



# SPROUTS

## Tennessee Vegetable News

Volume 2, Issue 4

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### What's new?

#### University of Tennessee Organic Outreach Initiative

The University of Tennessee, in cooperation with the Tennessee Department of Agriculture, is launching a statewide organic agriculture initiative. The intent of this initiative is to involve more Tennessee farmers in organic production in order to increase farm income and to provide an alternative to keep the family farm in the family.

Organic production has the potential to increase profits by reducing the use of off-farm inputs and providing consumers with locally-grown, high-quality organic products in a rapidly growing market where the demand is greater than the supply.

In a collaborative effort among growers, university researchers, extension specialists, industry, and government, an organic production network will be created across the state in order to address critical issues in organic agriculture. Through a twelve-part, yearlong lecture and hands-on demonstration series for commercial growers set for next year, we will fill in the gaps on how to "grow organic".

Workshops will cover organic opportunities in Tennessee, transitioning to organic, what you need to know about organic certification, how to market organic products, as well as the nuts and bolts of

record keeping and production issues, such as seed supplies, fertilizer, crop rotation and pest management.

Moreover, on-farm research and organic production demonstrations will be conducted with cooperating farmers, as well as on the newly dedicated 21-acre UT Organic Research Unit in Knoxville. Applied research will focus on conservation tillage techniques, high-tunnel production, variety trials, and evaluating the use cover crops for: optimizing fertility, enhancing beneficial insect populations, reducing soil-borne pathogens, and managing weeds.

Through this comprehensive organic outreach and research effort, Tennessee producers will have an opportunity to diversify their farm offerings and capture additional farm income.

We are currently in the process of interviewing for an Extension Specialist and an Extension Assistant that will be dedicated specifically to the organic initiative. We hope to have both on board in the coming months.

Keep reading SPROUTS to learn of new developments in the initiative.

#### Tennessee Farm Fresh Program Now Accepting Producer Applications

Tennessee Farm Fresh is a program in cooperation with the Tennessee Farm Bureau

Federation and the Tennessee Department of Agriculture that offers producers and consumers the chance to support their local economy. Buying products straight from the farm is a growing trend nationwide and the program's goal is to give local producers the ability to market farm fresh products directly to their neighbors.

The program offers producer identification and consumer communication. Program benefits include educational opportunities, marketing assistance and advertising support for participating producers. Tennessee has a variety of locally produced specialty crops and other agricultural products. Local consumers will soon be able to more easily identify and buy from producers as the program identity develops.

To be eligible for the program, a producer must agree to the Tennessee Farm Fresh Guidelines, pay a \$100 annual fee, fill out the application and send all of these to the program coordinator, Tiffany Mullins. Producers will be notified of approval into the program by the Tennessee Farm Fresh program coordinator and review committee.

*This information was taken from the Tennessee Farm Fresh website.*

For more information, contact Tiffany Mullins at 931.388.7872 ext. 2763 or [tmullins@tbf.com](mailto:tmullins@tbf.com), or visit: [www.tnfarmfresh.com/](http://www.tnfarmfresh.com/).



#### Of special interest:

- ▣ UT Organic Outreach Initiative
- ▣ Tennessee Farm Fresh Program
- ▣ Good Agricultural Practices
- ▣ Sweetpotato Storage

#### Inside this issue:

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## Review of Good Agricultural Practices

As the production season gets underway, now is a good time to review the good agricultural practices (GAPs) that you use in your operation.

Are there steps that you could take to reduce the risk of microbial contamination on your farm?

The National GAPs Program, based at Cornell University, put together a brochure (below) outlining steps that you can take to minimize pathogen contamination during pre-plant, production, harvest and post-harvest production. These are *voluntary* suggestions, but more and more buyers are *requiring* practices like these- or even more stringent practices- of their growers.

As you read through these GAPs, think about changes you could make in your operation to adopt safer practices.

**Food safety is everyone's responsibility.**

### Pre-Plant

#### Select Produce Fields Carefully

- ✓ Review land history for prior use and applications of sludge or animal manure.
- ✓ Choose fields upstream from animal housings.
- ✓ Know upstream uses of surface water and test water quality as needed.
- ✓ Prevent runoff or drift from animal operations from entering produce fields.

#### Store Manure

- ✓ Store slurry in continuously loaded systems for 60 days in

summer or 90 days in winter prior to field application.

- ✓ Consider satellite storage for slurry used on produce fields.
- ✓ Compost manure properly to kill pathogens.

#### Time Applications and Incorporate Manure

- ✓ In fall- apply manure to all planned vegetable ground, preferably when soils are warm (>50°F), non-saturated, and cover cropped.
- ✓ In spring- incorporate manure two weeks prior to planting.
- ✓ Whenever possible, incorporate manure.
- ✓ Do NOT harvest produce within 120 days after manure application.
- ✓ Keep records of application rates, source, and dates.

*\*\*\* Since the original publication of this brochure and the spinach E. coli outbreak of 2006, some commodity groups (i.e., The Western Growers Association) have prohibited the use of uncomposted manure on crop fields.*

#### Choose Crops Carefully

- ✓ Avoid root / leafy crops if manure is applied in spring.
- ✓ Plant agronomic or perennials crops where manure is applied in spring.

### Production

#### Do NOT Sidedress with Manure

- ✓ **ABSOLUTELY DO NOT SIDEDRESS** with fresh or slurry manure or manure 'tea' or mulches containing fresh manure.
- ✓ OK to sidedress with mature composts or compost teas.

#### Exclude Animals

- ✓ NO grazing of livestock near

produce fields.

- ✓ Minimize wild and domestic animal traffic in produce fields.

#### Promote Worker Hygiene in the Field

- ✓ Provide and maintain clean restrooms.
- ✓ Supply soap, clean water and single-use towels for hand washing and enforce use.

#### Test Irrigation Water Quality

- ✓ Identify water source for irrigation.
  - Municipal drinking water- low risk
  - Potable well water- minimal risk if well casing is maintained and livestock excluded from active recharge area
  - Surface water- high risk
- ✓ Test quarterly or during season (beginning, mid or high draw, and at harvest) if water source passes near livestock or sewage treatment.
- ✓ Filter or use settling ponds to improve water quality.
- ✓ Use potable water for crop protection sprays.
- ✓ Maintain records of water tests.

#### Select Irrigation Method

- ✓ Where feasible, use drip irrigation to reduce crop wetting and minimize risk.
- ✓ Apply overhead irrigation early in the day so leaves dry quickly.

### Harvest

#### Clean Harvest Aids

- ✓ Check that bins are clean and in good repair.
- ✓ High-pressure wash and sanitize bins prior to harvest and clean bins daily during harvest.

*Plastic bins would be the best choice. Wooden bins cannot be properly sanitized. Cardboard*

*cannot be washed or sanitized and reusing cardboard boxes should be avoided.*

- ✓ Remove excess soil from bins in field.
- ✓ Ensure that packing containers are not overfilled and protect produce adequately from bruising and damage.

#### Handle Produce Carefully During Harvest

- ✓ Avoid standing in bins during harvest to reduce pathogen spread by shoes.
- ✓ Minimize bruising of produce during harvest.
- ✓ Remove excess soil from produce in the field.

#### Promote Cleanliness at U-Pick

- ✓ Invite customers to wash their hands prior to entering fields.
- ✓ Provide clean and convenient restrooms.
- ✓ Supply soap, clean water, and single-use towels and encourage use.

#### Promote Worker Hygiene (see "Production")

#### Keep Produce Cool

- ✓ Cool produce quickly to minimize growth of any potential pathogens.
- ✓ Use ice made from potable water.
- ✓ Store produce at appropriate temperatures to maintain good quality.
- ✓ Do not overload coolers.

*Additionally, keep harvested produce in the shade (i.e., under a tree AND covered with a tarp), until it can be transported to the packing house. Parking an uncovered load under a tree, is an invitation for birds and rodents in the tree to use that load as their restroom facility.*

**(Continued on page 3)**

## Question of the Week

**Q:** I visited a sweetpotato producer recently, who has grown sweetpotatoes for 20 years. This year he found that after storing the sweetpotatoes, it looked like their were worms crawling underneath the skin (see picture at right). Have you seen this before?

**A:** The symptom in this photo is commonly called veining. It looks like varicose veins. Certain clones/varieties are more susceptible to this condition. The condition usually is more apparent over time as the sweetpotato loses moisture. I would bet this sweetpotato has not been kept under ideal storage conditions. To ensure the maximum

storage life of sweetpotatoes, they should be cured before storing. Curing has several benefits, including healing cuts, reducing decay and shrinkage in storage, by toughening up the outer skin or periderm, and improving flavor. During the curing process, some of the starch is converted into sugars, thereby, making a sweeter potato.

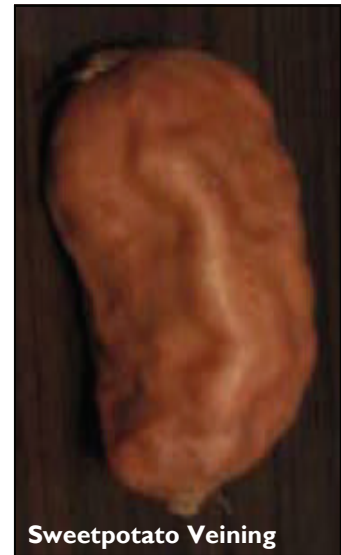
Curing should be started as soon as possible after harvest (within 1 to 2 hours) and last for a few days up to a week. To cure, the sweetpotatoes should be held at 85 °F and 90 to 95% relative humidity with periodic airing. If they are harvested earlier in the season, you could get away

with a few days as the soil and air temperatures are still warm, and the roots will cure faster. Later in the season, curing should last the a whole week, as the cooler air and soil make the roots cooler to start.

Once cured, the roots can be transferred to their storage temperature. The storage temperature should be 55 to 60 °F and the relative humidity maintained at 85 to 90% with at least one volume of air exchange daily.

If properly cured and stored, sweetpotatoes can be held up to 10 months.

For more on sweetpotato production, visit: [www.cals.ncsu.edu/sustainable/peet/profiles/c18swpot.html](http://www.cals.ncsu.edu/sustainable/peet/profiles/c18swpot.html).



Sweetpotato Veining

If you have a question, send it to: [annettew@utk.edu](mailto:annettew@utk.edu).

## GAPs (Continued from page 2)

### Post-Harvest Handling

#### Promote Worker Hygiene and Health

✓ Teach workers about microbial risks and the importance of hygiene.  
\*\*\*Be sure to keep records of all worker trainings, with the names of everyone present listed on a signed attendance sheet.

✓ Provide clean restrooms with soap, clean water, and single-use towels.  
✓ Post signs (in the workers native language) in restrooms and enforce hand washing.  
✓ Provide non-food contact jobs for sick employees.

#### Monitor Wash Water Quality

✓ Use potable water for all washes.  
✓ Maintain clean water in dump tanks by sanitizing and changing water regularly.

- ✓ Chlorinate wash water.
  - Monitor chlorine levels
  - Maintain 150 ppm for leafy vegetables and up to 500 ppm for other crops
  - Maintain water pH 6.0-7.0
  - Provide final rinse if using >100 ppm chlorine
- ✓ Avoid tank water temperatures more than 10°F cooler than produce temperature.

#### Sanitize Packing House

- ✓ Clean and sanitize loading, staging, and all food contact surfaces at end of each day.
- ✓ Exclude all animals, especially rodents and birds from the packing house.
- ✓ No smoking or eating in packing area.

#### Transportation and Refrigeration

- ✓ Check and clean trucks prior to loading.
- ✓ Sanitize if animals previously hauled.

- ✓ Pre-cool vehicles prior to loading.
- ✓ Ensure that refrigeration equipment is working properly.

This information was taken from the National GAPs Program publication 'Reduce Microbial Contamination with Good Agricultural Practices.' This publication, along with many more resources, is available on-line in both English and Spanish at: [www.GAPs.cornell.edu](http://www.GAPs.cornell.edu).



### Other Food Safety Resources:

● FDA Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits & Vegetables In Brief  
[www.cfsan.fda.gov/~dms/prodglan.html](http://www.cfsan.fda.gov/~dms/prodglan.html)

● FDA Commodity Specific Food Safety Guidelines:  
→Tomatoes  
[www.cfsan.fda.gov/~dms/tomatsup.html](http://www.cfsan.fda.gov/~dms/tomatsup.html)  
→Melons  
[www.cfsan.fda.gov/~dms/melonsup.html](http://www.cfsan.fda.gov/~dms/melonsup.html)  
→Leafy Greens  
[www.cfsan.fda.gov/~dms/lettsup.html](http://www.cfsan.fda.gov/~dms/lettsup.html)

● Florida Tomatoes Proposed Food Safety Audit -Tomato Farms and Greenhouses  
[www.floridatomatoes.org/PROPOSED%20Audit%20-%20Farms%20and%20Greenhouses.PDF](http://www.floridatomatoes.org/PROPOSED%20Audit%20-%20Farms%20and%20Greenhouses.PDF)

● Florida Tomatoes Proposed Food Safety Audit -Tomato Packinghouses  
[www.floridatomatoes.org/PROPOSED%20Audit%20-%20Packinghouses.PDF](http://www.floridatomatoes.org/PROPOSED%20Audit%20-%20Packinghouses.PDF)

## Upcoming Events

**Sustainable Agriculture: From Farmer to Entrepreneur Seminar**, 8:30 AM– 4:00 PM, April 29, 2008, Montgomery County Extension Office, 1030-A Cumberland Heights Rd., Clarksville, TN  
*This workshop will focus on sustainable agriculture concepts, marketing, value-added ideas and other issues to enhance economic development for the region and provide education to entrepreneurs. The cost is \$15/person to cover lunch and take-home materials. Pre-registration recommended by April 21. For more information, contact Karla Kean (kkean@utk.edu) or Jerri Lynn Sims (jsims4@utk.edu) at 931.648.5725.*

**8th Annual NCSU Worm Farming Conference**, May 19-20, 2008, Raleigh, NC  
*A conference about worm farming and vermicomposting taught by industry experts. This conference is great for beginners or seasoned worm farm operators. For more information, visit: [www.bae.ncsu.edu/workshops/worms08/](http://www.bae.ncsu.edu/workshops/worms08/).*

**Developing & Implementing HACCP for the Fresh-cut Industry**, May 20-22, 2008, Extension Food Science Teaching Facility, University of Georgia Campus, Athens, GA  
*This program has been specifically designed for the fresh-cut industry. The goal of this program is to provide you with the skills and knowledge to design, implement, document and maintain HACCP in your fresh-cut business. For more information and to pre-register, visit: <http://www2.unitedfresh.org/forms/MeetingCalendar/>.*

**Domestic Kitchen Tennessee Food Safety Certification Course**, 8:30 AM-3:30 PM CST, May 29, 2008, Central Region Extension Office, 5201 Marchant Dr., Nashville, TN  
*This course meets the requirements for the Rules of the Tennessee Dept. of Agriculture Regulatory Services Division, Regulations for Establishments Utilizing Domestic Kitchen Facilities for Bakery and Other Non-Potentially Hazardous Foods Intended for Sale. The fee for the course is \$100 and includes instruction materials, lunch and certificates earned. Pre-registration mandatory. For further information, please contact Nancy Austin at 865.974.7717 or [naustin@utk.edu](mailto:naustin@utk.edu) or register on-line at [www.wcmorris.com](http://www.wcmorris.com).*

**United Fresh Produce Associations' Produce Inspection Training Program**, June 2-6, 2008, Fredericksburg, VA.  
*This program will provide hands-on instruction from USDA experts to anyone involved in the produce supply chain - grower to retailer. Become more knowledgeable about quality control standards, inspection grading, USDA produce procedures and requirements, and more! For details, contact Beth Berman at 202.303.3405 or visit [www.unitedfresh.org](http://www.unitedfresh.org).*

**TSU Small farm Expo/Small Farmer Recognition Program**, August 8, 2008, Ashland City, TN  
*More details to follow...*

**2008 University of Tennessee Research and Education Center Field Days:**  
(For more information on any of these events, visit <http://taes.tennessee.edu/dynaminevents.asp>.)

**Beef and Forage Field Day**, June 12, 2008, East TN Research and Education Center, Knoxville, TN

**Fruits of the Backyard Field Day**, June 17, 2008, Middle TN Research and Education Center, Spring Hill, TN

**Tobacco, Beef and More Field Day**, June 26, 2008, Highland Rim Research and Education Center, Springfield, TN

**Blooms Days**, June 28-29, 2008, University of Tennessee Gardens, Knoxville, TN

**Summer Celebration**, July 10, 2008, West TN Research and Education Center, Jackson, TN

**Tobacco and Forage Production Field Day**, July 17, 2008, Research and Education Center at Greeneville, Greeneville, TN

**25th Milan No-Till Field Day**, July 24, 2008, Research and Education Center at Milan, Milan, TN

**Steak and Potatoes Field Day**, August 5, 2008, Plateau Research and Education Center, Crossville, TN

### **SPROUTS**: Supporting Producers through Research and Outreach at UT

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences and resource development. University of Tennessee Institute of Agriculture, United States Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.

ANNETTE WSZELAKI  
COMMERCIAL  
VEGETABLE EXTENSION  
SPECIALIST

The University of Tennessee  
Department of Plant Sciences  
252 Ellington Plant Sciences  
2431 Joe Johnson Dr.  
Knoxville, TN 37996-4561

Phone: 865.974.7208

Fax: 865.974.1947

E-mail: [annettew@utk.edu](mailto:annettew@utk.edu)

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