass. Photo: Elizabeth Buck, Cornell Vegetable Program

crops. You're more likely to see their feeding or large frass pellets than the actual worms. Caterpillars leave frass pellets that may fall to the base or center of a leaf/ plant, and feed by biting, not peeling layers off the leaf. Action threshold for "cabbage type": presence on more than one plant, or more than one caterpillar per plant. Action threshold for other caterpillars: presence.

#### continued - Searching for Winter Greens Pests

Slugs are particularly tricky. I don't find the "look for a slime trail" method reliable. They like to hide in dark, dank places during the day. It works much better to put a small piece of scrap wood down in a couple locations and check underneath. Look in any place that stays moist, like edges of houses, in dense plantings, under



Slug close-up. Photo: Judson Reid, Cornell Vegetable Program

Slug feeding damage and frass. Photo: Elizabeth Buck, CVP

plastic, or in weedy patches. On the crop itself, look for stringy, messy frass and characteristic "layer by layer" feeding patterns. **Action threshold**: Always assume you have slugs. Treat with slug bait at planting and reapply as needed.

#### Kale: Aphids, slugs, and cabbage worms

Pick a plant. Start at the bottom and work your way to the top, giving it a general look for feeding damage, frass, and slime trails. Closely inspect three leaves for damage. The first should be low on the plant, ideally touching but not on the ground. Look for slug feeding, slime, or frass. Aphids will often show up first on lower kale leaves – be sure to look closely along the midrib and in the frilly tips. Next pick a middle leaf, look for aphids and slugs and caterpillars. Caterpillars on middle leaves tend to be on both surfaces and may be small. Choose a small upper leaf that has lots of frills and roll them back to check for caterpillars and frass in the center of the leaf. Check for aphids on all parts, including the frilly margins. Repeat for 10-15 plants. Scouting is similar for leafy brassicas.

#### Spinach: Aphids, slugs, spinach crown mite

Pick 3-6 spots in a planting. At each spot examine 5 plants for slug feeding and abnormally shaped new growth. Spinach crown mite is invisible to the naked eye, but it will present as new growth with small holes in the leaves, puckering, and deformed leaf margins. Examine the leaves for aphids. Pick one plant at each spot and tear it apart, looking for aphids at the base of the leaves and in the crown.



Spinach crown mite damage. Photo: Elizabeth Buck, Cornell Vegetable Program

#### Beets, chard: Aphids, caterpillars, slugs

Caterpillar feeding is very obvious and fairly destructive. You'll have no problem finding it. Slug feeding is common on chard, but not so common on beets. Be sure to check for slug feeding on the juicy leaf stalks. Frass will often roll down to the leaf bases. When beets get aphids, they tend to be badly infested. Catch it early by examining 10-15 plants, checking 2 large and 2 small leaves for aphids. Be sure to look in rolled leaf margins.

#### Lettuce and heading brassicas: Aphids, slugs, caterpillars

Pick 3-6 spots and examine 3-5 plants per spot, more plants if you do fewer spots. Pick one side of the plant and start looking at leaves – both surfaces and don't forget to check on the stalks and leaf bases. Check each leaf following one path to center. Write down the total number of aphids and leaves examined, and divide aphids by leaf to get your pest population. Make note of any slug/caterpillar activity. Remember that frass will often fall to the base of the leaves. •

### 2015 NYS Certified Seed Potato Crop Directory Available Carol MacNeil, CCE Cornell Vegetable Program

The 2015 NYS Certified Seed Potato Directory is now available. There is a wealth of information on NYS potato seed certification, as well as on the 75 varieties grown for certification in 2015. The varieties include standards for processing and tablestock, newer varieties and numbered lines, and specialty/heirloom varieties. Brief summaries of the varieties' maturity, appearance, yield potential, and major disease susceptibility are included. Contact info for the growers with seed supplies of each variety is included. There is also a listing of the inspectors from the NYS Department of Agriculture and Markets in Albany, Rochester and Syracuse.

You can find the <u>Directory online</u> on our website , cvp.cce.cornell.edu, under the potato section.

The NYS Certified Seed Potato Program is part of the New York Seed Improvement Project at Cornell. You can <u>email the program</u> or call 607-255-9869. •

## Chateau Herbicide Applied in Fall Packs Most Punch for Weed Control in Garlic

Christy Hoepting, CCE Cornell Vegetable Program

Weed management is extremely important in garlic production with weed competition causing yield reductions of 30% or more. Although several herbicides are labeled in garlic, conventional garlic growers have been reluctant to use them for fear of crop injury and yield reductions; too high of a risk for such a high value crop. Instead, mechanical and manual cultivation (e.g. hoeing) and hand weeding is relied upon, at an expense of \$450 to \$600 per acre in labor costs alone. Additionally, the labeled uses of the herbicides for garlic tends to mimic their uses in onions, but onions are planted in the spring, while garlic is planted in the fall, so their practicality is questioned.

In 2014 and 2015, we set up three replicated demonstrations of several herbicides labeled in garlic on two farms in Orleans and Genesee counties to evaluate their relative efficacy and crop tolerance. Results showed that a single application of the herbicide Chateau 6 oz/acre applied in the fall pre-emergent to garlic and weeds within 3 days of planting provided excellent control of a wide range of broadleaf weeds right up until harvest (77% control of broadleaf weeds and 49% control of grasses) (Fig. 1 and 2).

The major advantages of Chateau applied in the fall over Buctril applied in the spring were:

- Chateau has superior early pre-emergent activity. By the time we applied Buctril first thing in the spring, some weeds had already emerged, some species of which Buctril could not control, such as pineapple weed.
- Chateau controlled a wider spectrum of broadleaf weeds than Buctril, including some annual grasses. Although, it was notably weak on lamb's quarters.
- 3) Chateau provided superior residual weed control compared to Buctril, which ran out of gas (Fig. 2).

At a cost of only \$35 per acre, use of Chateau in the fall represents a 92% savings in production costs per acre. For season-long control of annual grasses and additional broadleaf weed control, Dual Magnum, Outlook or Prowl can be applied in the spring for only an additional \$20 per acre. Both of the grower cooperators were very impressed with the results and are planning to use Chateau this fall, and a grass herbicide next spring where needed.

In our trials, Chateau was trialed on both hard and soft neck garlic, and although we do not have crop tolerance data from very early spring, our grower cooperator noted that the soft neck garlic appeared to have taken some injury from the fall-applied Chateau. By May 12, garlic that had been treated with Chateau in the fall had minor injury, if any at all. Analysis of our yield data is still in progress.



Figure 1. On-farm demonstration of fall-applied herbicide, Chateau (right) compared to untreated check (left). Treatments were applied in an 18 inch swath over the row, the grower cultivated between the rows. *Photo taken May 12, 2015 by C. Hoepting.* 



**Figure 2.** Weed control at garlic harvest on July 16. Compared to the untreated *(left)*, Chateau applied in the fall *(middle)* provided 77% control of broadleaf weeds, while Buctril 1 pt applied in the spring, although initially effective, had less than 3% control of broadleaf weeds, because it does not control as broad of a spectrum of species or have any residual control. Note, that there were very few grasses at this trial site; for best control of all weeds, Chateau should be followed with a grass herbicide in the spring. The browning of the garlic in this trial was not related to herbicides; unfortunately, it was afflicted with a leaf disease. *Photos: C. Hoepting.* 

Prowl EC/H<sub>2</sub>O may also be applied in the fall pre-emergent to the garlic and weeds. In a previous trial, fall-applied Prowl provided very good control of grasses and selected broadleaf weeds; control was further improved when it was used in combination with Chateau. Prowl does not have as long of a residual effect as Chateau does, and we found that for grass control, Prowl performed better when it was applied in the spring, because the spring application was better timed to when grasses emerge and then its residual extends farther into the growing season. Though, the fall application of Prowl did help with early control of selected broadleaf weeds.

If you are interested in trialing Chateau this fall, we recommend doing so on a trial basis so that you can see how it performs on your farm with your varieties of garlic, weed spectrum, soil type and planting system.

Once our data is summarized, complete reports will be available on the CVP website and details regarding use of grass herbicides will be available in a spring issue of VegEdge. Note: Chateau is not labeled for use in the spring, and caused injury to the garlic in our trials when used in this manner.

## UPCOMING EVENTS

view all Cornell Vegetable Program upcoming events at cvp.cce.cornell.edu

#### Cover Crop and Reduced Tillage Workshop for Organic Vegetable Growers



October 16, 2015 | 9:30 AM - 3:30 PM USDA-NRCS Big Flats Plant Materials Center\* 3266 State Route 352, Big Flats, NY 14814

Growers, NRCS and Cornell staff, and an agribusiness rep will present practical information on cover crop choice and reduced tillage options. There will also be field demonstrations and a cover crop tour. Lunch is available for \$10. To see the complete agenda, and to preregister, to go: <a href="http://events.constantcontact.com/register/event?">http://events.constantcontact.com/register/event?</a> IIr=fzz4ttqab&oeidk=a07ebazbqlv59c0ed3d

Questions, special needs, contact Paul Salon: 607-562-8404 x103 or paul.salon@ny.usda.gov

\*Directions: From Route 17 (I 86) take Exit 48 (East Corning/Route 352). Follow Route 352 east for 1.5 miles. PMC entrance is on the left.

Sponsored by: USDA-NRCS Plant Materials Program, Cornell Cooperative Extension, and the Upper Susquehanna Coalition

## 2015 Annual Cover Crop Workshop and Field Tour



November 6, 2015 | 9:15 AM - 3:30 PM Big Flats, NY\* (new starting location!)

The fine points of cover crop establishment, maximizing growth, and use, will be presented by a grower and consultant, and Penn State, Cornell and University of VT speakers. After lunch the group will move to the USDA-NRCS Big Flats Plant Materials Center, 3266 State Route 352, where there will be a tour of cover crop establishment and growth by Paul Salon, NRCS. Lunch is available for \$10. To see the complete agenda, and to preregister, go to:

#### http://events.constantcontact.com/register/event? llr=fzz4ttqab&oeidk=a07eban6peya1a81ef5

Questions, special needs contact Paul Salon at: <u>paul.salon@ny.usda.gov</u> or 607-562-8404 x103.

\*Directions: To the morning program at the Big Flats Community Building, 476 Maple St, Big Flats, NY 14814: Take Route 17 (I 86) to Exit 49 (from west make right off ramp, from east make left). At "T" make left. At the 4-way stop, continue straight. On right hand side, you will see a sign Town of Big Flats Municipal Campus Community Building, about 100 yards on right.

### 2016 Empire State Producers Expo

#### January 19-21, 2016 Oncenter Convention Center, Syracuse, NY

This show combines the major fruit, flower, vegetable, and direct marketing associations of New York State in order to provide a comprehensive trade show and educational conference for the fruit and vegetable growers of this state, as well as the surrounding states and Eastern Canada. The Cornell Vegetable Program Specialists are involved in organizing sessions on Processing Vegetables, Potatoes, Onions, Cabbage/Cole Crops, Soil Health, Weed Management, Climate Change, Beginning Farmers, High Tunnels, and Specialty Vegetables.

Registration will open later this year on the NYS Vegetable Growers Association website <u>nysvga.org/expo</u>.





Cornell University Cooperative Extension Cornell Vegetable Program

480 North Main Street Canandaigua, NY 14424





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.

### VEGETABLE SPECIALISTS

**Robert Hadad** | 585-739-4065 cell | rgh26@cornell.edu food safety & quality, organic, business & marketing, and fresh market vegetables

Christy Hoepting | 585-721-6953 cell | 585-798-4265 x38 office | cah59@cornell.edu onions, cabbage and pesticide management

Julie Kikkert | 585-313-8160 cell | 585-394-3977 x404 office | jrk2@cornell.edu processing crops (sweet corn, snap beans, lima beans, peas, beets, and carrots)

Carol MacNeil | 585-313-8796 cell | 585-394-3977 x406 office | crm6@cornell.edu potatoes, dry beans, and soil health

Judson Reid | 585-313-8912 cell | 315-536-5123 office | jer11@cornell.edu greenhouse production, small farming operations, and fresh market vegetables

Darcy Telenko | 716-697-4965 cell | 716-652-5400 x178 office | dep10@cornell.edu soil health, weed management, plant pathology

For more information about our program, email cce-cvp@cornell.edu or visit us at CVP.CCE.CORNELL.EDU

#### **PROGRAM ASSISTANTS**

Elizabeth Buck | 607-425-3494 cell | emb273@cornell.edu

Missy Call | mmc253@cornell.edu

John Gibbons | 716-474-5238 cell | jpg10@cornell.edu

Cordelia Hall | ch776@cornell.edu

**Nelson Hoover** 

#### ADMINISTRATION

Angela Parr | 585-394-3977 x426 office | aep63@cornell.edu

Steve Reiners | sr43@cornell.edu



Cornell University Cooperative Extension Cornell Vegetable Program

Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.