

Virginia Tech Fresh Produce Food Safety Efforts

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Virginia Fresh Produce – 2007 Data

- 1,562 fresh market vegetable farms
 - Harvested acreage
 - Up to 1 acre = 26%
 - 1 to 4.9 acres = 44%
 - 5 to 14.9 acres = 15.7%
- Market Value
 - Vegetables, melons, potatoes, etc: \$94 million
 - Fruits, tree nuts, and berries: \$68 million



USDA Ag. Census

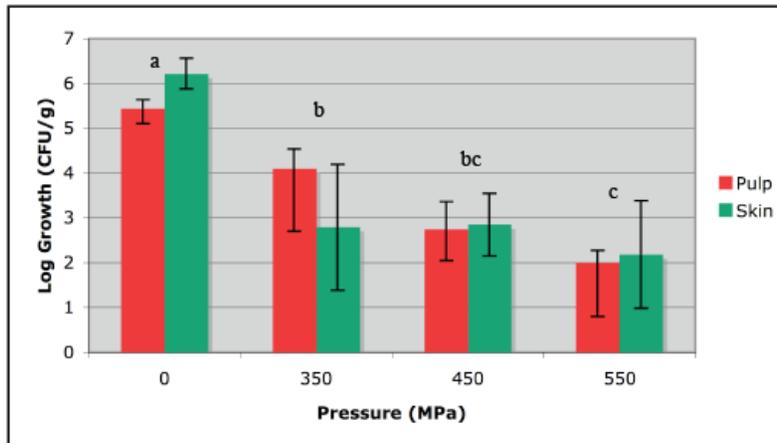
Spinach Microbial Community

- Characterization of the microbial community of spinach and antagonism against *E. coli* O157:H7
 - Cultivar, field conditions, post-harvest handling
 - Parallel pyrosequencing of 16s rRNA
 - Results:
 - 600 taxonomic units; 11 phyla
 - Culturing methods
 - Results:
 - 11 genera, 16 species antagonistic against *E. coli* O157:H7
 - *Paenibacillus polymyxa* and *Pseudomonas espejiana*, were found to secrete a non-protease antagonistic compound.



HPP of Tomatoes

- High Pressure Processing to reduce *Salmonella* in whole and diced tomatoes
 - 80,000 psi; 120 seconds; 20°C
 - 3.7 log reduction in diced tomatoes
 - 3.4 log reduction in whole tomatoes

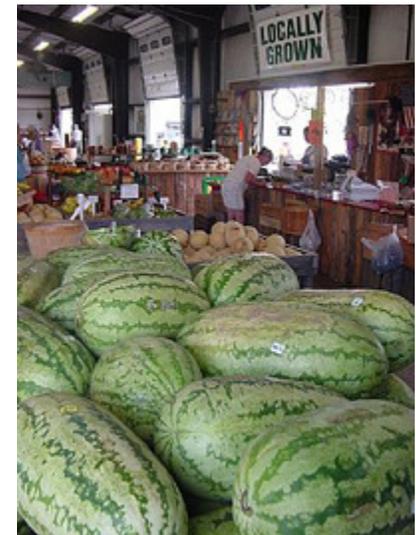


Salmonella Braenderup in whole tomatoes following HPP (350, 450, 550 MPa) for 120 seconds at 20°C.



Farm and Market Practices Survey

- NIFSI Grant (UGA/Clemson/VT):
 - Development, Implementation And Evaluation Of Food Safety Practices For Produce Destined For Locally Grown Marketplaces
 - Surveys (years 1 and 3)
 - Small Farmers
 - Farm Market Managers
 - Trainings (year 2)



Survey Tool: Farmers

- 350 farmers in three states will be surveyed
- 23 Questions related to:
 - Type and frequency of manure use
 - Water use
 - Harvesting practices
 - Produce washing practices
 - Worker training and hygiene
 - Transport to market



Survey Tool: Market Managers

- 100 market managers in three states will be surveyed
- 23 Questions related to:
 - Food safety standards at the market
 - Requirements placed on farmers
 - Sanitation at the market
 - On site food preparation and sampling
 - Market inspections



Preliminary Results: Farmers

- 50% use manure during production
- Primarily use well or municipal water
- 50% used a sanitizer on contact surfaces
- 80% maintained restroom/handwashing facilities
- 50% had trained workers in sanitation
- 100% indicated interest in training materials

Preliminary Results: Market Managers

- Most don't ask farmers about their food safety standards
 - Manure use
 - Water use
 - Animal exclusion
 - Worker hygiene



Extension: A History of GAPs Training in VA

- 1999 – 2001: Preliminary GAPs Instruction
 - Grower response: lukewarm
- 2002 – 2005: Agent training and program development
 - Trained agents lost to budget pressures, etc.
 - Grower response: increased interest; low commitment
- 2005 – 2008: Large audience meetings
 - Grower response: increased interest; increased commitment
- 2008 – 2010: Agent leadership and grower assistance
 - A few agents have developed strong programming
 - Growers interested and committed

**USDA Agricultural Marketing Service
GAP/GHP Audit Verification Program
Virginia**

The following table shows companies that have successfully passed an initial audit under the voluntary Good Agricultural Practices & Good Handling Practices for the scopes and commodities shown. Dates in a particular column indicate that the participant demonstrated an acceptable level of adherence with the Food and Drug Administration's "Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables." The audit results are valid for one (1) year from the date shown, and are validated through the use of unannounced audit(s) throughout the growing/packing season. "N/A" means that process was not audited.

Company	Address	City, State	Farm Review Part 1	Field Harvest Packing Part 2	House Packing Part 3	Storage & Transportation Part 4	Traceback Part 5	Wholesale Distribution Center / Terminal Warehouses Part 6	Traceback A Part 6A	Commodities Covered by Audit
September 2009										
C&E Farms Inc	PO Box 315	Cheriton, VA	n/a	n/a	9/23/2009	9/23/2009	9/23/2009	n/a	n/a	Snap Beans
Flippen-Seaman Inc	5529 Crabtree Falls Highway	Tyro, VA	9/28/2009	9/28/2009	9/28/2009	9/28/2009	9/28/2009	n/a	n/a	Apples
Timber Ridge Fruit Farm, LLC	311 Muse Road	Gore, VA	9/18/2009	9/18/2009	9/17/2009	9/17/2009	9/17/2009	n/a	n/a	Apples
October 2009										
Crown Orchard Co LLP	5861 Piedmont Apple Lane	Covesville, VA	10/19/2009	10/19/2009	10/19/2009	10/19/2009	10/19/2009	n/a	n/a	Apples, Peaches, Nectarines, Cherries
November 2009										
Andrews Farming Co. LLC	226 Autumn Leaf Lane	Galax, VA	n/a	n/a	n/a	n/a	n/a	11/18/2009	n/a	Apples, Cabbage, Onions, Pumpkins, Watermelons
River Farm VA LLC	17518 Nanzatico	King George, VA	n/a	n/a	11/5/2009	n/a	n/a	n/a	n/a	Spinach
January 2010										
Bowman Fruit Sales, LLC	17581 Mechanicsville Road	Timberville, VA	n/a	n/a	1/25/2010	1/25/2010	n/a	n/a	n/a	Apples

Company	Address	City, State	Farm Review Part 1	Field Harvest Packing Part 2	House Packing Part 3	Storage & Transportation Part 4	Traceback Part 5	Wholesale Distribution Center / Terminal Warehouses Part 6	Traceback A Part 6A	Commodities Covered by Audit
Fitzgerald's Orchards	728 Harper's Creek La	Tyro, Va	1/11/2010	11/3/2009	12/2/2009	12/2/2009	n/a	n/a	n/a	Apples
Military Produce Group	1106 Ingleside Road	Norfolk, VA	n/a	n/a	n/a	n/a	n/a	1/27/2009	n/a	Fruits and Vegetables
Woods Produce Company Inc	131 Cherry Creek Road	Meadows of Dan, VA	n/a	n/a	n/a	1/13/2010	n/a	1/13/2010	n/a	Fruits and Vegetables
Virginia Produce Co.	PO Box 40	Hillsville, Va	n/a	n/a	n/a	n/a	n/a	1/12/2010	n/a	Various Fruits and Vegetables
July 2010										
Timber Ridge Fruit Farm, LLC	311 Muse Road	Gore, VA	7/1/2010	7/1/2010	n/a	n/a	n/a	n/a	n/a	Apples, Peaches
Dublin Farms, Inc.	PO Box 310	Homtown, VA	7/13/2010	7/13/2010	7/13/2010	7/13/2010	n/a	n/a	n/a	Potatoes

Current Extension Efforts

- **Shenandoah Valley Produce Auction**
 - Open April through October (Tuesdays and Fridays)
 - Consignments from 400 different sources in 2009
 - Training conducted in cooperation with local agents
 - “Several” growers nearly compliant with GAPs
 - Few certifications
 - Reasons for not being certified:
 - Audit cost
 - Spreading improvements over time

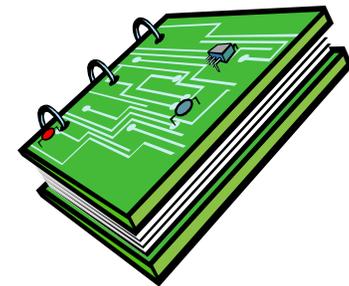


- **Southwest Virginia Efforts**

- Led by Virginia Cooperative Extension agents
- Training of local growers in group sessions
- Focused assistance to growers seeking certification
 - 7 growers recently certified in one or more GAPs areas
 - 5 additional growers to be audited this fall

- Development of a Plan of Action Manual

- Serves a guide to writing GAPs plan
- Made available to growers



- Future directions

- Increased role as liaison between auditors and growers

- **Farm-to-School Programs**

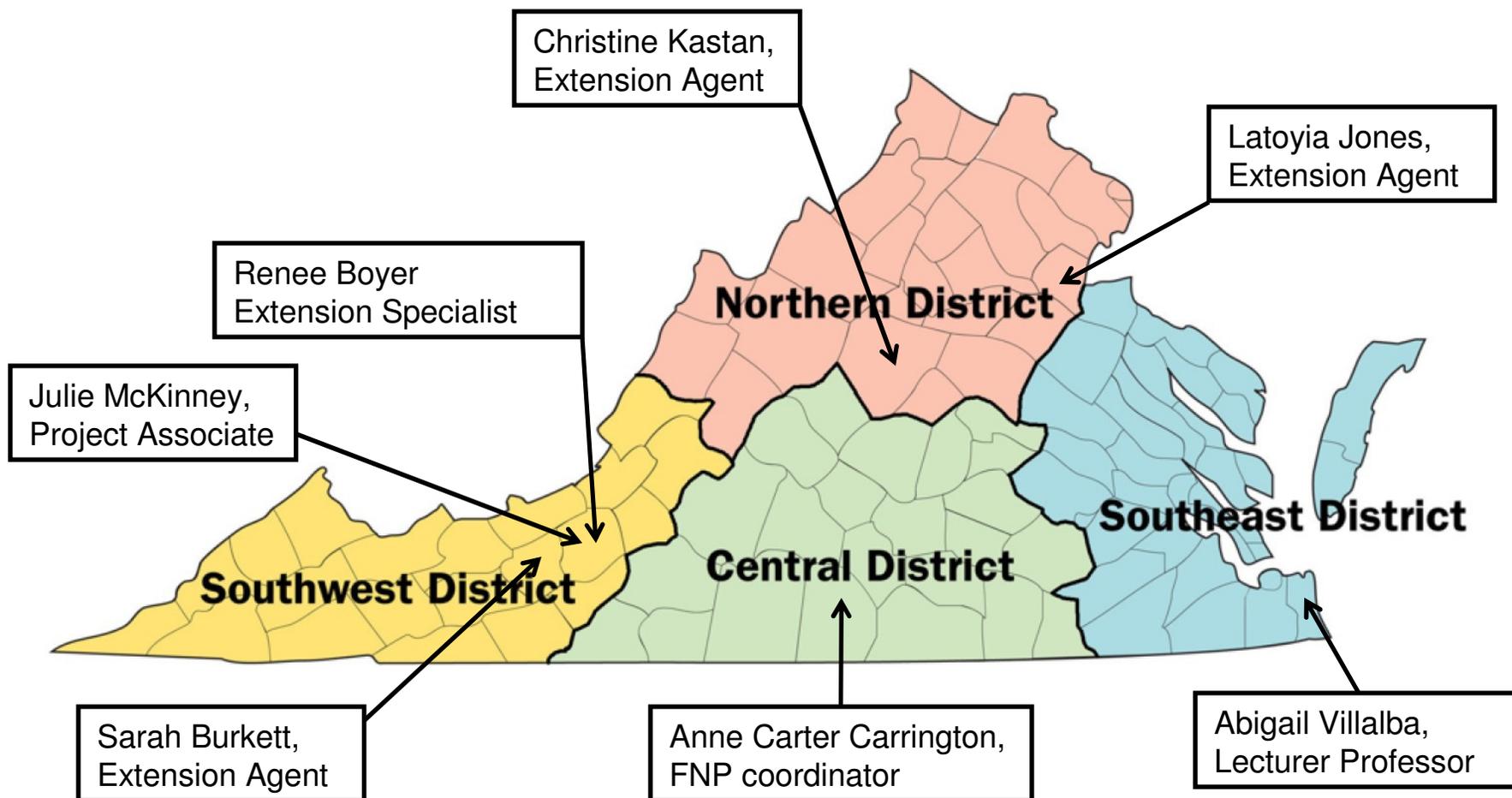
- Increased interest in purchasing local produce
- Food safety concerns
- Requests for training have increased

- **Cooperation with VA Dept of Ag.**

- Joint training
- Principles and practices (Va Tech)
- Audit process (VDACS)



Virginia's Food Safety Team:



VA Food Safety Team Efforts

- The team of experts covering Consumer and Retail Food Safety across the state
 - ServSafe™
 - Cooking for Crowds
 - Home Food Preservation
 - Farmers Market Food Safety Efforts (along w/ ANR)



Farmers Market Food Safety:

- 100 farmers markets across VA and growing.....
- Extension role:
 - ANR and FCS agents support food safety programs
 - Targeted towards vendors
 - Pressure canner testing
 - Food preservation
 - Short (1-2hr) basic food safety presentations
 - **GAPs**



Current Teaching Efforts

Online Master's Degree Program

 **College of Agriculture and Life Sciences**
Online Master's of Agricultural & Life Sciences

- Home
- About the Program
- Answers to Your Questions
- Online Learning
- How to Apply
- Courses
- Meet the Faculty
- Talk to Us
 - What Courses Do You Want?
 - Contact Us

Agricultural and Life Sciences Online Graduate Degree Program

The College of Agriculture and Life Sciences has developed a Master's of Agricultural and Life Sciences degree program that is offered entirely online. The program was begun Fall 2007 and some of our first generation of students are expected to complete the program Fall 2009.

Why is This a Great Idea for Me?

- You can learn new skills and get a Master's degree while you work.
- Take as many or as few courses as you want - slow or fast, it's up to you.
- Pick the subject area you like and become an expert in it
- Create new job opportunities for yourself based on your skills learned in unique and innovative courses
- If you do not get an online Master's degree now, will you always wish that you had?



Interview about the program. Courtesy of WVPT Public Television.

About the Program

Learn about the courses, transfer credits and how long it takes to complete the program. Listen to an overview of the program by director, Dr. Doug Pfeiffer.

Answers to Your Questions

Find answers to questions most frequently asked about the program. Ask a question if you cannot find an answer.

About Online Learning

Don't know about online learning? Find out more.

<http://www.online.cals.vt.edu/masters/>

- Courses for the program are divided into five different concentrations:
 - Biosecurity, Bioregulations, and Public Health
 - Education
 - Environmental Science
 - **Food Safety** 
 - Plant Science and Pest Management
- Food Safety Students
 - 10 currently in concentration
 - Varied education and experience
 - Most working in food industry
 - Two in education (secondary)

Food Safety		
Course	Credits	Semesters Offered
<u>FST 5034</u> : Good Agricultural and Manufacturing Practices	3	Spring (even years)
<u>FST 5044</u> : Global Food Laws and Regulations	3	Fall (even years)
<u>FST 5614</u> : Food Safety and Security	3	Spring (odd years)
<u>FST 5624</u> : Applied Food Microbiology and Sanitation	3	Fall (odd years)

FST 5034
Good Agricultural and Manufacturing Practices

CRN: 17736 - Spring 2010

Module	Topic
1	Introduction to the Course
2	Good Agricultural Practices Overview
3	GAPs: Field Preparation, Manure and Compost
4	GAPs: Agricultural Water – Sources and Protection
5	GAPs: Pest Animal Exclusion and Harvest Practices
6	GAPs: Worker Hygiene and Health
7	GAPs: Post-Harvest Handling and Transportation
8	Current Good Manufacturing Practice Overview
9	cGMPs: Personnel; Processing Plant and Grounds; Sanitary Operations, Facilities, and Control
10	cGMPs: Equipment and Utensils; Warehousing and Distribution
11	GAPs and GMPs: Course Summary

Future Directions in GAPs Training in VA

- Support agents who work with growers/handlers
- Development of practical materials to support fresh produce food safety plans
- Continue bringing latest science to growers and handlers
- Watch federal regulation closely
- Continued growth of online Master's degree program