

# Cultivating Cumberland

August - 2016 VOL. 21, ISSUE 8



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### Attachments:

OSHA Agricultural Safety Fact  
Sheet

*Cooperative Extension  
of Cumberland County*



1915-2015

## SAVE THE DATE

After many years of service to Cumberland County as Agricultural Agent for the Commercial Nurseries and as Department Head of the Extension Center, Jim Johnson will be retiring as of September 1st.

**What:** Retirement Open House in honor of Jim Johnson

**Date:** August 26, 2016

**Where:** Rutgers Cooperative Extension  
291 Morton Avenue, Millville  
(Between Rosenhayn and Carmel)

**Time:** 5:00 p.m. - 8:00 p.m.

**Cost:** \$10.00 (includes participation in a gift for Jim)

Join us as we wish Jim the best. Jim begins his retirement on September 1st, 2016.

We will be having light refreshments at the Cumberland County Extension Center, 291 Morton Ave., Millville (Between Rosenhayn and Carmel) from 5:00 p.m. to 8:00 p.m. on August 26th.

Everyone is welcome to join us, whether you can stay 10 minutes or the entire time. Come reminisce with Jim about all the changes over the last 34 years.

Please RSVP to Tammy Commander at 856-451-2800 x1 if you plan to attend no later than August 19th.

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

## 2015 Center for Produce Safety Symposium Summary

In the last issue of “Cultivating Cumberland” we gave you the summary of the 2015 Produce Safety Symposium. We will, over the next several months, be expanding on the summary of each category. Below is the first expansion regarding hazard analysis and management.

**It has always been about hazard analysis and management.** Some hazards may be common across systems or processes and some may be unique to a specific farm, packing facility, distribution center or processing plant. Regardless of the nature of the potential risk of produce contamination, each company needs to identify potential hazards and then find ways to reduce, control or eliminate them as part of a robust food safety program. Several studies highlighted the importance of understanding operational risks. Some specific examples include:

- **Knowing your irrigation water source is critical.** George Vellidis, University of Georgia and Channah Rock, University of Arizona.
  - ◇ **Risk:** Irrigation ponds in the coastal plain of Georgia are contaminated with a low level, but persistent *Salmonella* strains that seem to be unique to each pond. *Salmonella* levels are subject to seasonal fluctuations (higher under warmer conditions) and can be elevated following rainfall (presumably due to run-off from the surrounding area or perhaps perturbations of the sediments at the bottom of the pond).

**What does that mean?** These data and observations from Georgia tell us that it is important to understand the microbial quality of the water we use for irrigation. They show that weather can impact sediments or cause run-off that can elevate human pathogen levels in the water. This corresponds well with the report from Dr. Rock that rainfall or maintenance work in irrigation canals in Arizona can result in exceedances of LGMA irrigation water standards for generic *E. coli*. These data points, while certainly not conclusive for every irrigation system around the globe, tell growers everywhere that their on-farm hazard analysis, should evaluate their irrigation water sources to determine what the microbial populations look like. FSMA requirements aside for a moment, it is important for growers seeking to develop a risk based food safety program to understand their irrigation system from source to delivery. They need to do this characterization over time as the environment changes during the course of the year and these changes can impact microbial water quality. The data also suggest that rain events can affect microbial populations and growers need to consider potential sources of human pathogens (e.g. feedlots, grazing land, septic systems, wild animal populations, etc.) to determine the potential for run-off from those areas to irrigation water sources. If growers find that there is a potential hazard for their operation, then they need to explore management practices to minimize those risks, e.g. scheduling maintenance of systems well in advance of irrigation, design of water delivery systems to crops, use of filtration systems, timing of irrigation applications, etc.

- ***Changing the production method, changes the hazard analysis.*** Faith Critzer, University of Tennessee.

- ◇ **Risk:** Different production methods represent different hazard profiles. Dr. Critzer's project has shown that when cantaloupes irrigated with water sources that can be compromised or accessed by cattle; the irrigation water delivery methods and the use of plasticulture influences the number of STEC-contaminated cantaloupes produced. For example, more cantaloupes drip irrigated without the use of plasticulture were contaminated than melons drip irrigated under plasticulture and cantaloupes produced using overhead irrigation were less likely to be contaminated than drip-irrigated cantaloupes.

**What does that mean?** This data is a reminder that production for fruits and vegetables is a process. If you make a change on one part of the process, it can change the entire dynamic of the process and the end product. That tells us that our hazard analysis needs to be a dynamic exercise that we revisit every time we make a change to our "process" of production; no matter how small. The use of plasticulture or the choices we make regarding the delivery of irrigation water are examples of changes to the "process" that have to be accounted for in our hazard analysis.

- ***Adjacent land use is important is important to any hazard analysis.*** Sid Thakur, North Carolina State University

- ◇ **Risk:** Microbial surveys of four diversified farms where livestock and produce are grown in close proximity in Tennessee and North Carolina revealed different human pathogen profiles. Soil, water and produce samples from two Tennessee farms were positive for STEC and *E. coli* O157:H7 while no pathogens were detected in soil, water and produce samples from the two North Carolina farms. Differences between the Tennessee and North Carolina farms included the proximity of surface water sources to animal operations. Generally, when human pathogens were detected, animals and produce were less than four hundred feet apart, but that distance was dependent on other operational variables, e.g. animal and equipment movement, water, insect control, deposition of animal wastes, etc. Wind/air did not appear to be a factor in pathogen dispersal.

**What does that mean?** These studies are ongoing, but they tell us that there are no absolutes. Hazard analysis must be conducted on a farm by farm, facility by facility basis as no two operations are exactly the same. It is not necessarily surprising that on two farms where livestock and produce are grown in close proximity that one would find human pathogens. The surprise might be that there were two farms where human pathogens were not found. The learning opportunity is to find out why. How are the variables controlled to limit human pathogen movement? Too often, we want to set a distance or develop a standard that removes judgments when in fact the way to produce safer produce is to analyze the risk associated with specific hazards contaminating produce on that specific operation and determine what can be done to manage risks. Distances, proximities, etc. are guideposts that must be proven for each operation. That means doing the work; taking the samples, observing the move-

ments of people, animals and products and taking that data and building the hazard analysis. As an example, CPS funded an excellent study in Nebraska a few years back by Dr. Elaine Berry; USDA that clearly pointed out the role wind can have in spreading E. coli. The research created an awareness of wind as a vehicle in human pathogen transfer on to fresh produce. In these studies in North Carolina and Tennessee, wind did not play a part in pathogen dispersal, but these researchers knew to look at it as a possibility based on the knowledge base previous research had created. While seemingly contradictory, there are numerous variable characteristics for each location; e.g. moisture, wind breaks, livestock movement patterns, etc. that would have to be considered when determining the specific risk that a microbial hazard would present if it were present.

Often we hear experts talk of the need for operations all along the produce supply chain to develop "risk and science-based food safety programs". The research described here suggests that we might consider more accurately describing our goal as developing "process-based food safety programs built on hazard analysis and science". This approach requires operational and scientific knowledge but the body of knowledge being built by produce safety research must serve as the basis on which operators make informed food safety management decisions.

# 10 Fascinating Facts About Mosquitoes

## Interesting Behaviors and Traits of Mosquitoes



Ah, mosquitoes, the insects that are universally hated the world over. These pesky, disease-carrying pests make a living by sucking blood out of just about anything that moves, including us. But take a moment to look at things from the mosquito's perspective - it's a pretty interesting life.

### 1. Mosquitoes are the deadliest animals on Earth.

That's right, more deaths are associated with mosquitoes than any other animal on the planet.

Mosquitoes may carry any number of deadly diseases, including malaria, dengue fever, yellow fever and encephalitis. Mosquitoes also carry heartworm, which can be lethal to your dog.

### 2. Only female mosquitoes bite humans and animals; males feed on flower nectar.

Mosquitoes mean nothing personal when they take your blood.

Female mosquitoes need protein for their eggs, and must take a blood meal in order to reproduce. Since males don't bear the burden of producing young, they'll avoid you completely and head for the flowers instead. And when not trying to produce eggs, females are happy to stick to nectar, too.

### 3. Some mosquitoes don't bite humans, preferring other hosts like amphibians or birds.

Not all mosquito species feed on people. Some mosquitoes specialize on other animals, and are no bother to us at all. *Culiseta melanura*, for example, bites birds almost exclusively, and rarely bites humans. Another mosquito species, *Uranotaenia sapphirina*, is known to feed on reptiles and amphibians.

### 4. Mosquitoes fly at speeds between 1 and 1.5 miles per hour.

That might sound fast, but in the insect world, mosquitoes are actually rather slow. If a race were held between all the flying insects, nearly every other contestant would beat the pokey mosquito. Butterflies, locusts, and honey bees would all finish well ahead of the skeeter.

### 5. A mosquito's wings beat 300-600 times per second.

This would explain that irritating bussing sound you hear just before a mosquito lands on you and bites.

**6. Mosquito mates synchronize their wing beats to perform a lover's duet.**

Scientists once thought that only male mosquitoes could hear the wing beats of their potential mates, but recent research on *Aedes aegypti* mosquitoes proved females listen for lovers, too. When the male and female finally meet, their bussing synchronizes to the same speed.

**7. Salt marsh mosquitoes may travel up to 100 miles from their larval breeding habitat.**

Most mosquitoes emerge from their watery breeding ground and stay pretty close to home. But some, like the salt marsh mosquitoes, will fly lengthy distances to find a suitable place to live, with all the nectar and blood they could want to drink.

**8. All mosquitoes require water to breed. Some species can breed in puddles left after a rainstorm.**

Just a few inches of water is all it takes for a female to deposit her eggs. Tiny mosquito larva develops quickly in bird baths, roof gutters, and old tires dumped in vacant lots. If you want to keep mosquitoes under control around your home, you need to be vigilant about dumping any standing water every few days.

**9. An adult mosquito may live 5-6 months.**

Few probably make it that long, given our tendency to slap them silly when they land on us. But in the right circumstances, an adult mosquito has quite a long life expectancy, as bugs go.

**10. Mosquitoes can detect carbon dioxide from 75 feet away.**

Carbon dioxide, which humans and other animals produce, is the key signal to mosquitoes that a potential blood meal is near. They've developed a keen sensitivity to CO<sub>2</sub> in the air. Once a female senses CO<sub>2</sub> in the vicinity, she flies back and forth through the CO<sub>2</sub> plume until she locates her victim.

## **Dickeya dianthicola Reported**

Dr. Andy Wyenandt, Rutgers University

*Dickeya dianthicola* has been reported in potato in Rhode Island this summer. This makes it the 11th state this summer to report the pathogen in potato. The pathogen has also been detected in NJ, MA, DE, PA, MD, VA, NC, WV, and FL this year. All potato growers, crop consultants, scouts, industry representatives, and Extension personnel in states which grow potatoes should remain vigilant by scouting their fields for *Dickeya* symptoms on a regular basis and by submitting any suspect samples for diagnostic testing. Additionally, in recent days and weeks there has been a lot of misinformation circulating (both written and in person) about the pathogen – *Dickeya*, its biology, potential sources of the inoculum, and much more. All potato growers when deciding on where and from whom to buy their seed from next year need to do their own due diligence, talk with other growers [(especially those who have had the unfortunate experience with *Dickeya* and have received infested lot(s))] and to speak with their local Extension Service to find out the facts to help them make the appropriate decisions to avoid problems. The best method for keeping *Dickeya* off of your potato farm and to avoid potential losses is to adopt your own zero-tolerance policy for the disease.

## **Emerald Ash Borer Answers**

Richard Buckley, Rutgers University

The NJ Emerald Ash Borer Task Force has agreed upon the following in response to EAB management questions in NJ:

- All ash trees in NJ should be considered at high risk for EAB.
- It is appropriate to begin treatment of high value ash trees throughout NJ now.
- For any questions about treatment methods, we should refer to the “Insecticide Options for Protecting Ash Trees from Emerald Ash Borer” bulletin on the website ([emeraldashborer.nj.gov](http://emeraldashborer.nj.gov)).
- We should recommend that people work with a Certified (Licensed) Tree Expert or Approved Consulting Forester to help them determine whether or not their ash trees are good candidates for a treatment program (vs. removal), and that they should contract a Certified Pesticide Applicator to complete any chemical treatments.
- Any trees determined to be of high safety risk should be removed immediately.
- Any actively infested trees should be cut down and chipped as soon as possible and then left on site (in the municipality).
- For all other ash, it is best to complete removals in the fall and winter. The material must be processed (chipped or de-barked) before emergence (by late April).
- For municipalities, we should recommend triage of the ash resource to spread out ash removals over several years.

Rich Buckley at the Rutgers Plant Diagnostic Lab has agreed to examine samples for EAB at no charge as long as they are brought to the lab. Anyone interested should contact the Rutgers Plant Diagnostic Lab at 732-932-9140, and should bring the beetle, larvae, or sample of symptomatic tissue (chunk of bark with exit wound).

The NJ EAB Task Force is comprised of representatives from the NJ Department of Agriculture, NJ State Forest Service, USDA APHIS, Rutgers University, and the US Forest Service. The Task Force works to collaborate on EAB management decisions and advice, and to consolidate and disburse information and resources relevant to EAB in New Jersey.

### **Vegetable Twilight Meeting and Research Tour**

Wednesday, August 24, 2016, 5:30 p.m. (meet at the shelter near parking lot)  
Rutgers Agricultural Research & Extension Center  
121 Northville Road, Bridgeton, NJ (Upper Deerfield)

Tomato Tasting will be at the picnic shelter and the wagon  
tour will leave at 6:00 p.m. to visit the trials

5:30 p.m. – **Taste the new tomato breeding lines** – Tom Orton, PhD, Specialist in Vegetables

6:00 – **Mother fern system for growing summer asparagus** – Tom Orton, PhD, Specialist in Vegetables

6:15 - **\*Pepper variety trial for resistance to ten races of bacterial leaf spot** – Wes Kline, PhD, County Agricultural Agent

6:30 – **Summer/Winter squash and cucumber fungicide evaluations for downy and powdery mildew control** - C. Andrew Wyenandt, PhD, Specialist in Vegetable Pathology

7:00 – **Fungicide evaluations for basil downy mildew control** – C. Andrew Wyenandt, PhD, Specialist in Vegetable Pathology

7:30 – **Fungicides for controlling Phytophthora Blight in cucurbits** – C. Andrew Wyenandt, PhD, Specialist in Vegetable Pathology

8:00 – **Evaluation of Bell Pepper varieties and breeding lines for Phytophthora blight management** – Wes Kline, PhD, County Agricultural Agent

8:30 – **Fungicide evaluations of peppers for Phytophthora blight and Anthracnose management** – C. Andrew Wyenandt, PhD, Specialist in Vegetable Pathology

9:00 – **\*Fungicide management for Bacterial Leaf Spot control in peppers** – C. Andrew Wyenandt, PhD, Specialist in Vegetable Pathology

\*Note: The pepper studies are funded in part through the Charles E. and Lena Maier Fund, Vegetable Growers Assoc. of New Jersey and the New Jersey Agricultural Experiment Station

Pesticide credits: 6 each for categories 10, 1A and PP2



Michelle Infante-Casella  
Agriculture Agent, RCE  
Gloucester County



Wesley Kline  
Agriculture Agent, RCE  
Cumberland County



Richard VanVranken  
Agriculture Agent, RCE  
Atlantic County

## Calendar of Important Events

↻ Indicates the newly added event since last calendar

### August 2016

#### **August 2-3**

**2016 Rutgers Turfgrass Research Field Days**, 8/2 Hort Farm 2, 102 Ryders Lane, North Brunswick, NJ; 8/3 Adelphia Farm 594 Halls Mills Rd., Freehold. To register online visit: [www.njturfgrass.org](http://www.njturfgrass.org) or call 973-812-6467. Available pesticide credits: 2 CORE credits; 6 credits each for categories 3B, PP2, and 10.

#### **August 6**

**Sense & Scents-Ability “All About the Birds and the Bees”**, Colonial Park Gardens, 156 Mettlers Road, Somerset, NJ. Free (suggested donation); 11am-2pm. For more information call 732-873-2459.

#### **August 8-11**

**Potatoes USA summer meeting**, Cedarbrook Lodge, Seattle, Washington. For more information email: [Caitlin@uspotatoes.com](mailto:Caitlin@uspotatoes.com)

#### **August 22-26**

**Introduction to Food Science**, Rutgers Continuing Education; \$1,495 by 8/8. For more information visit: [www.cpe.rutgers.edu/food](http://www.cpe.rutgers.edu/food) or call 1-848-932-9271 x2.

#### ↻ **August 24**

**Vegetable Twilight Meeting**, Rutgers Agricultural & Research Center, 121 Northville Road, Bridgeton, NJ. Tomato tasting begins at 5:30 p.m. and wagon tours begin at 6:00 p.m. For more information see agenda on page 8 of this newsletter or call 856-451-2800 x1.

### September 2016

#### **September 10**

**Autumn in the Perennial Garden**, Colonial Park Gardens, 156 Mettlers Rd., Somerset; \$15 per person with a limit of 30 people. For more information/to register, call 732-873-2459.

#### **September 17**

**Flower & Garden Photography**, Colonial Park Gardens, 156 Mettlers Rd., Somerset; \$35.00 a person with 12 people limit. Pre-registration by 9/9 required. For more information/to register, call 732-873-2459.

### October 2016

#### **October 5-7**

**HACCP Plan Development for Food Processors**, Rutgers Continuing Education; \$945 by 9/21; \$995 after. For more information call 1-848-932-9271 x2 or visit: [www.cpe.rutgers.edu/FOOD](http://www.cpe.rutgers.edu/FOOD)

#### **October 14-16**

**Produce Marketing Association Fresh Summit**, Orlando, Florida. For more information visit: [www.pma.com](http://www.pma.com)

#### **October 17-18**

**Sensory Evaluation**, Rutgers Continuing Education. For more information call 848-932-9271 or visit: [www.cpe.rutgers.edu](http://www.cpe.rutgers.edu)

**October 19**

**Statistics for Food Scientists**, Rutgers Continuing Education, New Brunswick. For more information call 848-932-9271 or visit: [www.cpe.rutgers.edu](http://www.cpe.rutgers.edu)

**November 2016****November 7-9**

**Better Process Control School**, Rutgers Continuing Education, New Brunswick. \$995 by 10/24; \$1095 after. For more information call 848-932-9271 or visit: [www.cpe.rutgers.edu](http://www.cpe.rutgers.edu)

**November 15-16**

**Drone World Expo**, San Jose Convention Center, San Jose, CA. For more information visit: [www.droneworldexpo.com](http://www.droneworldexpo.com)

**November 19**

**Thanksgiving Floral Arrangement Class**, 2016 Horticultural Programs/Events, Park Commission Headquarters, North Branch Park, 355 Milltown Road, Bridgewater. 10a.m.—12 noon; \$25 per person with a limit of 15 people and includes supplies. Pre-registration due by Thursday, November 10th is required. For more information call 732-873-2459 x21 or visit: [www.somersetcountyparks.org](http://www.somersetcountyparks.org)

**December 2016****December 3**

**Holiday Kissing Ball Workshop**, 2016 Horticultural Programs/Events, Park Commission Headquarters, North Branch Park, 355 Milltown Road, Bridgewater. 10am-12 noon; \$45 per person (limit 15 people & includes supplies). For more information call 732-873-2459 x21 or visit: [www.somersetcountyparks.org](http://www.somersetcountyparks.org)

**December 5-6**

**Practical Food Microbiology**, Rutgers Continuing Education, New Brunswick. \$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)

## REGULARLY SCHEDULED MEETINGS

✓ Indicates meeting will be held at RCE of Cumberland County

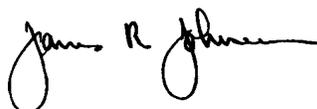
<p>✓</p> <p><b>Pesticide Certification Exam Schedule—Cumberland County</b> 291 Morton Avenue Millville, NJ 08332 (Between Rosenhayn &amp; Carmel)</p> <p><u>2016</u></p> <p>Sept 22     Oct 20</p> <p><b>To Register call 609-984-6614 For directions call 856-451-2800</b> *****</p>	<p>✓</p> <p><b>Cumberland County Agriculture Development Board</b> Soil Conservation Office 1516 Highway 77 Deerfield Street, NJ 08332</p> <p><u>2016</u></p> <p>Aug 10    Set 14 Oct 12    Nov 9    Dec 14</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></p> <p>Sept 15                    Oct 20 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

Aug 19  
Sept 16    Oct 21    Nov 18

Sincerely,



James R. Johnson  
Agricultural Agent  
Nursery Management Commercial  
Internet: [jjohnson@njaes.rutgers.edu](mailto:jjohnson@njaes.rutgers.edu)



Wesley L. Kline, Ph.D.  
Agricultural Agent  
Vegetable & Herb Production  
Internet: [wkline@njaes.rutgers.edu](mailto:wkline@njaes.rutgers.edu)

**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*

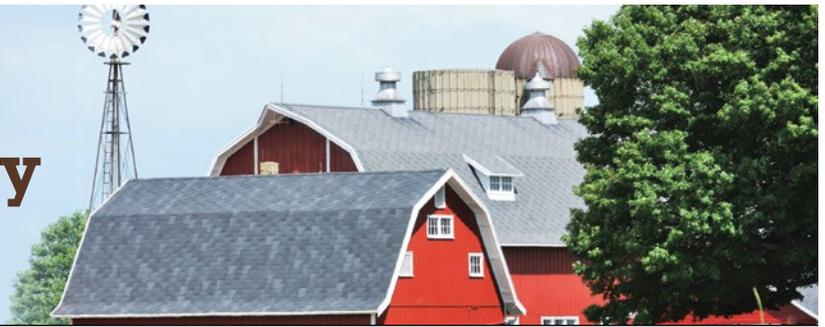
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Extension Education Center  
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Millville, NJ 08332-9791

**RUTGERS**  
New Jersey Agricultural  
Experiment Station



# Agricultural Safety Fact Sheet



## Preventing Farm Vehicle Backover Incidents

Backing up farm equipment and vehicles is a daily occurrence in the agricultural industry. Backover incidents occur when a backing vehicle strikes a worker who is standing, walking, or kneeling behind that vehicle. These incidents can be prevented. Backover incidents can result in serious injuries or deaths to farmworkers. Employers are responsible for maintaining a safe workplace for every worker. This fact sheet provides employers with information about backover hazards and safety measures.

### Preventing or Minimizing Backover Hazards

Most backover incidents are due to the employer's failure to train vehicle operators and enforce proper backing up techniques and preventive safety measures. Employers should ensure that unnecessary backing up is avoided. In addition, employers should also ensure that both the operator and other workers are always aware of their surroundings. Moreover, employers should develop and require the use of alternate travel routes and backover safety systems, which are effective safeguards to prevent backover incidents.

### Hitching Farm Equipment and Implements

Helpers often assist operators in backing up and hitching farm vehicles (e.g., truck or tractor). However, helpers working behind these vehicles risk becoming caught and crushed between the vehicle and the equipment being hitched. Employers should require the use of the following hitching and backing up safety measures.

#### Hitching operations without a helper:

- Inspect the equipment, including the hydraulic and electrical connections, drawbar hole and hitch pin, and the three-point hitch.
- Ensure that no one is standing or working behind the vehicle.
- If available, use the vehicle backup camera and alarm to ensure that objects are not in the vehicle's path.
- Back up the vehicle slowly to align the hole in the drawbar with the hole in the implement hitch.
- Stop and put the vehicle in park, or lock the brakes.



*Farmworkers on foot are at risk of being backed over by a farm vehicle.*

- If required, dismount to connect the electrical and hydraulic connections and safety chains.
- Hitch the equipment to the vehicle.
- Release the parking brake/lock, place the vehicle in gear and slowly drive away.

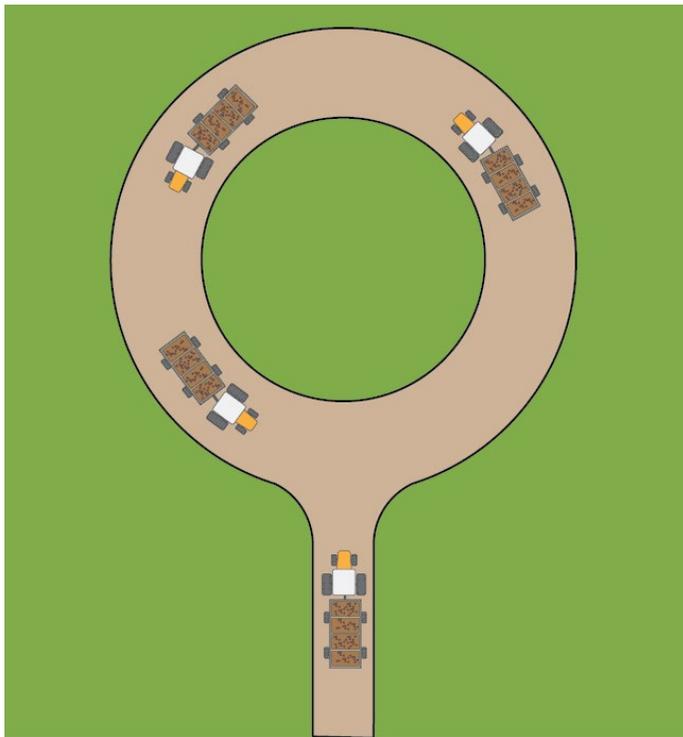
#### Hitching operations with a helper:

- Inspect the equipment, including the hydraulic and electrical connections, drawbar hole and hitch pin, and the three-point hitch connection if applicable.
- Ensure that coordinated ASABE hand signals are understood and used (see below for coordinated hand signals).
- Back up the vehicle at the slowest speed possible toward the equipment.
- Until the vehicle is stopped, the helper should stand outside the path of the vehicle.

- After the drawbar and equipment are aligned, stop and put the vehicle in park, or lock the brakes.
- Signal the helper that it is safe to approach the vehicle for a close inspection and to prepare for hitching operations.
- If required, attach the electrical and hydraulic connections and safety chains. Move the vehicle forward or backward a few inches, if needed, to allow the helper to drop in the hitch pin.

**To prevent backover incidents, employers should:**

- Regularly assess each work location to determine if a traffic control plan is needed.
- Establish drive-through or circular turnaround areas. If this is not possible, provide adequate space for operators to perform a three-point turn.
- Ensure that all turnaround areas are level, firm, and well-drained to prevent vehicles from tipping over.
- Determine if a backup camera or system is needed.
- Never allow workers to eat lunch or rest near active working vehicles and equipment.
- Identify where workers might stand or walk unexpectedly.
- Determine if a spotter is required.
- Instruct workers and operators not to use personal mobile phones, headphones or any items that could create a distraction.



*A circular turnaround area is the safest way to allow safe entry and exit of farm equipment and vehicles.*

## Working Conditions

### Working at night

The lack of light can increase the operator's blind spots, as well as impair his or her ability to see other workers. Employers should provide sufficient lighting for the worksite and vehicle, and require workers to wear reflectors or high-visibility vests to make them more visible.

### Working in bad weather

Bad weather, such as heavy rain, can pose particular hazards to workers and operators. Strong rain can reduce the operator's visibility and make it very difficult to recognize workers and other vehicles that may be nearby. If the workers are at risk due to bad weather, employers should stop the work and ensure that the workers stay clear of moving vehicles until it is safe to return.

## Training

### Employers should train vehicle operators to:

- Become familiar with backing up hazards and worksite safety measures.
- Back up only when necessary and for as short a distance as possible.
- Check the surrounding area for obstacles, other workers, and equipment.
- Understand the limitations of their vehicles and equipment, and operate them only in the way they were intended to be operated.
- Keep mirrors clean and adjusted properly to minimize blind spots.
- Know the vehicle's blind spots — mirrors never give the entire view.
- Check that backup alarms, sensors, and cameras are functioning properly.
- Look under vehicles and trailers for workers; remember that some workers may not respond to verbal or mechanical warnings.
- Honk the vehicle's horn and turn on the 4-way flashers, if necessary when backing up.
- Roll down cab windows, and if necessary, open the vehicle's doors so that a person shouting can be heard.
- Understand that snow, mud, slush, or ice may prevent sudden stops and cause the vehicle to move in an unexpected manner.
- Understand that bad weather may compromise the operator's ability to hear or see warnings.
- Always back up at a slow speed and watch carefully in all directions.

## Employers should train farmworkers on foot to:

- Stand where they can see the vehicle's mirrors whenever possible.
- Never go between a moving vehicle and any equipment that is hitched or being towed.
- Never stand or linger in a vehicle's path.
- Never rest or sleep next to or under an agricultural work vehicle or equipment.
- Inform other workers when vehicles are approaching.
- Listen for the vehicle's backup alarm and watch the vehicle's movement.

- Never assume that the vehicle's operator can see them.
- Never wear earbuds or headphones when working near farm vehicles and equipment.

## Using Hand Signals and Spotters

Distance and noise can make voice commands very difficult to hear or understand in some agricultural locations. Agricultural hand signals have been developed for farm machinery operators by the [American Society of Agricultural and Biological Engineers \(ASABE/E19\)](#). Hand signals can prevent accidents and save time. Learning

### American Society of Agricultural and Biological Engineers (ASABE/E19) Hand Signals



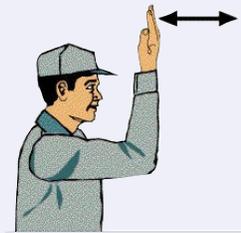
**Start the engine.** Move arm in a circle at waist level as though you were cranking an engine.



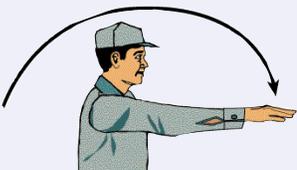
**Stop the engine.** Move your right arm across your neck from left to right in a "throat-cutting" motion.



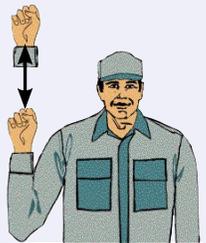
**Come to me — may mean "Come help me" in an emergency.** Raise arm vertically overhead, palm to the front, and rotate in large horizontal circles.



**Move toward me — follow me.** Look toward person or vehicle you want moved. Hold one hand in front of you, palm facing you, and move your forearm back and forth.



**Move out — take off.** Face desired direction of movement. Extend arm straight out behind you, then swing it overhead and forward until it's straight out in front of you with palm down.



**Speed it up — increase speed.** Raise hand to left shoulder, fist closed. Thrust fist upward to full extent of arm and back to shoulder rapidly several times.



**Slow it down — decrease speed.** Extend arm horizontally at your side, palm down, and wave arm downward (45 degrees minimum) several times, keeping arm straight. Don't move arm above horizontal.



**Raise equipment.** Point upward with forefinger while making a circle at head level with your hand.



**Lower equipment.** Point toward the ground with forefinger of one hand while moving the hand in circular motion.



**This far to go.** Put hands in front of face, palms facing each other. Move hands together or farther apart to indicate how far to go.



**Stop.** Raise hand upward, arm fully extended, palm to the front. Hold that position until the signal is understood.

hand signals will give workers and drivers an easy and effective way to communicate. Employers should train and require drivers and spotters to use the ASABE's hand signals in all agricultural operations, especially when noise or distance is a factor.

## Vehicle Safety Devices and Warning Systems

Many safety devices and warning systems, including backup alarms, large backup lights, sensors, alarms that beep continuously while the vehicle is in reverse, and rear-view cameras, have come on the market and are now essential components of modern day farm vehicles. Older agricultural farm vehicles may lack these safety devices and systems. Planning ahead, establishing sound safety procedures, and adding safety warning devices to farm vehicles can help prevent backover incidents and injuries.

## Workers' Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace. Review records of work-related injuries and illnesses.
- 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. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see [OSHA's Workers page](#).

**For questions or to get information or advice, to report an emergency, fatality, inpatient hospitalization, amputation, or loss of an eye, to file a confidential complaint, or to request OSHA's free on-site consultation service, 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.**

**For more information on ATV safety and other issues affecting farmworkers, visit OSHA's Safety and Health Topics Agricultural Operations website at [www.osha.gov/dsg/topics/agriculturaloperations](http://www.osha.gov/dsg/topics/agriculturaloperations).**

**For assistance, contact us. We can help. It's confidential.**



U.S. Department of Labor

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

