Two common insect pests of cabbage and related crops in New Jersey are active in early spring. The *cabbage flea beetle*, *Phyllotreta albionica* (LeConte), and the *imported cabbageworm*, *Pieris rapae* (Linnaeus), are two pests that can be found in the field at this time.

**Flea Beetles.** Cabbage flea beetles are native to New Jersey, feeding primarily on cruciferous plants, including broccoli, Brussels sprouts, cabbage, cauliflower, Chinese cabbage, kale, kohlrabi, radish, rutabaga, and turnip, as well as many cruciferous weeds. Adults overwinter in protected areas and become active in March and April if conditions are favorable, feeding on host plants and depositing eggs in the soil at the base of the plants. Adult feeding appears as small holes in the leaves or notches in leaf edges at first. Multiple holes appear as the population increases, and then the holes dry out and tear in the wind, or expand as the leaf size increases. Larvae that hatch from eggs in the soil feed on the roots of the plants for about 4 weeks or so during late May – July, but generally cause little damage.

Treatment is recommended if there is one beetle per transplant or 5 beetles per 10 plants during the cotyledon stage of plant development. Many materials are labeled and effective, including acetamiprid (Assail), carbaryl (Sevin), clothianidin (Belay), dinotefuan (Scorpion), endosulfan (Thionex), imidacloprid (Admire/Provado), thiamethoxam (Actara, Voliam xpress), or any of a number of pyrethroids (beta-cyfluthrin, bifenthrin, cyfluthrin, esfenvalerate, gamma-cyhalothrin, lambda-cyhalothrin, zeta-cypermethrin, and combinations of these).

**Imported Cabbageworms.** Imported cabbageworms were believed to be imported into Canada around 1860, and were first observed in New Jersey in 1869. The adults are the common white butterfly seen fluttering around cabbage fields in early spring. Adults do not feed, but larvae feed on nearly all plants in the family Cruciferae, including broccoli, Brussels sprouts, cabbage, Chinese cabbage, cauliflower, collards, horseradish, kale, kohlrabi, mustards, radish, turnip, and many weeds and flowers. Larvae chew numerous holes in the foliage, and if populations are high, are capable of defoliating and killing or severely damaging young plants. Larvae pupate on the plant, forming a chrysalis that is attached to the leaf by several tiny threads. Early season protection is important, as damaged plants may not form.
Vegetable IPM Update
Kristian Holmstrom, Research Project Coordinator II, Vegetable IPM Program

Rutgers Cooperative Extension IPM personnel are currently deploying the blacklight trap network throughout the state. Sampling will commence within one week, and insect data will be published in this newsletter and on the web at: http://www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm as soon as target pests begin to appear. In addition to European corn borer, corn earworm and beet armyworm (July-Sept), we will publish data on brown marmorated stink bug (BMSB) populations from blacklight samples. Building an archive of BMSB populations will enable us to match adult counts with injury levels on specific crops and will ultimately result in more accurate control decisions.

Cole crops

Recently emerged or transplanted broccoli, cabbage, etc. crops are being fed upon by crucifer flea beetles at this time. This pest is capable of significant injury on young plants, and must be controlled. Crops like mustard greens and arugula are particular favorites of crucifer flea beetle. Begin scouting as soon as plants are in the field. Check 5 consecutive plants in 10 random locations for the presence of flea beetles and damage. Consider treating if flea beetles are found on 50% or more plants and fresh damage is apparent. If plants were treated with a systemic insecticide, it is possible for some flea beetles to be present on the leaves. These individuals are typically not active, and foliar damage will be limited.

Vegetable Disease Update
Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology and Wesley Kline, Ph.D., Cumberland County Agricultural Agent

✔ Asparagus - Purple spot - Purple spot has shown up on asparagus this past week. The fungus is easily identified by the numerous small lesions with purple margins on emerging spears. The disease is favored by extended cool, wet conditions. Once weather warms up the disease will quickly disappear.

✔ Asparagus – Phytophthora crown and spear rot – In fields with low spots (poorly drained soils) or fields with a history of crown and/or spear rot apply Ridomil Gold 4SL (mefenoxam, 4) at 1.0 pt/A, or Ultra Flourish 2E/A (mefenoxam, 4) at 2.0 pt/A, or MetaStar 2E (metalaxyl, 4) at 2.0 qt/A over beds just before 1st harvest. For new plantings, apply the same after planting or after crown covering. Do not apply Ridomil or MetaStar one day prior to harvest or illegal residues may result. For more information please see 2011 New Jersey Commercial Vegetable Production Recommendations Guide.

✔ Cabbage – Damping-off – To help control losses due to damping-off pathogens apply Ridomil Gold (mefenoxam, FRAC code 4) at 1 to 2 pt/A 4SL or Quadris (azoxystrobin, 11) at 0.40 to 0.80 fl oz 2.08SC/1000 row ft (for Rhizoctonia only), or Ridomil Gold at 1 to 2 pt/A 4SL plus Quadris at 0.40 to 0.80 fl oz 2.08SC/1000 row ft in a band up to 7 in. after seeding. For more information please see 2011

See Diseases Update on page 3
Calcium Deficiency in Tomato Crops
Meredith Melendez, Senior Program Coordinator Agriculture, Mercer County and Michelle Infante Casella, Gloucester County Agricultural Agent

Calcium's nutritional role is varied in both plants and the soil. It is an integral part of plant cell wall structure. In the soil calcium has the ability to neutralize acidity. A large amount of calcium is absorbed by tomato plants. Only a small portion of the absorbed calcium is used in forming the fruit, although this amount is extremely important. The vast majority of the absorbed calcium can be found within the vegetative structures of the plant. Calcium is an important component of pectin, the substance that helps hold adjacent cell walls together, and allows for gelling of the cytoplasmic fluid. Clay soils have a higher holding capacity for calcium compared to sandy soils.

Calcium's role in the cell wall structure is the causal factor of blossom end rot in tomatoes. Calcium may be present in the soil, but may not enter the plant roots if soil moisture levels are deficient. Calcium is absorbed through a process called “mass flow” which means it is absorbed through the roots when contained in the soil water. Drought stress prevents the tomato from absorbing available water, and therefore available calcium. Calcium deficiency in tomato can also result from excessive magnesium levels with lower calcium soil levels. Magnesium and calcium are both divalent cations and therefore can compete with each other for uptake into the plant. It is reported that the first publication of an ideal Ca/Mg ratio came from New Jersey in 1901. This early work recommended a “total” Ca to “total” Mg ratio in the soil of about 5/4. Both nutrients can leach readily in light soils.

The most notable foliar symptom of calcium deficiency in tomatoes is the appearance of chlorotic leaves at the upper portion (newer leaves) of the plant. Calcium is immobile in the plant and unable to move from the older leaves to support the newer foliar growth. N, P, and K deficiencies also exhibit chlorosis of the leaves but are all mobile within the plant. Therefore the N, P and K deficiencies show on the older leaves. Other calcium deficiency symptoms in tomatoes can include: reduced vegetative growth, thick woody stems, affected root tips, weak and flabby leaves and stems, necrosis of the terminal buds, spotting and necrotic areas of the terminal stem, and short branched roots that are dark brown in color. Therefore, calcium deficiency can cause unsalable fruit, poor plant growth and reduce overall yield. It is important to soil test for calcium and adjust levels and pH before planting a tomato crop or any crop. For more information on soil testing for major plant nutrients see http://njaes.rutgers.edu/pubs/ and select FS719 -Soil Fertility Test Interpretation - Phosphorus, Potassium, Magnesium, and Calcium.
LETTER FROM PAGE 3

Lettuce drop (Sclerotinia) which may cause potential problems. For Bottom rot, Endura 70W (bosalid, FRAC code 7) at 8.0 to 11.0 oz 70W/A, or iprodione (FRAC code 2) at 1.5 to 2.0 lb 50WP/A or OLF should be applied one week after transplanting or thinning and 10 and 20 days later. For Lettuce drop, apply Endura (FRAC code 7) at 8.0 to 11.0 oz 70WG/A, or Botran (dichloran, FRAC code 14) at 2.0 to 5.5 lb 75WP/A, or iprodione (FRAC code 2) at 1.5 to 2.0 lb/A beginning one week after transplanting or thinning and again at 10 and 20 days later. For more information on control of Bottom rot and Lettuce drop and other important diseases of lettuce please see the 2011 New Jersey Commercial Vegetable Production Recommendations Guide.

✔ Pepper – Phytophthora blight

For control of the crown rot phase of blight:

Apply 1.0 pt Ridomil Gold 4SL/A or 1.0 qt Ultra Flourish 2E/A (meufenoxam, 4), or MetaStar (metalaxyl, 4) at 4.0 to 8.0 pt 2E/A.

Apply broadcast prior to planting or in a 12- to 16-inch band over the row before or after transplanting. Make two additional post planting directed applications with 1 pint Ridomil Gold SL or 1 qt Ultra Flourish 2E per acre to 6 to 10 inches of soil on either side of the plants at 30-day intervals. Use formula in the “Calibration for Changing from Broadcast to Band Application” section of Calibrating Granular Application Equipment to determine amount of Ridomil Gold needed per acre when band applications are made.

When using polyethylene mulch, apply Ridomil Gold 4SL at the above rates and timing by injection through the trickle irrigation system. Dilute Ridomil Gold 4SL prior to injection to prevent damage to injector pump. Do not use mefenoxam or metalaxyl if insensitive strains of Phytophthora capsici are present.

✔ Spinach (White Rust and Downy Mildew)

Beginning 2 to 3 weeks after emergence (and prior to symptom development), apply the following on a 7 to 10 day schedule: Quadris (azoxystrobin, 11) at 6.0 to 15.5 fl oz 208SC/A, or Cabrio (pyraclostrobin, 11) at 12.0 to 16.0 oz 20EG/A, or Reason (fenimidazole, 11) at 5.5 to 8.2 fl oz 500SC/A, or Tanos (amoxodone + cymoxanil, 11 + 27) at 8.0 to 10.0 oz 50W/A. Rotate to one of the following fungicides: Revus (manipropamid, 40) at 8.0 fl oz 208F, or Presidio (fluopicolide, 43) at 3.0 to 4.0 fl oz 4SC/A, or Actigard (acibenzolar-S-methyl, P) at 0.50 to 0.75 oz 50WG/A, or Alite (fosetyl Al, 33) at 3.0 lb 80WDG/A, or fixed copper (FRAC code M1) at labeled rates (Copper containing fungicides may cause some phytotoxicity), or Ridomil Gold Copper (mefenoxam + copper, 4 + M1) at 2.5 lb 65WP/A (on 14-day schedule). For more information please see the 2011 New Jersey Commercial Vegetable Production Recommendations Guide.

✔ Strawberry – Anthracnose fruit rot

Strawberry anthracnose can be extremely destructive during warm, wet weather causing significant fruit rot. Symptoms of Anthracnose include blackish-brown circular spots on maturing green fruit and soft, sunken (flat) circular lesions on ripe fruit. On ripe fruit, lesions can expand rapidly and are often covered with a pinkish-orange spore mass. Spores are spread from infected to healthy fruit with splashing water. Control of Anthracnose always begins with a 7 to 10 day preventative spray program no later than 10% bloom and/or prior to disease development. For control apply the following combinations:

1) captan (M3) at 4.0 lb 50WP/A plus Pristine (pyraclostrobin + boscalid, 11 + 7) at 18.5 to 23.0 oz 38WG/A
2) captan (M3) at 4.0 lb 50WP/A plus Abound (azoxystrobin, 11) at 6.0 to 15.5 fl. oz 208SC/A or Cabrio (pyraclostrobin, 11) at 12.0 to 14.0 oz 20EG/A
3) Captivate (captan + fenhexamid, M3 + 17) at 3.5 to 5.25 lb 68WDG/A

For subsequent applications, alternate: captan (M3) at 4.0 lb 50WP/A plus Abound (azoxystrobin, 11) at 6.0 to 15.5 fl oz 208SC/A or Cabrio (pyraclostrobin, 11) at 12.0 to 14.0 oz 20EG/A plus captan (M3) at 4.0 lb 50WP/A, or Captivate (captan + fenhexamid, M3 + 17) at 3.5 to 5.25 lb 68WDG/A

To help manage fungicide resistance development, do not make more than 2 consecutive applications of either: Pristine (pyraclostrobin + boscalid, 11 + 7), Cabrio (pyraclostrobin, 11) or Abound (azoxystrobin, 11) before switching to another fungicide chemistry.

✔ Strawberry – Botrytis (Gray Mold) and Blossom blight – can cause serious losses in strawberry plantings in high tunnels and the field if not controlled properly. Development is favored by moderate temperatures (59 to 77°F) with prolonged periods of high relative humidity and surface wetness. Control of Gray mold begins with preventative fungicide applications. Apply at 5 to 10 percent bloom and every 10 days until harvest. During periods of excessive moisture, spray intervals of 5 to 7 days may be necessary. Rotate fungicide chemistries to aid fungicide resistance management.

Application #1: captan (M3) at 4.0 lb 50WP/A plus Topside M (thiophanate-methyl, 1) at 1.0 lb 70WP/A or Switch (cyprodinil, 9) at 11.0 to 14.0 oz. 62SWG/A

Application #2; Elevate (fenhexamid, 17 - See restrictions) at 1.1 to 1.5 lb 50WDG/A, or Pristine (pyraclostrobin + boscalid, 11 + 7) at 18.5 to 23.0. 38WG/A

Application #3: captan (M3) at 4.0 lb 50WP/A plus Topside M (thiophanate-methyl, 1) at 1.0 lb 70WP or Switch (cyprodinil, 9) at 11.0 to 14.0 oz. 62SWG/A

For subsequent applications, alternate: Captan (M3) at 4.0 lb 50WP/A, or Captivate (captan + fenhexamid, M3 + 17) at 3.5 to 5.25 lb 68WDG/A, or Switch (cyprodinil, 9) at 11.0 to 14.0 oz. 62SWG/A

See Strawberry on page 5
Vegetable Disease of the Week

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology

Disease Briefs

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology

Cucurbit downy mildew has been reported as far north as South Carolina on acorn and yellow summer squash. To follow the progress of cucurbit downy mildew please visit NCSU’s cucurbit downy mildew forecasting website at http://cdm.ipmpipe.org.

There have been no new reports of Late blight outbreaks in the last week.

Strawberry from page 4

or Pristine (pyraclostrobin + boscalid, 11 +7) at 18.5 to 23.0 oz 38 WG/A, or Thiram (M3) at 4.0 to 5.0 lb 65WSB/A.

Tomato – Bacterial spot and speck – Tomato transplants with suspected symptoms can be treated with streptomycin (Agri-Mycin 17, Agri-Strep, 25) at 1 lb/100 gallons, or 1.25 teaspoon per gallon every 4 to 5 days prior to transplanting. Additionally, Kocide 3000 (copper hydroxide, FRAC code M1) has a greenhouse label for speck and spot control in the greenhouse. Apply ½ to 1.5 TBSP per 1000 sq ft. every 5 to 10 days. Remember, phytoxicity is an important issue when apply copper in enclosed structures, see label for cautions, restrictions and liabilities. After transplanting, apply Actigard at 0.33 oz 50WG/A (see label for use), or fixed copper (M1) at 1 lb a.i./A plus a mancozeb (Dithane, Manzate, Penncozeb, M3) at 1.5 lb 75DF or OLF, or ManKocide (M1 + M3) at 2.5 to 5.0 lb 61WP/A on a 7 day schedule.

Food Safety Series:

Updates on FSMA and PSA

Wesley Kline, Ph.D., Cumberland County Agricultural Agent

Food safety issues will be moving very rapidly over the next year. To try and keep everyone abreast of the latest developments we will be putting articles in the weekly Plant and Pest and on the website at http://njveg.rutgers.edu under the food safety button. The vegetable working group is launching a blog where food safety information will be posted as it becomes available.

Food Safety Modernization Act

The Food and Drug Administration has revamped their website to better address the implementation of the new act. There is a wealth of information including videos, webinars, meeting dates, public hearings and workshops about the new law. A full text of the law can be downloaded and there is a series of frequently asked questions posted. They also have initiated sending email updates anytime FDA posts new information about the law. Go to http://www.fda.gov/Food/FoodSafety/FSMA to sign up or review the information available.

Produce Safety Alliance Recruits Members for Working Committees, Launches Website

The Produce Safety Alliance (PSA) announced the launch of its website (www.producesafetyalliance.cornell.edu) and issued a call for farmers, researchers, state officials, produce industry experts and others interested in produce safety to join an Alliance working committee. The committee members will assist in the development of a national Good Agricultural Practices (GAP’s) education curriculum focused on understanding and implementing fresh fruit and vegetable food safety practices.

The Alliance is a broad-based partnership charged with developing a national education and training program for farmers, packers, and regulatory personnel of fresh produce in anticipation of a new produce safety rule from the U.S. Food and Drug Administration (FDA). It is housed at Cornell University’s National GAPs Program and is funded by the U.S. Department of Agriculture (USDA) and the FDA.

The Alliance has created ten working committees, each focused on a specific aspect of produce safety, ranging from production and post-harvest handling issues related to risk assessment and preventive practices through food safety plan writing to certification-related activities.

Grower and industry input is critical for the Alliance. The goal is to develop additional training materials to help growers comply with the Food Safety Mod-
Rutgers NJAES Vegetable Working Group announces their new Vegetable Crops Agriculture Update blog at http://jerseyvegcropsagupdates.blogspot.com/ is online and ready for the 2011 season.

Management decisions are often made by answering a series of ‘what if’ questions. Here are a couple to think about:

What if you knew each morning what pests were being found the day before in your area? Would you be able to make better decisions about what to put in the spray tank that morning?

What if you could quickly check a web site to see the current weather, a calendar of upcoming grower meetings, links to all Rutgers vegetable production resources in one spot? Would that help your daily routines?

The new Rutgers Vegetable Crops Agriculture Update blog allows you to do just that. Check the site to get our daily observations from the field and around the industry. Subscribe to the daily feed and each morning that there is a new post, headlines will be emailed to you early enough to change plans if necessary. Need more details and the links will take you to the full story.

The benefit of the information age for your business is having the best available resources at your fingertips to help you plan your day and make decisions. The Rutgers Vegetable Crops Agriculture Update blog will bring you the most up-to-date local observations from your county agricultural agents, state vegetable specialists and our IPM program coordinators.

Go to http://jerseyvegcropsagupdates.blogspot.com/ now to check out this new resource, and click on the subscribe button in the left col-
Soil Compaction Risk Greater with Wet Soils
Eric Oesterling, Agricultural Educator, Penn State Cooperative Extension

Reprinted from The Vegetable & Small Fruit Gazette, April 2011, Volume 15, No. 4, Penn State Cooperative Extension

Cool, wet spring weather has given us few good days to do field work, increasing temptation to work soils when they are still too wet. Resist that temptation if at all possible. Our soils are more susceptible to compaction than most. Working when soils are too wet can cause surface compaction in the topsoil layer that lasts through the current growing season, and deeper subsurface compaction that lasts for many years.

An ideal soil volume for crop production contains about 25 percent water and 25 percent air by volume. The air and water fill the pore spaces between and among actual soil particles and aggregates. The remaining 50 percent of the volume consists of mineral soil particles and organic matter. Soil compaction reduces the pore spaces in that soil volume. Tillage and wheel traffic that reduces pore space results in a dense soil with poor internal drainage and reduced aeration. Plant roots don’t grow well in dense soil. Inadequate moisture and nutrients reach the plant, and yield is reduced. Generally, the higher the clay content of a soil, the more compaction reduces the yield.

Research in the Midwest has shown that surface compaction can be alleviated by tillage that goes deeper than the area of compaction. However deeper subsurface compaction is relatively permanent. Tire inflation pressure has the biggest impact on surface compaction. Subsoil compaction is due to axle load. Axle loads should be limited to less than 6000 pounds per axle. Our friends in dairy and field crop production generally use bigger, heavier equipment such as manure spreaders, grain wagons and combines that can easily go over those axle limits. But even in vegetable growing equipment used today is larger than it was years ago. Lime trucks, and other equipment can push or exceed those limits. 70% of surface compaction occurs on the first pass over the field so as much as possible it is better to run in the same track to minimize compacted areas.

The only real solution is to avoid, as much as possible, field practices that cause compaction. Do not travel on wet soil unless it is absolutely necessary to do so. Try to avoid excessive axle loads, which cause deep compaction. Eliminate unnecessary tillage operations. Keep tire pressures on the low end of the recommended range. ❏

Weekly Weather Summary
Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much above normal, averaging 64 degrees north, 63 degrees central, and 64 degrees south. Extremes were 90 degrees at Canoe Brook on the 27th, and 39 degrees at numerous locations on the 1st. Weekly rainfall averaged 0.70 inches north, 0.54 inches central, and 0.33 inches south. The heaviest 24 hour total reported was 0.75 inches at Long Branch on the 28th to 29th. Estimated soil moisture, in percent of field capacity, this past week averaged 96 percent north, 92 percent central and 80 percent south. Four inch soil temperatures averaged 62 degrees north, 62 degrees central and 64 degrees south.

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WES KLINE -- GDD BASE 40 PINEY HOLLOW LAST WEEK 131 (ENDING 4/25/11) THIS WEEK 182 (Ending 5/2/11)
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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is responsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCE in your County.

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For back issues of the Plant & Pest Advisory: www.rce.rutgers.edu/pubs/plantandpestadvisory