With potatoes moving into storage, it’s possible you may be seeing some concerning marks or brown spots on your tubers. Identifying one problem from another can sometimes be tricky, so this guide can help you understand the signs of some common potato diseases. If you see signs of disease in your potato tubers, contact your local specialist to collect samples for confirmation.

BRUISING
Brown or black spots on your potato tubers don’t necessarily mean disease, and could be signs of bruising caused by rough post-harvest handling of the tubers. Bruising often presents as black spots within the flesh of the tuber, often around damaged skin. Damage to tubers during harvest can also create pathways for other diseases to enter. Make sure to exercise best handling practices at harvest to reduce damage and bruising to tubers.

SCAB – COMMON AND NETTED
Common and netted scab are caused by different species of bacteria in the genus Streptomyces. Common scab can be identified by corky lesions on the tuber surface (flat, raised, or pitted), while netted scab presents as brown net-like lesions covering some to all of the potato surface. This pathogen can overwinter in soils, and is easily transferred by splashing water, wind, or farm equipment.
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 14424 Email: cce-cvp@cornell.edu
Web address: cvp.cce.cornell.edu

Contributing Writers
Elizabeth Buck
Robert Hadad
Christy Hoepfing
Margie Lund
Julie Kikkert
Judson Reid

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The next issue of VegEdge newsletter will be produced on December 2.

USDA to Collect Vegetable Data in the Northeastern United States

USDA National Agricultural Statistics Service, Northeastern Regional Office

HARRISBURG, PA– In the coming months, the U.S. Department of Agriculture’s (USDA) National Agricultural Statistics Service (NASS) will conduct the Vegetable Grower Inquiry Survey. The agency plans to visit vegetable growers across the United States, including over 4,000 in the Northeastern Region.

NASS conducts this vegetable survey once per year to obtain the final acreage, production, and value of sales for fresh and processed vegetables. “When growers respond to these surveys, they provide essential information that helps us determine the production and supply of these commodities in the United States for the 2019 crop year. Everyone who relies on agriculture for their livelihoods is interested in the results,” explained King Whetstone, director of the NASS Northeastern Regional Field Office.

NASS gathers the data for these surveys online, by mail, over the phone and through in-person interviews. The surveys will be conducted from October 29, 2019 through December 19, 2019. Growers provide information on crop acreage, production, and value of sales. NASS will compile and analyze the survey data and publish the results in a series of USDA reports, including the Annual Vegetable Release, scheduled for February 13, 2020.

“NASS safeguards the privacy of all responses and publishes only State and National level data, ensuring that no individual operation or producer can be identified,” stated Whetstone. “We recognize this is a hectic time for farmers and ranchers, but the information they provide helps U.S. agriculture remain viable and capable. I urge them to respond to these surveys and thank them for their cooperation,” said Whetstone.

All reports are available on the NASS website: https://www.nass.usda.gov/Publications/. For more information on NASS surveys and reports, call the NASS Pennsylvania Field Office at (800) 498-1518.
It can also be introduced via the potato seed. Warm, dry soils with a pH above 5.2 are conducive to scab formation, so making sure soils are well irrigated in the weeks following tuberization could help lower levels. Additionally, if soil pH is high, amending soils with sulphur or cover crops may help reduce the soil pH and scab on tubers. Some varieties of potatoes are more susceptible to scab than others, so if you have had problems with scab in the past you may want to consider planting resistant varieties. Potatoes with common and netted scab are still edible, though it will decrease the marketability of the tubers.

**SCURF – SILVER AND BLACK**

**Silver scurf** is caused by the fungus *Helminthosporium solani*. Tubers become infected during the growing season from fungus present on the seed tubers or volunteers, and start to show symptoms a few weeks after infection. Therefore, symptoms may not appear until after potatoes are in storage. Early symptoms appear as brown, circular lesions on the skin surface with distinct margins. Over time, lesions may merge together and turn silver. Silver scurf lesions also cause excessive water loss, so infected potatoes may become shriveled over time. Using disease-free seed, controlling volunteers, and crop rotation are the first step to avoid silver scurf. If you continue to see problems with a certain variety, harvesting as early as possible can help decrease the potential of mature tubers becoming infected. If you are storing potatoes that you suspect may have silver scurf, reducing humidity and temperature levels as low as possible will decrease sporulation and spread of the disease in storage. Fungicides are also available for application to tubers going into storage. Silver scurf can decrease marketability and lead to economic losses from shrinkage due to water loss by the skin lesions.

**Black scurf** is caused by the fungus *Rhizoctonia solani*. The black masses on the skin of the tuber are sclerotia, or dormant bodies, and do not cause any damage to the tuber itself. Potatoes can become infected if grown in soils with high fungus levels, or by contaminated seed. Cool, wet soils early in the growing season increase the chances of infection. Crop rotation and planting disease-free seed are good management strategies. Additionally, harvesting potatoes soon after vine kill and skin set can help reduce black scurf on the tubers. Sclerotia can only form on tubers in the soil, so once harvested and in storage there is no further concern of potato rot or spread to other tubers.

**POTATO VIRUS Y (PVY)**

PVY is a virus that causes potato tuber necrotic ringspot disease. PVY is introduced into a field through infected seed or infected volunteer plants, and can be spread by aphids. Tubers that have become infected develop brown or reddish rings on the surface that over time will become sunken and necrotic, and may extend into the flesh of the potato below the rings. Once a plant is infected, the disease cannot be eradicated. The best way to ensure you don’t get PVY is to use disease-free seed and destroy any volunteers, as well as planting resistant potato varieties. Necrosis of tubers can increase during storage, leading to rotting of tubers, so make sure all infected tubers are removed prior to storage.

**FUSARIUM DRY ROT**

Dry rot is caused by infection from fungal species in the genus *Fusarium*, and appears as an internal rot that can be light colored to dark brown/black, and is usually dry. Infection often develops at an injury point, and once infected can lead to the center of the tuber rotting out. There is often also white or yellow mold present. *Fusarium* can be introduced to the soil via seed tubers, and can survive in soil for long periods of time. However, tubers often aren’t infected until harvest, as that is when tubers are most often damaged. Dry rot can be spread in storage, so make sure tubers are properly cured to allow wounds to heal, and drop storage temperatures slowly so condensation doesn’t form. Make sure to monitor potatoes in storage, and grade out any infected tubers to reduce spread to healthy potatoes. Potatoes infected with dry rot are often secondarily infected with soft rot bacteria, leading to slimy tubers and masked dry rot symptoms, especially when condensation is high in storage. Fungicides are also available for application to tubers going into storage.
LATE BLIGHT
Late blight is caused by the fungus-like pathogen *Phytophthora infestans*, and can infect potato tubers both in the field and in storage. Tubers initially become infected in the field, anytime between early tuberization and harvest, by sporangia that are washed off of infected foliage into the soil. Signs of late blight in tubers are irregularly shaped, brown to black skin lesions. The flesh of the tuber may develop a tan or brown dry rot that extends into the tuber from the infected skin lesions. Potatoes infected with late blight often become secondarily infected with soft rot, internal late blight symptoms might be masked. Harvested tubers that show signs of late blight should be removed, and remaining tubers should be stored in cool, dry conditions to reduce condensation and subsequent spread of late blight or secondary infection by soft rot. Using certified disease-free seed, planting resistant varieties, and maintaining a protectant fungicide spray program throughout the growing season are important control measures for reducing late blight in tubers. Fungicides are also available for tubers going into storage.

BACTERIAL SOFT ROT
Soft rot in potato tubers is caused by many different bacteria, and causes soft, wet rot that may be cream or brown colored. Potatoes infected with soft rot will be slimy and often develop a fishy or bad-smelling odor. Soft rot can enter the tuber through lenticels, as well as growth cracks or injuries, and is often a secondary infection to other diseases. To avoid soft rot, make sure you plant disease-free seed, and ensure good handling practices at harvest to avoid damage to tubers. Potatoes should be properly cured going into storage to heal any wounds, and temperatures lowered slowly to avoid condensation forming on the tubers which helps spread soft rot. Infection is highest shortly after harvest, and will decrease during storage. However, the bacteria can remain on debris in storages from year to year, so proper sanitation of storage facilities is important to reduce spread to tubers in storage.

Seed Treatment Recommendations for Onion Maggot Control in 2020
Erica Moretti and Brian Nault, Department of Entomology, Cornell AgriTech, Cornell University, Geneva, NY, and Christy Hoepting, CCE Cornell Vegetable Program

Just as the 2019 onion crop is going into storage, it is already time to start thinking about seed orders including seed treatments for next year’s crop! This article focuses on what insecticide options to consider for managing onion maggot, the number one early-season insect pest (Fig. 1). Adult flies cannot be killed effectively with insecticides, and there are no rescue treatments for onion maggot larvae once onions are infested. This means that selecting an effective insecticide seed treatment is crucial to protect the crop.

Figure 1. Onion maggot damage in the field seen early in the season. Plants infested with onion maggot become flaccid and limp aboveground (A) from the larvae feeding on the belowground portion of the plant (B). Photos courtesy of E. Moretti.
Trigard recommended in 2019 for insecticide resistance management
In 2018, Brian Nault’s onion maggot seed treatment trial results in Oswego showed that control of onion maggot was significantly better with Trigard (65%) than FarMore FI500 (34%) under very high pressure (87% plants killed in untreated check), and control with FI500 was noticeably worse (34%) than it was in the previous year (67%). It is unknown whether the onion maggot population was developing resistance to FI500. Nonetheless, these results informed our recommendation to rotate away from FarMore FI500 to Trigard in 2019 for judicious management of insecticide resistance.

FarMore FI500 was as good as Trigard in 2019 trials
In 2019, in a late-planted field in Oswego, onion maggot pressure was slightly lower than it was in 2017-18, but still quite high with 63-67% loss in the untreated checks (Fig. 2). In this year’s trials, there were no significant differences between Trigard (67% control), Regard + Cruiser (57% control), which are the insecticides in FarMore FI500 (a.i. spinosad + thimethoxam), and Regard (a.i. spinosad) alone (57% control) (Fig. 2 Trial 1). Trigard + Cruiser (73% control) performed equally well as Regard + Cruiser (73% control) (Fig. 2 Trial 2). The Regard component of FI500 continues to be the workhorse in this treatment for onion maggot control because Regard alone performed as well as Regard + Cruiser (= FarMore FI500) and Cruiser alone was no different than the untreated check (Fig. 2). This is great news! We did not see a slip in performance in either FarMore FI500 or Trigard.

Rotate FI500 (or Regard) and Trigard annually for best resistance management.
Regard (doing the work in FI500) and Trigard belong to different modes of action; IRAC (Insecticide Resistance Action Committee) Groups 5 and 17, respectively. The best way to conserve these chemistries and slow down resistance is to alternate between these active ingredients on an annual basis to minimize exposure of the insect to the same insecticide class, even in low-pressure fields. Do your best to rotate annually between FarMore FI500 and Trigard per isolated muck pocket. It does not have to be perfect, but we should strive to get on a complete acreage rotation per isolated muck pocket moving forward.

Example:

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<thead>
<tr>
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<th>2019</th>
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<th>2021</th>
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<tr>
<td></td>
<td>Majority of acreage in isolated muck pocket treated with Trigard</td>
<td>Treat all this acreage with FarMore FI500</td>
<td>Treat all this acreage with Trigard</td>
</tr>
<tr>
<td></td>
<td>Majority of acreage in isolated muck pocket treated with FarMore FI500</td>
<td>Treat all this acreage with Trigard</td>
<td>Treat all this acreage with FarMore FI500</td>
</tr>
<tr>
<td></td>
<td>Onion acreage in muck pocket divided between Trigard and FarMore FI500 (e.g. Elba muck)</td>
<td>Treat all acreage with FarMore FI500</td>
<td>Treat all this acreage with Trigard</td>
</tr>
</tbody>
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Will Trigard be available in 2020?
Based on Brian Nault’s encouraging results with Trigard this year (Fig. 2 - Trial 2), Syngenta is interested in working with him in 2020 to continue investigating the performance of a new “FI500 package” with Trigard substituted for Regard. Brian has encouraged Syngenta to keep Trigard available as a seed treatment option because it is effective and would be an excellent rotation partner with Regard. Syngenta representatives are currently in the process of making a decision about whether or not to make it available for commercial seed treatment companies. Ironically, Syngenta is the registrant for FarMore FI500, Regard and Trigard. Stay tuned! If Trigard is not available for 2020, then use FarMore FI500 in 2020, and HOPEFULLY back to a new FarMore-like package that includes Trigard in 2021 – fingers crossed!

Sepresto and Lorsban
Despite performing as well as Regard and Trigard this year (Fig. 2A), Sepresto has not historically controlled onion maggot very well when applied in commercial seed treatments in New York, and we do not recommend it for most situations. Similarly, drench applications of Lorsban (a.i. chlorpyrifos) alone failed to control onion maggot again in 2019, as populations are resistant (Fig. 2A). Neither Sepresto nor Lorsban alone are recommended for managing moderate to high onion maggot infestations based on their performance in this and past year’s studies.

Figure 2. Evaluation of insecticide seed treatments for control of onion maggot in two commercial onion fields in Oswego County in 2019. In Trial 1 (n=5) all seeds were treated with penflufen and thiram for seedling disease control, and in Trial 2 (n=5) all treatments included the FarMore F300 seed treatment package (Dynasty + Maxim + Apron); Regard + Cruiser* is equivalent to FarMore FI500. Bars in the same trial followed by the same letter are not significantly different, P > 0.05, Tukey’s HSD Test.
Produce Safety Alliance Grower Training (FSMA)
November 18-19, 2019  |  9:00 AM - 5:00 PM (Nov 18) and 9:00 AM - 3:00 PM (Nov 19)
CCE Broome County, 840 Front St, Binghamton, NY 13905

Do you want to understand produce safety issues as they relate to the Food Safety Modernization Act (FSMA) Produce Safety Rule, third party audits, or Good Agricultural Practices (GAPs)? Participation in this training will give you the tools to create an on-farm food safety plan and complete the training requirement for FSMA. You will leave on the second day with the framework for a food safety plan for your farm.

Cost: $100/farm and includes 2 registrations, all meals, manual and AFDO certificate. 2 DEC credits available 1a, 10, 22 & 23. If you have questions, please contact Laura Biasillo at lw257@cornell.edu or 607-584-5007.
Processing Vegetable Crops Advisory Meeting
December 17, 2019 (Tuesday)
First United Methodist Church, 8221 Lewiston Rd. (Route 63),
Batavia, NY 14020
9:30 AM – 12:10 PM Beans and Sweet Corn
12:15 PM – 1:00 PM Complimentary Lunch
1:00 PM – 2:00 PM Peas
2:00 PM – 3:30 PM Carrots and Beets

All are invited to attend and discuss the 2019 season for each crop, meet the new Cornell Weed Scientist and discuss weed management concerns, and receive updates on research conducted during 2019. Separate DEC and CCA credits will be available for each of the 3 crop meetings. The meeting is free of charge and there is no registration required. Questions? Contact Julie Kikkert, 585-313-8160.

Irrigation Training for Small Farms
November 20, 2019 (Wednesday) | 9:30 AM - 3:30 PM
Off Duty Inc, 5184 State Route 244, Belmont, NY 14813

Please join us for a vegetable and berry growers meeting about irrigation systems. Featured speakers include Steve Reiners, Professor and Chair of the Horticulture Section, Cornell University, and Liz Madison from Empire Drip Supply.

Cost: $10/person. Pre-registration is required by November 18. For more information on the event or to make phone reservations, contact Lynn Bliven at 585-268-7644 ext. 18, or email reservations to lao3@cornell.edu to hold your spot and pay at the door. Hosted by CCE Allegany County, Allegany County Soil & Water Conservation Service and Natural Resource Conservation Service.

Farm Food Safety 2-Day Training with GAPs
December 3-4, 2019 (Tues-Weds) | 8:30 AM - 4:30 PM
CCE Erie County, 21 South Grove St, East Aurora, NY 14052

This training is geared for fresh produce farms looking to learn and implement food safety practices into their operations. If you are looking to find new markets, many buyers are requiring food safety training. Under the GAPs (Good Agricultural Practices) program this training will help prepare you for implementing food safety practices and move you forward for audit/certification through NY State Dept of Agriculture. If you are looking to sell to farm to school programs, many school districts require a training course.

The GAPs training is a 2-day program:
Day 1 covers the details and reasoning for food safety along with the practices that you can use for your own unique farming operation.

Day 2 is for those attendees who want to write a farm food safety plan. We will assist you with developing a plan that fits your needs. If you want a GAPs audit/certification, you need a farm food safety plan. A plan is a good thing to have anyway because it helps give you a road map for implementation of practices. Laptop computer will be needed for Day 2.

Cost is $50/person for 2 days, or $75 per farm (maximum 2 people from each farm). Register online For more information, contact Robert Hadad at 585-739-4065 or email Robert.
VegEdge is the highly regarded newsletter produced by the Cornell Vegetable Program. 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

Elizabeth Buck | 585-406-3419 cell | emb273@cornell.edu
fresh market vegetables, weed management, and soil health

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

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

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

Margie Lund | 607-377-9109 cell | mel296@cornell.edu
potatoes, dry beans, and post-harvest handling and storage

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

PROGRAM ASSISTANTS

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

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

Sarah Vande Brake | sv483@cornell.edu

Emma van der Heide | ev247@cornell.edu

Caitlin Vore | cv275@cornell.edu

ADMINISTRATION

Peter Landre | ptl2@cornell.edu

Steve Reiners | sr43@cornell.edu

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

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