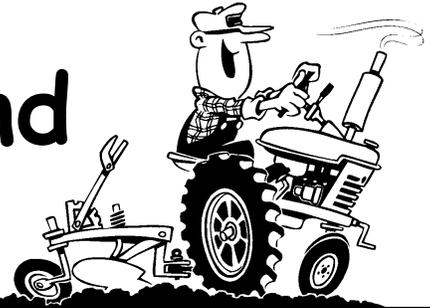


# Cultivating Cumberland

December - 2016 VOL. 21, ISSUE 12



## Inside this issue:

Newsletter Renewal	1 & 5
Center for Product Safety Research Report	2-4
Dickeys Best Management Practices	4-5
New Rutgers Fact Sheets	6
"How To Comply" WPS Manual	6
Chlorpyrifos Comment Period	7
NJ Dept. of Agriculture Change of Address	7
Agricultural History	8
Calendar of Important Events	9-10
Regularly Scheduled Meetings	11
Website information	12

### Attachments:

Food Safety Workshop—Feb. 9th  
OSHA Hazard Bulletin: Tree  
Care Work  
The Soil Profile  
NJ Agriculture & Water Use

## Cultivating Cumberland Renewal

If you wish to continue receiving "Cultivating Cumberland" and other educational mailings from our office, now is the time to renew your subscription.

If you are not already receiving the newsletter via email, please consider doing so. The email comes with all the same information and in full color. If you are already receiving the newsletter via email, thank you for helping us go green.

Reactivation forms (necessary for non-email accounts only) are due back to our office no later than February 15th, 2017. We will begin using the updated mailing list for the March 2017 issue.

You can reactivate your subscription to "Cultivating Cumberland" in one of the following ways:

- Call Tammy at 856-451-2800 x1
- Email: [tammyco@co.cumberland.nj.us](mailto:tammyco@co.cumberland.nj.us)
- Fax the form back to 856-451-4206, or
- Return the form by mail.

Don't miss out on all the up-to-date information. Be sure to renew your subscription to "Cultivating Cumberland" by February 15th. If you have any questions, please feel free to contact Tammy at the Extension Office at 856-451-2800 x1 for assistance.

*Rutgers Cooperative Extension 100 Years of Service in Cumberland County*

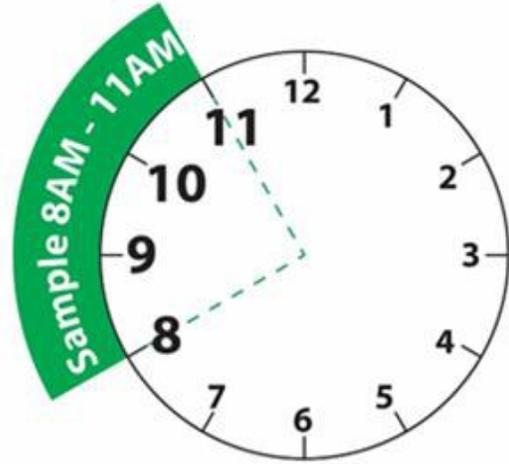
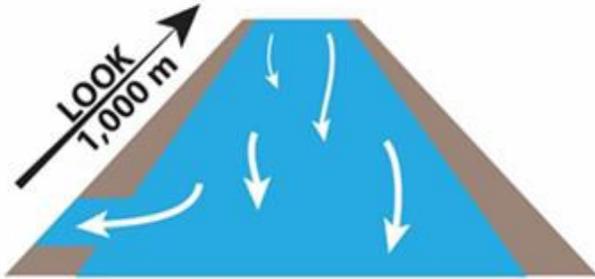
## Center For Product Safety Research Report

This is the second and final report from the seventh annual CPS Research Symposium which was held in Seattle, WA on June 28-29, 2016. As in years past, the produce safety research community came together to share the latest results from CPS-funded programs and to discuss how the data can be used to build risk and science-based food safety programs for produce companies all along the supply chain. The interpretation of food safety research results and application to individual companies is most appropriately the undertaking of those that reside within those specific operations. However, we highlight these key learnings from the CPS Symposium to create awareness and stimulate thought. For more information please contact Bonnie Fernandez-Fenaroli, Executive Director, The Center For Produce Safety, at: [Bonnie@centerforproducesafety.org](mailto:Bonnie@centerforproducesafety.org) or call (530) 554-9761.

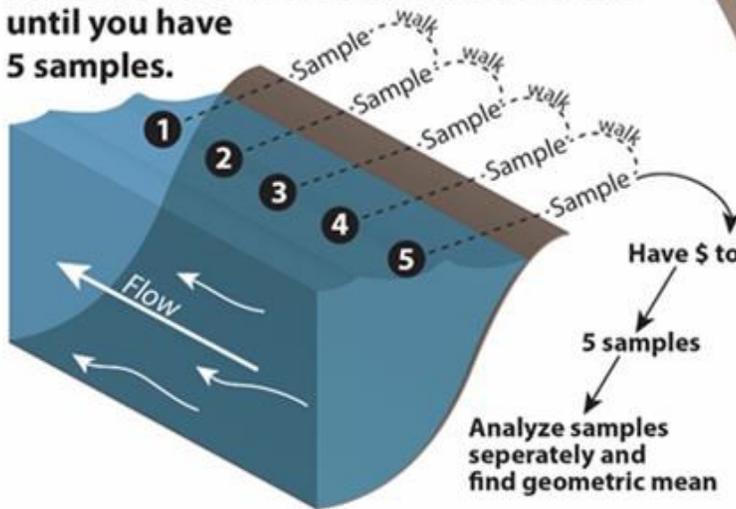
**It is important to sample irrigation water sources correctly.** That certainly sounds logical, but in recent years a number of questions have been raised about how to sample various irrigation water sources when testing microbial quality. Previously, we have learned from work by Vellidis et al (University of Georgia) working on ponds in the Suwanee River region about the [importance of not stirring the pond](#) bottom and that sampling safely from the edge of the pond is comparable to sampling in the middle of the pond. At this year's Symposium, we heard Verhougstraete (University of Arizona) conclude that [it was appropriate to sample irrigation canals anywhere that provided safe access](#). This builds upon previous reports from Rock (University of Arizona) at the 2015 Symposium where her results also [cautioned against stirring up the silt that might reside in the bottom of irrigation canals](#). Verhougstraete also reported that time of day matters when taking water samples; higher levels are found before noon, i.e. Perhaps before the UV of the sun has an opportunity to kill bacteria. He also found that taking five samples and making a composite yielded comparable results to doing five separate tests and calculating a geometric mean. For some this might be an option to save resources in certain irrigation water testing scenarios. Kahler (CDC) provided data that showed that dead end ultra-filtration where large volumes of water can be filtered and concentrated into small volumes has value for detecting low level contamination of Salmonella in irrigation ponds. This certainly supports previous reports where increased sample volumes provide better opportunities of detecting pathogens. Lastly, when samples that exceed compliance values are found, Verhougstraete's data points to the importance of inspecting the canal system 1,000 meters upstream to look for possible sources of contamination. These results all point to the importance of sampling correctly when characterizing the quality of irrigation water. Sampling early in the day and collecting larger sample volumes provides a grower with the best chance of finding a potential contamination problem and affords them the opportunity to make early, proactive decisions to reduce contamination risks. The data also point to the produce safety axiom of knowing your irrigation sources and delivery systems and inspecting them frequently during crop production.

All Photo Rights:  
Dr. Marc Verhougstraete University of Arizona

Look upstream 1,000 m for contamination from withdraw canal.



Take a water sample and walk upstream until you have 5 samples.



Safely take water samples anywhere in the canal stream



Have \$ to analyze:

5 samples

<5 samples

Analyze samples separately and find geometric mean

Mix samples and analyze mixture

**Irrigation water sources can be treated with disinfectants, but...** If a grower finds an irrigation water source that is out of compliance, it would be desirable to be able to treat the water to mitigate the problem. CPS has previously funded work by Kniel (University of Delaware) to explore the use of sand filters enhanced with activated iron. At the 2016 Symposium, Gu (Virginia Tech) reported that short treatments with common disinfectants like sodium hypochlorite, chlorine dioxide or peroxy acetic acid (PAA) may not be sufficient to eliminate human pathogens from irrigation water. The contact time and concentration of disinfectant is heavily influenced by the organic matter in the irrigation water. Buchanan (University of Tennessee) observed the same relationship for time and concentration and the impact organic matter in pond water can have on any treatments. One can reduce the contact time needed to kill pathogens if the disinfectant concentration is high enough

and the water has low levels of organic matter, but ideal conditions are not commonly found. He also cautioned that high concentrations of disinfectants may have negative consequences for soil health. Similarly, low concentrations of disinfectants might be employed but obtaining sufficient contact time with the water is difficult owing to flow rates used in many irrigation systems. Lastly, Buchanan warned that irrigation pipes and delivery systems can become sources of contamination if they are not properly drained and maintained.

These results again point out the importance of knowing your irrigation water sources and water delivery systems and inspecting them frequently for potential contamination risks. Preventing contamination from occurring, though difficult in some instances, is preferable to trying to mitigate contamination once it has occurred. It is also important to note, that FDA has recognized in the produce rule that different irrigation water systems pose different levels of risk (e.g. overhead spray irrigation where the water contacts the edible portion of the plant versus drip irrigation that delivers water directly to the root system) and that FDA recognizes that pathogens, if present, die off owing to UV from the sun and the harsh conditions encountered in the typical production environment.

### **Best Management Practices for Soft Rot Associated with *Dickeya* in Potato Production Fields in the Northeast**

Potato seed tubers harboring *Dickeya dianthicola* are the only confirmed source of this pathogen. It does not appear to be able to survive in soil (including in crop debris) from one growing season to the next. Consequently, rotating with a non-susceptible crop is not a necessary component of the management program. Best management practices listed below are encouraged to minimize potential losses from *Dickeya*.

Note: While *Dickeya* is an emerging pathogen and of greatest concern, bacteria in the genus *Pectobacterium* continue to be responsible for soft rot disease in eastern and midwestern states and are the most common soft rot pathogen in some areas.

1. Select certified seed with negligible potential to be contaminated with *Dickeya*. This is best determined by talking with the seed grower about past occurrence on the farm and what is being done to manage it. There are growers who have not had *Dickeya* develop from their seed.
  - a. Select seed from farms where the pathogen has not been detected and seed marketed in previous years was not associated with *Dickeya* developing where the seed was planted. Check Certificates before purchase to determine if the seed was increased in previous years on a farm where *Dickeya* has been detected and so is at risk for being contaminated.
  - b. Select seed from farms where zero tolerance is being implemented.
  - c. Select seed with zero blackleg levels reported on the North American Seed Potato Health Certificates or the Winter Grow Out Test results for presence of *Dickeya* in ANY seed lot from ANY source. Seed lots with field readings of blackleg present should have reports that suspect plant samples were taken for testing and found to be *Dickeya* free. Check certificates before purchase and require a copy be provided for your records.

Continued on page 5

Continued from page 4

- d. Select seed that tested negative for *Dickeya*. Note that not detecting a pathogen in a sample of seed does not mean the pathogen is not present in the seedlot.
  - e. Ask for 'references' to contact: potato growers who purchased their seed in 2016.
  - f. Avoid seed lots that tested positive for *Dickeya* in previous years.
  - g. Avoid seed if its Certificate is unavailable. All certified seed has a Certificate.
  - h. Avoid seed from fields where symptoms of *Dickeya* were observed, even if affected plants were rogued out.
2. Request from supplier (directly from grower or broker) PCR testing for *Dickeya dianthicola* using an independent laboratory.
  3. It is recommended that each truckload brought to a farm operation be sampled and re-tested for *Dickeya* once delivered. All results should be reported to your State Department of Agriculture or Potato Growers Association.
  4. All equipment during seed piece cutting should be disinfested on a regular basis (at least daily), and also between lot numbers.
  5. While it is recommended to rotate where potatoes are grown to manage most pathogens that can survive in unharvested tubers, this practice is not considered important for *Dickeya* because this pathogen does not readily spread in fields (thus a few tubers with *Dickeya* will not result in significant disease outbreak as can occur with late blight) and infected tubers are likely to rot while in soil.
  6. Inspect fields for symptoms regularly, starting when skips and affected plants are readily visible. Examine the crop for unevenness (erratic growth) and plants that are unthrifty. *Dickeya* can be present in a plant affecting growth but not causing its typical blackleg symptom. Growers are encouraged to submit suspect samples for testing promptly to their local extension office in order to confirm *Dickeya* is the cause and to contribute to knowledge about *Dickeya* occurrence, and also to share their observations of *Dickeya* with the seed producer.
  7. Avoid excess irrigation that results in standing water as *Dickeya* can move in this water. Note that surface irrigation water is not considered to be a possible source of *Dickeya*.
  8. Do not apply copper or other fungicide for *Dickeya*. They are ineffective being unable to reach the pathogen, which is inside stems.
  9. All growers are requested to share information about *Dickeya* occurrence and absence in their production fields. This information is needed to improve understanding about this disease. Include variety, lot number (North American Seed Certificate), field location, and testing results.
  10. *Dickeya* has not been observed to continue developing in storage, which is as expected considering high temperatures are favorable, thus there are no management steps to implement after harvest for table-stock potatoes. However, it is prudent to make sure storages and pile temperatures remain cool, also reduce condensation and encourage airflow and exchange.

Prepared by Meg McGrath and Andy Wyenandt with assistance from Steve Johnson, Keith Perry, Kate Everts, Beth Gugino, and Nate Kleczewski.

## New Rutgers Fact Sheets

The following facts sheets are now available on the NJAES publications website:  
[www.njaes.rutgers.edu/pubs](http://www.njaes.rutgers.edu/pubs):

- |        |  |
|--------|--|
| FS1259 | Ultra-Niche Crop Series: Plasticulture Strawberries                                    |
| FS1258 | Ultra-Niche Crop Series: Plasticulture Strawberries Postharvest Handling & Food Safety |
| FS1262 | Measuring Temperature, Pulse & Respiration (TPR): What's Normal for my Horse?          |

## Pesticide Worker Protection Standard "How to Comply" Manual

The EPA in conjunction with the Pesticide Educational Resources Collaborative (PERC) is making available a guide to help users of agricultural pesticides comply with the requirements of the 2015 revised federal Worker Protection Standard. You should read this manual if you employ agricultural workers or handlers, are involved in the production of agricultural plants as an owner/manager of an agricultural establishment or a commercial (for-hire) pesticide handling establishment, or work as a crop advisor.

The "How To Comply" manual includes:

- Details to help determine if the WPS requirements apply to you.
- Information on how to comply with the WPS requirements.
- Quick Reference Guide
- New or revised definitions that may affect your WPS responsibilities.
- Explanations to help you better understand the WPS requirements and how they may apply to you.

This updated 2016 WPS "How to Comply" Manual supersedes the 2005 version. Changes to the standard have made the 2005 version obsolete.

To download the manual or view it on-line, visit: <https://www.epa.gov/sites/production/files/2016-10/documents/htcmanual-oct16>

## Comment Period for Chlorpyrifos (Lorsban, Warhawk, & Yuma)

In 2007, after the EPA completed its Re-registration of chlorpyrifos under the Food Quality Protection Act (FQPA), the Natural Resources Defense Council (NRDC) and Pesticide Action Network North America (PANNA) petitioned the EPA to revoke all tolerances and cancel all registrations of chlorpyrifos.

In response, EPA initiated a Registration Review of the molecule (well over a decade ahead of schedule). Not satisfied with the time it was taking EPA to complete this rigorous scientific reassessment, NRDC and PANNA in 2010 sought an order from the Ninth Circuit Court of Appeals requiring EPA to promptly act on the petition.

The court eventually agreed with the petitioners and ordered EPA to make a final decision. In October 2015, despite not having completed its scientific review, EPA sought comments on a proposal to revoke all tolerances. The court later ordered EPA to take final action on the petition by March 31, 2017.

EPA has opened a 60-day public comment period (Docket EPA-HQ-OPP-2015-0653; closing date January 17, 2017).

The public comment period for this NODA will likely be the last opportunity for stakeholders to weigh in on the cost-benefit analysis by expressing the critical need for chlorpyrifos, and to call for the EPA to rely on sound and transparent science and a reliable regulatory process critical need for chlorpyrifos.

Dow AgroScience has put together a website with more information that may be of interest:

<http://www.dowagro.com/en-US/usag/Chlorpyrifos%20Petition#petition>

### NJ Department of Agriculture's New Address

The local office for the NJ Department of Agriculture has moved. Previously located at: 40 E. Broad Street, Bridgeton, NJ; they are now located at 275 N. Delsea Drive, Vineland, NJ.

The new telephone number is 856-839-3388.

## Cumberland County Agricultural History

### Land Use (Zoning, State/Federal Regulation, Reclamation Planning):

Most land in agriculture in Cumberland County is not currently preserved. As of 2012, 147 farms covering 16,872 acres had been preserved out of the total 583 farms covering 64,526 acres. This accounts for about 25 percent of all farms and farmland in the county.

This statistic raises issues of whether the remaining 75 percent of farms and farmland could be purchased and developed as New Jersey moves into the future. Farmland preservation gained significance throughout the state in the 1980s and 1990s when development of farmland for, primarily, housing saw its greatest most-recent demand.

The county's historic and cultural attachment to agriculture will likely help mitigate the amount of land that could be sold for development, as multi-generational farms are more common in the county than elsewhere in New Jersey. However, significant additional acreage could be lost to either saltwater intrusion, lack of economic viability, increased regulatory hurdles or a housing or commercial development boom similar to that of the '80s and '90s is experienced.

### State of the Resource:

Sandy soils, level topography, optimum climate and ample rainfall, along with available fresh well water for irrigation, contribute to Cumberland County's concentrated vegetable and nursery production.

Modern agricultural practices such as crop rotation, the use of cover crops and water and soil conservation methods are helping to preserve the resources necessary to sustain agriculture into the future.

Cumberland County also has a highly active agricultural education community with FFA and 4-H programs in more abundance than other New Jersey counties and programs within the schools geared toward training the next generation of agricultural professionals.

One of the biggest concerns on the horizon is the potential for saltwater intrusion from a rising sea level and the forecast higher potential for storms that bring a storm surge up the Delaware Bay.

## Calendar of Important Events

📅 Indicates the newly added event since last calendar

### December 2016

#### **December 5-6**

**Practical Food Microbiology**, Rutgers Continuing Education, New Brunswick, NJ. \$795 by 11/21; \$825 after. For more information call 848-932-9271 or visit: [www.cpe.rutgers.edu](http://www.cpe.rutgers.edu)

#### **December 6-8**

**Great Lakes Fruit, Vegetable and Farm Market Expo**, Devos Place Conference Center, Grand Rapids, Michigan. For more information call 616-794-0492 or visit: [www.glexpo.com](http://www.glexpo.com)

#### **December 7-8**

**Irrigation Show**, Las Vegas Convention Center, Las Vegas, Nevada. For more information visit: [www.irrigation.org](http://www.irrigation.org)

#### 📅 **December 14-15**

**Food Safety Modernization Act—Produce Rule Training & Plan Writing for Beginners**, Rutgers Cooperative Extension Cumberland County, 291 Morton Avenue, Rosenhayn, NJ; 9 am-4 pm; \$50/person Day 1 and \$25/person Day 2 (optional). Cost includes lunch and materials. To register call Tammy at 856-451-2800 x1.

#### 📅 **December 14**

**Creating a Farm Loan Package Webinar**, Sponsored by the Mid-Atlantic Women in Agriculture. To register visit: <http://www.eventbrite.com/e/Wednesday-webinars-registration-11452674257>

### January 2017

#### 📅 **January 3-5**

**Northeastern Plant, Pest & Soil Conference**, Sheraton Society Hills Hotel, One Dock Street, Philadelphia, PA. For more information visit: <http://www.newss.org/annualmeeting.php>

#### 📅 **January 9-12**

**Delaware "Ag Week"**, Delaware State Fairgrounds, Harrington, DE. For more information visit: <http://sites.udel.edu/delawareagweek/> or contact Delaware Cooperative Extension at 302-856-2585 x540.

#### 📅 **January 31**

**Ultra Niche Crops: High Tunnel Winter Lettuce**, Rutgers Cooperative Extension Cape May County; Rutgers Cooperative Extension Somerset County and Rutgers EcoComplex. 5:30 p.m.-8:00 p.m.; \$20/person. Deadline to register is January 27, 2017. For more information contact Jenny Carleo, Ag Agent at 609-465-5115 or email Jennifer Matthews at: [jmatthews@aesop.rutgers.edu](mailto:jmatthews@aesop.rutgers.edu)

## **February 2017**

### **📅 February 8-9**

**2017 Mid-Atlantic Women in Agriculture Regional Conference**, Dover Downs Hotel & Conference Center, Dover, DE.

### **📅 February 9**

**Food Safety Modernization Act-Produce Rule Training**, Held during the 2017 NJ Agricultural Convention & Trade Show, Harrah's Resort, 777 Harrah's Boulevard, Atlantic City, NJ. 9 am—4 pm; Cost \$35/person prepaid/at the door. Cost includes materials. Lunch not included. To register call Tammy at 856-451-2800 x1.

### **📅 February 22-23**

**Food Safety Modernization Act-Produce Rule Training & Plan Writing for Beginners**, Mercer County Cooperative Extension, 930 Spruce St., Trenton, NJ; 9 am-4 pm; \$50/person Day 1 and \$25/person Day 2 (optional). Cost includes lunch and materials. To register call 856-451-2800 x1.

### **📅 February 24**

**Central Jersey Vegetable Grower's Meeting**, Ag Building, 4000 Kozloski Road, Freehold, NJ. For more information call Joanne: 732-431-7260

## **March 2017**

### **📅 March 1-2**

**Food Safety Modernization Act-Produce Rule Training & Third Party Audit Plan Writing**, Cumberland County Extension Center, 291 Morton Ave., Rosenhayn; 9 am-4 pm; \$50/person Day 1 and \$25/person Day 2 (optional). Cost includes lunch and materials. To register call Tammy 856-451-2800 x1.

### **📅 March 7**

**Ultra-Niche Crops: Specialty Peppers**, RCE Cape May County, Somerset County and Rutgers EcoComplex. \$20; 5:30-8:00 p.m.. Deadline to register is March 3, 2017. For more information call Jenny Carleo, Ag Agent at 609-465-5115 or email Jennifer Matthews at: [jmatthews@aesop.rutgers.edu](mailto:jmatthews@aesop.rutgers.edu)

### **📅 March 8-9**

**Food Safety Modernization Act-Produce Rule Training for Blueberry Growers & Third Party Audit Plan Writing**, Marucci Center for Blueberry & Cranberry Research & Extension; 125A Lake Oswego Rd., Chatsworth, NJ; 9am-4pm; \$50/person Day 1 and \$25/person Day 2 (optional). Cost includes lunch and materials. To register call Tammy 856-451-2800 x1.

### **📅 March 22-23**

**Food Safety Modernization Act-Produce Rule Training & Plan Writing for Beginners**, Hunterdon County Extension, 314 State Route 12, Bldg. 2, Flemington, NJ; 9am-4pm; \$50/person Day 1 and \$25/person Day 2 (optional). To register call Tammy 856-451-2800 x1. NOTE: Tentative location.

## REGULARLY SCHEDULED MEETINGS

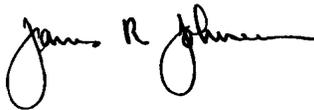
✓ Indicates meeting will be held at RCE of Cumberland County

<p>✓</p> <p><b>Pesticide Certification Exam Schedule—Cumberland County</b> 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn &amp; Carmel)</p> <p><u>2016</u> Feb 16    Mar 16 Apr 20    May 18 Oct 19</p> <p><b>To Register call 609-984-6614 For directions call 856-451-2800</b> *****</p>	<p>✓</p> <p><b>Cumberland County Agriculture Development Board</b> Soil Conservation Office 1516 Highway 77 Deerfield Street, NJ 08332</p> <p><u>2016</u> Dec 15</p> <p><b>Reg. Meetings start at 7 p.m. Information call 856-453-2211</b> *****</p>	<p>✓</p> <p><b>Cumberland County Board Of Agriculture</b> 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn &amp; Carmel) 7 pm meetings</p> <p><u>2016</u> Nov 17    Dec 15</p> <p><b>For info call Hillary Barile, President 856-453-1192</b> *****</p>
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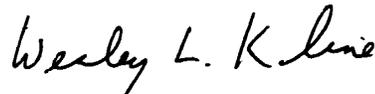
**Cumberland County Improvement Authority (CCIA)  
Pesticide Container Recycling  
9:00 a.m. to 12 Noon**  
Cumberland County Solid Waste Complex  
169 Jesse's Bridge Rd. (located off Route 55 Exit 29)  
Deerfield Township, New Jersey  
Questions? Call Division of Ag & Natural Resources, NJ Dept. of Ag 609-292-5532

2017 Dates will be published when received

Sincerely,



James R. Johnson  
Agricultural Agent  
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Wesley L. Kline, Ph.D.  
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**Pesticide User Responsibility:** Use pesticides safely and follow instructions on labels. The user is responsible for the proper use of pesticides, residues on crops, storage and disposal, as well as damages caused by drift.

**Use of Trade Names:** Trade names are used in this publication with the understanding that no discrimination is intended and no endorsement is implied. In some instances the compound may be sold under different trade names, which may vary as to label.

Have you visited the Cumberland County website for the Present and/or past issues of "Cultivating Cumberland"? It's a great resource for information and dates.....

<http://Cumberland.njaes.rutgers.edu/>

Public Notification and Non-discrimination Statement

Rutgers Cooperative Extension is an equal opportunity program provider and employer. Contact your local Extension Office for information regarding special needs or accommodations. Contact the State Extension Director's Office if you have concerns related to discrimination, 848-932-3584.

*Rutgers Cooperative Extension 100 Years of Service in Cumberland County*

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Cooperative Extension of Cumberland County  
Extension Education Center  
291 Morton Avenue  
Millville, NJ 08332-9791

**RUTGERS**  
New Jersey Agricultural  
Experiment Station

## Benefits of Attending the Workshop

Individuals who participate in this course will gain a basic understanding of:

- Microorganisms relevant to produce safety
- Where microorganisms may be found on the farm
- How to identify microbial risks, practices that reduce risks and how to begin implementing produce safety practices on the farm
- Parts of a farm food safety plan and how to begin writing one
- Requirements in the FSMA Produce Safety Rule and how to meet them
- Fulfills the requirement for at least one supervisor from a farm to complete food safety training at least equivalent to the standardized curriculum recognized by the FDA

### Details

**Place:** Harrah's Resort  
Atlantic City, NJ

**Cost:** \$35/person

Pre-register or pay at the door

**Checks:** Payable to **CC Board of Ag Research Account**

**RUTGERS**

New Jersey Agricultural  
Experiment Station

## Food Safety Modernization Act - Produce Rule Training

**February 9, 2017**

Held During the  
2017 NJ Agricultural  
Convention  
& Trade Show  
Harrah's Resort  
Atlantic City, NJ

**\$35/person**

**9am – 4:30pm**

**Lunch is on your own**

**To register, fill out and mail the registration form in this brochure with payment or payment accepted at the door**

## Who Should Attend:

- Fruit Growers
- Vegetable Growers
- Others interested in produce safety, GAP's, co-management and FSMA

## What to Expect at the Produce Safety Alliance Grower Training:

Trainers will spend approximately seven hours of instruction time to cover the following content:

- Introduction to Produce Safety
- Worker Health, Hygiene and Training
- Soil Amendments
- Wildlife, Domesticated Animals and Land Use
- Agricultural Water (Part I: Production Water; Part II: Postharvest Water)
- Postharvest Handling and Sanitation
- How to Develop a Farm Food Safety Plan



## Registration Form

**Please send with payment**

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Name (attach additional sheet if necessary)

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Email address

---

Mailing address

---

Telephone number

Mail to:

Food Safety Certification Workshop  
(February 9, 2017)  
Rutgers Cooperative Extension  
291 Morton Avenue  
Millville, NJ 08332

ATTENTION: Tammy

Make checks payable to: **CC Board of Ag  
Research Account**

*Cooperating Agencies:* Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.

## Tree Care Work: Falls and Falling Object Hazards

There are many serious hazards in tree care work. This Hazard Bulletin focuses on the hazards from falls and falling objects which can result in serious injuries or death. These hazards also account for a high proportion of the tree care fatalities investigated by Federal OSHA.

### Fatal Incidents: Two Examples

The following fatal incident descriptions involve the serious hazards of falls and falling objects:

#### Falling Object Incident

A tree care worker was dragging trimmed branches to a mobile wood chipper. A second worker, a trimmer, was working from a mobile bucket truck. The trimmer was piecing out a large maple tree scheduled for removal from the rear of a residence. The trimmer cut a piece of a limb that was approximately one foot in diameter and 20 inches long. When the limb fell, it struck the tree care worker on the head, killing him. An investigation of this incident determined that ground personnel should not have been in the tree-trimming area, or “drop zone”, while the trimmer was performing overhead work. The employer was required to establish a system of verbal and visual communications that the trimmer could use to inform ground personnel to stand clear when an overhead hazard existed.

#### Fall Incident

A worker climbed a large hickory tree to remove the top of the tree. After he cut one section off the top of the tree and was roping down a second section, the trunk of the tree he was working from snapped in half. This caused the worker and the entire top of the tree to fall approximately 65 feet to the ground, killing the worker. The employer could have prevented this incident by performing a



Photo courtesy of Altec

preliminary examination of the tree before starting work. A thorough preliminary examination would have shown that the tree could not support the forces resulting from rigging and roping down cut tree sections.

### Prevention

Before beginning any tree care operation, employers need to:

- **Assess the work site for fall and falling object hazards.** Assess the sloped ground where ladders or equipment will be used to prevent falls from equipment overturns and ladder slippage; nearby overhead objects or structures; and weather-related hazards.
- **Have a qualified arborist survey the worksite and identify the types of trees involved and possible hazards related to tree structure.** The qualified arborist would identify fall hazards and

falling object hazards due to tree condition. The American National Standard Institute's (ANSI) Z133 consensus standard on tree care work defines "qualified arborist."

- **Determine if rigging is necessary and, if so, that workers can use it safely.** This determination helps prevent sections of the tree from falling while performing tree care work.
- **Determine if workers will need to climb or use aerial lifts.** In making this determination, ensure that:
  - o Ladders are:
    - Well maintained and not defective, such as having missing or broken parts;
    - Kept at least 10 feet away from power lines and other electric equipment. For lines and equipment over 50 kV, the distance should be 10 feet plus 4 inches for every 10 kV over 50 kV.†
    - Inspected before each use, and remove damaged or defective ladders;
    - Secured to avoid slippage; and
    - Used according to the manufacturer's instructions.
  - o Aerial lifts are:
    - Maintained and properly set up for use;
    - Used according to the manufacturer's instructions;
    - Not used as cranes to lift or hoist tree parts or material unless designed for that purpose;
    - Only used with fall protection equipment including tie-off; and
    - Kept at least 10 feet away from power lines and other electric equipment. For lines and equipment over 50 kV, the distance should be 10 feet plus 4 inches for every 10 kV over 50 kV.†
  - o Workers who climb trees are trained on:
    - Climbing techniques;
    - Using climbing spurs with gaffs that are compatible with the tree they will climb;

- Using a second means of fall protection such as a work-positioning lanyard or a second climbing line, in addition to using an arborist climbing line;
  - Lifting and lowering hand tools and equipment; and
  - Carrying only hand tools and equipment that are necessary for climbing.
- **Identify and provide without cost properly fitting personal protective equipment to protect workers from fall and overhead falling object hazards, and ensure that the workers use the equipment and are trained in its proper use.**
  - **Only use climbing equipment approved by the manufacturer for tree care work, including climbing lines, safety lines, personal fall protection equipment, and inspect all equipment for safe operation before starting work; remove damaged, defective, or worn equipment from service.**
  - **Ensure that all workers at a tree care operation are trained in hazard recognition for falls from elevation and falling object hazards, and the use of personal protective equipment, such as hard hats, to protect against injury from overhead falling objects.**
  - **If workers cannot remain at least 10 feet from electric lines to perform tree care operations, contact the utility company to de-energize and ground the lines.†**
  - **Take the following steps to protect workers from falling object hazards:** (1) Establish and mark drop zones with equipment, such as cones, where there is a hazard of objects falling; (2) ensure that all workers receive training on procedures for entering the drop zone; (3) ensure that ground workers maintain a distance away from the tree-felling operations that is at least two times the height of the tree; and (4) when using a rope to fell a tree, workers must be at a distance of at least one-and-a-half times the height of the tree being felled.
  - **Establish a visual or audible communication system between overhead workers and workers on the ground before starting rigging operations for piecing out the tree.** The system must effectively communicate when employees who are beneath overhead tree workers should stand clear of the drop zone, and when it is safe to approach a drop zone. A worker trained in

† This guidance is intended as a general warning for all tree care workers. In situations where employees other than qualified workers, as defined in 29 CFR 1910.269(a)(1)(i)(E)(1), are clearing trees and brush around electrical lines, minimum approach distances are given in 29 CFR 1910.269(r)(1). For further information see the Electric Power eTool at [www.osha.gov/SLTC/etools/electric\\_power/overheadlinework\\_lineclearance.html](http://www.osha.gov/SLTC/etools/electric_power/overheadlinework_lineclearance.html).

emergency procedures needs to be within visual or voice communication with the worker climbing and working in a tree above 12 feet in height.

- **Provide traffic and pedestrian traffic control around the jobsite prior to the start of the tree care operation.**
- **Have emergency procedures in place prior to the start of the tree care operation.** Determine if the worksite location has cellular telephone coverage and verify that every worker knows the address of the worksite in case they need to summon emergency services to the site. Establish a retreat path for ground workers so they can escape from falling trees.

## Additional Resources for Employers and Workers

OSHA's webpage on the Tree Care Industry, at [www.osha.gov/treecare](http://www.osha.gov/treecare), provides many resources on OSHA standards, hazard recognition, safety and health programs, and additional resources.

## Help for Employers

OSHA's On-site Consultation Program offers free and confidential advice to small businesses with fewer than 250 workers at a site (and no more than 500 employees nationwide). This program provides free on-site compliance assistance to help employers identify and correct job hazards as well as improve injury and illness prevention programs. On-site consultation services are separate from enforcement and do not result in penalties or citations. To locate the OSHA consultation office nearest you, visit [www.osha.gov](http://www.osha.gov) or call 1-800-321-OSHA (6742).

OSHA has compliance assistance specialists throughout the nation located in most OSHA offices. Compliance assistance specialists can provide information to employers and workers about OSHA standards, short educational programs on specific hazards or OSHA rights and responsibilities, and information on additional compliance assistance

resources. Contact your local OSHA office for more information by calling 1-800-321-OSHA (6742) or visit OSHA's website at [www.osha.gov](http://www.osha.gov).

## Workers' Rights

Workers have the right to:

- A safe workplace: working conditions that do not pose a risk of serious harm. The law requires employers to provide their employees with working conditions that are free of known dangers. The OSHA law also prohibits employers from retaliating against employees for exercising their rights under the law (including the right to raise a safety or health concern or to report an injury). For more information see [www.whistleblowers.gov](http://www.whistleblowers.gov) or [workers' rights](#).
- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary they can understand) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- Get copies of test results that find and measure hazards.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. When requested, OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation.

## Contact OSHA

For questions or to get information or advice, to report an emergency, report a fatality or catastrophe, order publications, or to file a confidential complaint, contact your nearest OSHA office, visit [www.osha.gov](http://www.osha.gov), or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

*This bulletin is not a standard or regulation, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace. The Occupational Safety and Health Act requires employers to comply with safety and health standards and regulations promulgated by OSHA or by a state with an OSHA-approved state plan. In addition, the Act's General Duty Clause, Section 5(a)(1), requires employers to provide their employees with a workplace free from recognized hazards likely to cause death or serious physical harm.*



# THE SOIL PROFILE

**A newsletter providing  
information on issues  
relating to soils and  
plant nutrition in  
New Jersey**

Volume 23

2016

After several years of growing sunn hemp in rotation with various grain and vegetable crops I will share some observations and experiences in this issue of The Soil Profile newsletter. The field research was conducted at the Rutgers Snyder Research and Extension Farm near Pittstown, NJ and the Rutgers Vegetable Research Farm in East Brunswick, NJ. In addition to the information provided here, a web search for sunn hemp can find several useful publications about growing this cover crop. A web search for “cover crop decision tool” is another useful resource.

## **Agronomics of Sunn Hemp**

- Soil pH range 5.0 to 7.0
- Plant in late spring when soil temperature is about 65F
- Inoculate the seed with the correct strain of Bradyrhizobium for nodulation and N fixation
- Drill seed 0.5 to 1.0 inch deep at rate of 30 to 50 pounds per acre
- Organic growers can purchase certified organic seed of sunn hemp

## **Need Nitrogen? Grow Sunn Hemp Cover Crop**

Sunn Hemp is a fast growing, soil building summer cover crop. Among the many different cover crop choices, sunn hemp is especially good for converting N from the atmosphere into soil fertility. It also builds soil organic matter content and helps control soil erosion. From a seeding in late spring, it can produce a large amount of biomass over the summer growing season. The tall dense growth habit of sunn hemp is very competitive against weeds. It is also reported to suppress parasitic nematodes in soil.



- Sunn hemp should reach 4 feet in 8 weeks and about 7 feet in 12 weeks
- Yellow-orange flowers appear in late summer
- In New Jersey, killing frost prevents seed set; there is no risk of sunn hemp becoming a weed

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- Potential to produce 2.5 tons of biomass and 100 to 140 pounds of nitrogen per acre
- Mowing and tilling the large amount of biomass into the soil can be a challenge

### End of Season Sunn Hemp Management

The huge amount of biomass accumulated by a sunn hemp cover crop by the end of summer can at first appear to be a formidable challenge for mowing or tillage. What has been found to work well at the Rutgers Snyder Research and Extension Farm is to mow the sunn hemp off at about a foot above the ground using a sickle bar mower. The tall green plants falling upon the stubble eventually dry over winter. Once this biomass is dry (or even frozen in winter) it shatters fairly easily by mowing it with a brush hog type of mower. The remaining shredded sunn hemp cover crop residue is easily incorporated with spring tillage.



### Soil Fertility Research with Sunn Hemp

Soil fertility research conducted at Rutgers NJAES over the last two decades was instrumental in adapting the presidedress soil nitrate test (PSNT) to a wide range of crops, especially annual vegetable crops. The procedures for using this soil test and the recommendations for various crops are given in the Rutgers Cooperative Extension fact sheet entitled: Soil Nitrate Testing as a Guide to

Nitrogen Management for Vegetable Crops  
<https://njaes.rutgers.edu/pubs/publication.asp?pid=E285>

Current research with the PSNT soil test is focused on how to adapt its use to additional vegetable crops, and in particular when those crops follow legume cover crops such as sunn hemp.

The main focus of my research with sunn hemp is on its capacity to supply and deliver available N to annual crops in the following growing season. Although sunn hemp fixes a substantial amount of N, it is not easy to predict how much and when this N will become available to subsequent crops. How much N accumulates in the cover crop biomass from biological N fixation depends on many factors. Also, cover crop and soil management practices could influence the rate that this N eventually becomes available for plant uptake.

Causes of this uncertainty may include how many weeks the sunn hemp was allowed to grow to accumulate N, and suitability of weather for the cover crop development. Potentially as much as 140 pounds of N may be fixed by sunn hemp.

Additional uncertainty relates to how rapidly the accumulated N will be converted in the soil to forms easily available to subsequent crops. This may depend on how the cover crop was killed at seasons end and if the cover crop residue was allowed to remain on the soil surface or was it tilled into the soil. Also it may depend on residue particle size and if the residue was shredded.



Although sunn hemp has many leaves which should easily decompose and release available

N, the stems are very thick and woody. At the Rutgers Snyder Research Farm, many months after sunn hemp has been killed by frost, mowed, shredded, and tilled into the soil, much of the stem residue remains visible in the soil. This stem tissue is probably an important factor slowing the release of the N contained in the biomass into the soil pool available N.



As a practical way to manage around these uncertainties, I am using the pre-sidedress soil N test (PSNT). This soil test is being used to measure the nitrate-N concentration in the top 12 inches of soil where sunn hemp cover crops were grown in the previous year. The soil sampling is performed at the specific time when annual crops such as corn or many types of vegetables are already established in the field and are about to go into the rapid N uptake growth phase.

One of the most challenging problems when dealing with on-farm sources of N, from cover crops, crop rotations, compost, or manures, is figuring out when and how much of that N will be available to meet the needs of the next crop. Sure there are estimates given in various look up tables, but they are not reliable. The estimates are subject to all the uncertainties and vulnerabilities of the processes that take place within the nitrogen cycle. While it helps to know and understand the N cycle, one of its most unpredictable features is the influence of weather conditions on the potential for N losses from the soil.

The great value of the PSNT soil test is its effectiveness at making accurate predictions. Its accuracy is related to taking a measure the nitrate-N concentration in the soil right before the most critical demand stage for crop N

uptake. In general, and for most crops, when the PSNT finds 25 ppm nitrate-N in the soil, the field soil is considered to have enough available N to meet the needs of the crop. In such cases no supplemental or sidedress N is recommended. However, when the PSNT finds less than 25 ppm in the soil, some sidedress N fertilizer is usually recommended to ensure an adequate supply of N to the crop. When the PSNT levels are between 20 and 25 ppm, low rates of sidedress N may be recommended and when PSNT levels are very low (<10 ppm) higher application rates of N are recommended.

One of the great benefits of using the PSNT on fields where legume cover crops have been grown is that when this soil test finds more than 25 ppm nitrate-N in the soil, growers can with confidence avoid applying unneeded N fertilizer. On fields without legume cover crops or without recent applications of manures or compost, the PSNT levels are almost always rather low; often they are less than 10 ppm.

In fact, when there is no significant contribution from on-farm sources of N to the soil supply, it is almost always a waste of time and effort to use the PSNT. These low N testing fields can be predicted by the absence of manure application or legumes in the crop rotation. Farmers should instead focus their PSNT soil sampling efforts only on those fields where there is reason to believe that the soil may have a good capacity to supply available N to crops without adding supplemental N fertilizer. Thus, the PSNT is especially useful for classifying fields as adequate or deficient when on-farm sources of N such as cover crops are involved.

At the Rutgers Snyder Farm, on fields where sunn hemp was grown in the previous year, PSNT soil samples collected in early summer have found values of 14, 20, and 24 ppm. Fields not following sunn hemp typically have PSNT values of 10 ppm or less. While sunn hemp appears to be increasing N availability in the soil, the levels are still below the 25 ppm standard, in which case a low application rate of sidedress N may be recommended. But in this particular field where sweet potato is being grown, PSNT levels between 20 to 24 ppm are

probably adequate. (This is because the generally recommended total application of N for sweet potato is 50 to 75 lbs N/acre. And a PSNT of 20 ppm is approximately equivalent to 80 lbs N/acre of available N in the surface 12 inches of soil.)



In bare soil during the summer months, nitrate-N tends to accumulate in soil where no crop is growing to uptake and remove N from the soil. An apparent difference in nitrate-N accumulation was shown for late summer 2016 for a field that had been cover cropped to sunn hemp in 2015. The section of the field planted to sweet potato had a PSNT soil test level of 20 ppm when sampled in mid-June, and only 4 ppm when sampled at the same location in mid-August after the vines had completely covered the soil. However, in an unplanted area of this field the PSNT level 26 ppm.

This soil testing for N shows that the growing sweet potato plants were withdrawing N from the soil but in the unplanted area the nitrate-N levels increased because N was allowed to accumulate. Most interestingly, the results suggest that sunn hemp continues to release available N into the soil during summer months when growing crops have their greatest need for N fertility. Thus, sunn hemp is an effective biological source of sustainably grown N fertilizer.



#### References:

Heckman, J.R. 2003. Soil Nitrate Testing as a Guide to Nitrogen Management for Vegetable

Crops. E285, 6 pp. Web Site:

<http://www.rcrc.rutgers.edu/pubs/publication.asp?pid=E285>

Sunn Hemp: A Cover Crop for Southern and Tropical Farming Systems

[http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs142p2\\_053283.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053283.pdf)

Sunn hemp gains popularity as a stress-tolerant cover crop <https://mosesorganic.org/sunn-hemp/>

#### The Soil Profile Newsletter

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"To simplify information in this newsletter, trade names of some products are used. No endorsement is intended nor is criticism implied of similar products not named."  
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# New Jersey Agriculture and Water Use

New Jersey Department of Environmental Protection – Division of Water Supply and Geoscience

Ian Snook, July 2015

The agricultural community contributes significantly to the economy and culture of our “Garden State”. While most people associate agriculture with our nation’s heartland, New Jersey is home to more than 9,100 farms covering 720,000 acres of farmland in 2012 (Ag Census, 2012). The state is among the leaders in many forms of agricultural production; New Jersey ranks 5<sup>th</sup> in blueberry and cucumber production, 4<sup>th</sup> in peach production, and 3<sup>rd</sup> in cranberry, spinach, and bell pepper production. The state also produces an abundance of tomatoes, corn, apples, strawberries, potatoes, hay, soybeans and nursery stock (Jersey Fresh, 2015). Part of this recipe for success is the ability of the agricultural community to irrigate its crops when rainfall is not sufficient.

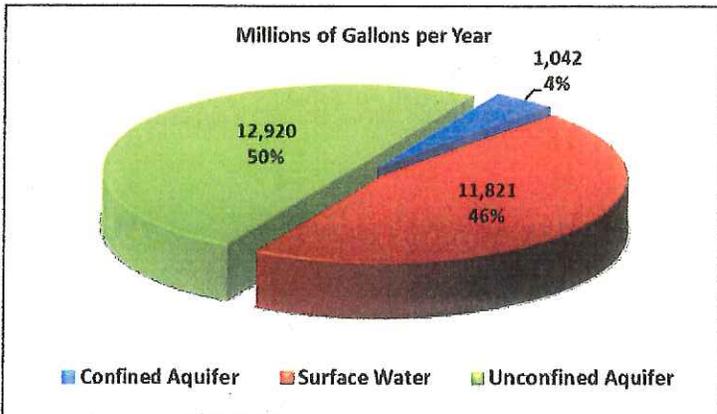


Figure 1: Withdrawals by Source, 2011

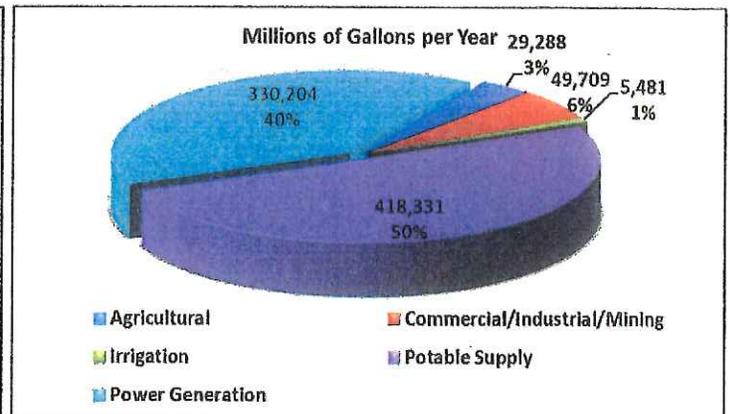


Figure 2: Withdrawals by Use Group, 2011

New Jersey’s agricultural irrigation withdrawals come from one of three sources: surface water, unconfined aquifers (shallow groundwater), or confined aquifers (deep groundwater). Figure 1 shows total surface water, unconfined groundwater, and confined groundwater withdrawals for 2011. In 2011 (the most recent year when quality controlled data is available), agricultural withdrawals totaled 29,288 million gallons of which 4% was withdrawn from confined groundwater sources, 46% was from surface water sources, and 50% was from unconfined groundwater sources. Figure 2 shows the percentage of total water withdrawn by use group, of which potable supply accounts for 50% of all withdrawals, followed by power generation and commercial/industrial/mining activities, leaving agricultural withdrawals ranked 4<sup>th</sup>. Figure 3 shows the total water withdrawals for agriculture by use type (subcategories of use groups) as tracked by the Department’s permits for 2011. Figure 4 shows the trend of agricultural water use from 2000-2011 which suggest a slight statewide decrease throughout the period.

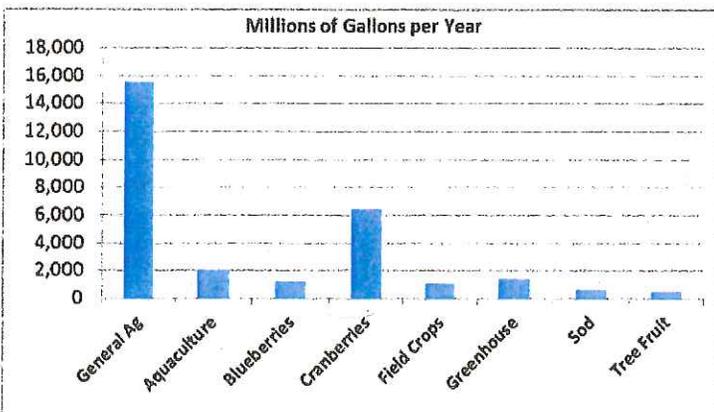


Figure 3: Agricultural Withdrawals by Use Type, 2011

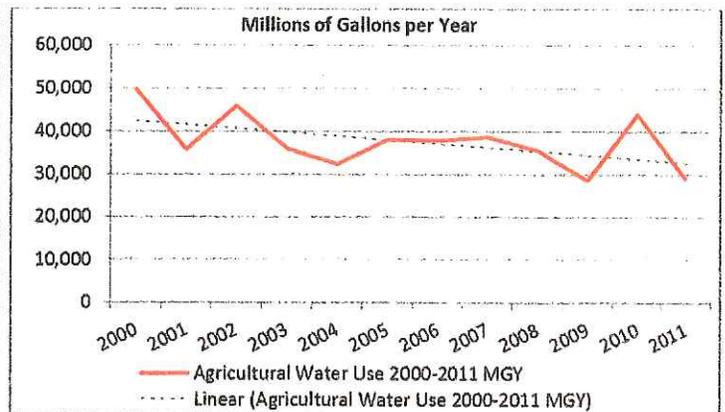


Figure 4: Agricultural Water Use 2000-2011

It should be noted that the majority of power generation withdrawals are minimally consumptive while agricultural withdrawals for irrigation are highly consumptive. Consumptive water use is defined as water use that is

permanently withdrawn from its source; water that is no longer available because it has evaporated, been transpired by plants, incorporated into products or crops, consumed by people or livestock, or otherwise removed for the immediate water environment (Amy Vickers, *The Handbook of Water Conservation*, 2015).

The Agriculture, Aquaculture, and Horticulture Water Usage Certification (Ag Cert) rules (N.J.A.C. 7:20A) govern water usage by the agricultural community. Under these rules, certification holders are required to submit annually, a record of the amount of water withdrawn each month. The NJDEP reviews usage reports and uses this info along with other water usage reports to ensure that agricultural water will be available for the future and to determine if the data is consistent with the irrigated acreage of previously reported totals in association with use/crop types. Table 1 shows the withdrawals by use sector and source in 2011 for each county of New Jersey.

County Withdrawals by Use Sector and Source in 2011 (Millions of Gallons per Year)								
County	Use Type					Source Water for Agriculture Sector Only		
	Agricultural Irrigation	Commercial /Industrial/ Mining	Non-Ag Irrigation	Potable Supply	Power Generation	Surface Water	Unconfined Aquifer	Confined Aquifer
Atlantic County	3,505	1,116	492	14,918	21	359	3,145	0
Bergen County	4	1,503	211	42,693	43	0	4	0
Burlington County	9,290	1,262	300	22,013	0	6,623	2,053	614
Camden County	358	1,002	232	17,458	0	28	328	2
Cape May County	285	1,817	210	6,266	0	17	265	3
Cumberland County	6,203	16,298	56	7,955	0	558	5,645	0
Essex County	2	251	170	11,783	0	0	2	0
Gloucester County	1,727	10,193	130	8,542	0	726	870	130
Hudson County	0	147	2	31	0	0	0	0
Hunterdon County	289	465	90	35,142	0	171	118	0
Mercer County	56	134	122	12,687	75,421	24	32	0
Middlesex County	168	1,210	326	13,610	0	67	78	23
Monmouth County	325	556	1,119	23,961	22	216	40	69
Morris County	201	922	145	35,185	0	121	80	0
Ocean County	1,395	5,806	1,160	22,940	0	1,320	68	7
Passaic County	14	333	51	75,660	198,809	4	11	0
Salem County	2,908	3,707	75	2,585	525	1,626	1,089	193
Somerset County	236	416	300	3,918	0	219	17	0
Sussex County	13	613	110	5,247	0	13	0	0
Union County	0	553	149	50,343	1,287	0	0	0
Warren County	2,308	1,408	32	5,395	54,076	89	2,219	0
<b>Grand Totals</b>	<b>29,288</b>	<b>49,709</b>	<b>5,481</b>	<b>418,331</b>	<b>330,204</b>	<b>12,181</b>	<b>16,065</b>	<b>1,042</b>

**Table 1: 2011 Water Withdrawals by County Use Sectors and Sources**

The agricultural industry's ability to access water becomes especially urgent during periods of drought. Lack of natural precipitation during critical growing periods must be supplemented by withdrawals from groundwater and surface water sources, which is why it is critical to track water use trends and constantly monitor the status of these critical resources to ensure their continued integrity. Whether it's through drip irrigation, best management practices, and/or educational programs it is extremely prudent to keep these efforts at the forefront of our everyday planning and practices.

For more information refer to Water Withdrawals in New Jersey from 2000 to 2009 available online at <http://www.njgeology.org/enviroed/infocirc/withdrawals2009.pdf> or New Jersey Water Transfer Model Withdrawal, Use, and Return Data Summaries available at <http://www.state.nj.us/dep/njgs/geodata/dgs10-3.htm>. This publication is a set of five Microsoft Access 2000 databases that contains the detailed water withdrawal data used to develop this report.