

## Good Agricultural Practices (GAPs)

### What are GAPs?

Good Agricultural Practices, or GAPs, are production and post-harvest guidelines designed to reduce the risk of food-borne human disease contamination on fresh produce. These voluntary procedures can be tailored to any production system. GAPs recommendations are directed toward the primary sources of contamination: soil, water, hands, and surfaces.

### Why are GAPs needed?

GAPs were developed in response to the increase in the number of outbreaks of food-borne diseases on fresh produce. These incidences have doubled in the U.S. since 1987. While most consumers associate food-borne diseases with improperly stored or poorly cooked animal products, it is clear that contaminated fruits and vegetables can also present a risk.

Produce can become contaminated by any of a number of microbial contaminants (bacteria, viruses, parasites or fungi) at any stage of production, processing, packaging or marketing. While the cooking process would normally kill these microorganisms, fresh produce is often consumed raw. Research shows that the detection of residual pathogens prior to marketing is extremely difficult. Similarly, it is very hard to sanitize produce so that it is completely free of harmful microorganisms. The most effective strategy for



reducing the risk of contamination is through prevention. GAPs provides simple steps that fruit and vegetable growers can implement to greatly reduce the potential for contamination on the farm.

Consumer and retail concerns are understandable when these illnesses make front page news. Tainted foods are bad for business, both for the producer and for the marketer. Not only can serious financial losses result, but contaminated foods also hurt consumer confidence. Growers who are able to provide assurances that their products are safe will have a marketing advantage. While there have not been any contamination outbreaks associated with Kentucky produce, a partnership of the Kentucky Department of Agriculture, the University of Kentucky Cooperative Extension, and the Department of Public Health is taking a proactive approach by developing and promoting the GAPs program.



GAPs is one way to help maintain the trust that currently exists between local growers, markets and the consumer.

### **What is the Kentucky GAPs Program and how does it work?**

The Kentucky GAPs partners have developed a training-for-trainers program that will provide county agents with the information they need to train their producers. Growers participating in the three-hour producer training sessions will be issued a Kentucky Department of Agriculture (KDA) certificate indicating completion of the course. In addition, participants will be offered self-assessment kits which will assist them in evaluating their own production system against GAPs procedures. The kit's accompanying farm plan worksheet provides space for farmers to identify areas of risk, to develop their own strategy for taking corrective action, and to establish a timetable for making these changes. These self-audit materials are also available through the KDA, online at the KDA Web site, and from participating county Extension offices. Along with resource information, the KDA Web site provides contact information and offers program updates.

This program is currently voluntary, but many in agriculture envision a time in the near future when marketplaces will demand compliance with GAPs procedures, at least at some level. Some farmers markets in other states have already begun requiring that growers observe GAPs as a prerequisite for membership.

### **What are the basics of the GAPs Program?**

The specific GAPs steps are outlined in detail in the "Good Agricultural Practices Self Audit Workbook" developed by Cornell University. GAPs principles can be summarized as follows: clean soil, clean water, clean hands, and clean surfaces. Examples of applicable procedures are listed below. These principles must be applied to each phase of production (field selection, pre-

plant field preparations, production, harvest, and post-harvest) to be effective.

**"Clean soil"** involves taking steps to reduce the possibility of introducing microbial contaminants into the soil, particularly via manure and other animal excrements. GAPs address the need to properly compost, apply and store manure. Additionally, the exclusion of domesticated animals from production fields is essential in helping to reduce the possibility of fecal contamination. Taking steps to minimize the presence of wild animals in fields is also important.

**"Clean water"** entails making sure all water used in washing, cooling and processing is of drinkable quality. Packing ice should also be made from drinkable water. Ground and surface water sources need to be protected from runoff and animal contamination. Water used for irrigation and foliar applications also needs to be free of human pathogens. Regular water quality testing may be necessary, particularly for surface water sources.

**"Clean hands"** applies to workers and the use of good personal hygiene in the field and packing house. Providing washing facilities for customers at U-Pick operations is also an important consideration.

**"Clean surfaces"** means ensuring that all packing bins, work surfaces, storage areas, and transportation vehicles are properly washed and sanitized on a regular, often daily, basis. Farm equipment should also be routinely cleaned and sanitized.

An essential aspect of GAPs procedures is accurate record keeping. While keeping records is an important part of any farm operation, it can become critical in cases of food safety issues. When food-borne illnesses do occur, attempts are made to trace the contamination back to the point of origin. Growers who document their GAPs procedures will be able to provide evidence that their farm is an unlikely source of the outbreak.

## How much does GAPs cost?

The GAPs training materials and courses are free to Kentucky farmers. The costs in terms of implementing GAPs will vary from farm to farm. Some growers are probably already following some or many of the GAPs protocols. Others will need to make a number of changes to comply with the guidelines. Food safety requires a higher level of care and management – all of which can be costly. However, food contamination that leads to an outbreak of human illness can be even more costly in terms of dollars, loss of markets and ruined reputation.

## More Information

### General

- Food Safety Begins on the Farm: A Grower's Guide to Good Agricultural Practices for Fresh Fruits and Vegetables (Cornell University)  
[http://www.wcmorris.com/gap/files/cornell\\_guide.pdf](http://www.wcmorris.com/gap/files/cornell_guide.pdf)
- Good Agricultural Practices: A Self-Audit for Growers and Handlers (Cornell University)  
<http://www.kyagr.com/marketing/documents/selfaudit.pdf>
- Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables (USDA Food and Drug Administration, 1998)  
<http://www.cfsan.fda.gov/~dms/prodguid.html>
- Reduce Microbial Contamination with Good Agricultural Practices (Cornell University, 2000)  
<http://www.hort.cornell.edu/department/faculty/rangarajan/veggie/Foodsafety/foodsafety.htm>

### Crop-specific

- Good Agricultural Practices for the Production and Handling of Cabbage and Leafy Greens (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/cabbage.pdf>
- Good Agricultural Practices for the Production and Handling of Cucumbers, Eggplant, Squash, Peppers and Sweet Corn (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/Cucumber.pdf>

- Good Agricultural Practices for the Production and Handling of Green Beans and Peas (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/beans.pdf>
- Good Agricultural Practices for the Production and Handling of Melons (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/melons.pdf>
- Good Agricultural Practices for the Production and Handling of Peaches (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/Peaches.pdf>
- Good Agricultural Practices for the Production and Handling of Tomatoes (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/tomato1.pdf>
- Good Agricultural Practices for the Production and Handling of Strawberry, Raspberry, Blackberry and Blueberry (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/berries.pdf>
- Good Agricultural Practices for the Production and Handling of Sweet Potato, Carrots and Root Crops (USDA and North Carolina State University, 2002)  
<http://www.kyagr.com/marketing/documents/carrots.pdf>

### Web sites

- Kentucky Good Agricultural Practices (GAP) Program (Kentucky Department of Agriculture)  
<http://www.kyagr.com/marketing/GAP.htm>
- GAPsNET: National GAPs Network for Education and Training (Cornell University)  
<http://www.gaps.cornell.edu/index.html>

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