Crop Report

It’s been a nice week to get out and plant! Planting in the field continues for some cool season crops and is starting in some areas for the warm season crops—tomatoes, peppers, eggplants, okra, and sweet potatoes. Seeding in the greenhouse also continues. Last week, a couple of vegetables got neglected in the discussion of freeze damage—rhubarb and asparagus. "Rhubarb should not be harvested when the leaves are wilted and limp after a hard freeze," warns Elizabeth Wahle, University of Illinois Extension horticulture specialist. "Not only do the leafstalks acquire a poor flavor and texture, but the leaves and eventually the stem may become toxic."

Rhubarb leaves should never be eaten, and petioles (the part you eat) should be harvested ONLY from plants that have suffered no frost damage. Rhubarb leaves contain oxalic acid, a toxic substance that may move into the petioles after frost damage. When consumed, the oxalic acid can crystallize in the kidneys and cause permanent damage to the organs. All petioles that have been exposed to freezing temperatures should be removed and discarded. The re-growth is safe to eat. As normal harvest begins, always leave at least one-third of the petioles unharvested to sustain the plant. Asparagus is safe to eat, though it may have suffered tip damage and softening due to the cold.


What’s new?

At the end of March, the FDA released their final report on the causes of the E. coli O157:H7 outbreak in bagged spinach last September that resulted in over 200 illnesses and 3 deaths in 26 states. This report identifies the potential risk factors on the farms where the spinach was grown that may have led to the outbreak, but exactly how the contamination started remains a mystery.

Using the product codes on the bags, and employing DNA fingerprinting on the bacteria from the bags, the investigators matched samples of E. coli O157:H7 from one field to the strain that caused the outbreak. Potential environmental risk factors for the E. coli O157:H7 contamination included the presence of animals (cattle, deer, birds, wild pigs) in or near the field, fecal contaminated river or pond water used for irrigation, and workers with contaminated footwear or clothing harvesting the spinach. Because the contamination occurred before the start of the investigation, and because of the many ways that E. coli O157:H7 can be transferred - animals, humans, and water - the precise way the bacteria spread to the spinach remains unknown.

Use of Good Agricultural Practices make the risk of such outbreaks "markedly lower," but it doesn’t rule out future outbreaks, says Kevin Reilly, California’s Department of Health Services. "Is it 100% preventative? No. Nothing is 100%," he says, calling for good agricultural practices to be used “every day, on every farm.” A single breakdown in those practices could lead to another outbreak.

A food safety outbreak is something nobody ever wants to come from their farm, to reduce the risk, visit Cornell University’s website on Good Agricultural Practices (GAPs), with resources for on farm training in both English and Spanish: http://www.gaps.cornell.edu/educationalmaterials.html. On this site you will also find a checklist of GAPs for the farm from pre-plant through post-harvest handling: http://www.gaps.cornell.edu/Educationalmaterials/Samples/PamphletEng.pdf.

Excerpts from “E. coli Spinach Outbreak Hard to Trace” by Miranda Hitti and “FDA Finalizes Report on 2006 Spinach Outbreak” by Michael Hemdon.
The “Baby” Leafy Greens Craze

In keeping with the bagged spinach theme of this newsletter, let’s take a look at a good reason you might want to eat your greens.

Consumption of leafy green vegetables has doubled in the last few years. This increase goes hand-in-hand with greater consumer awareness of the health properties of fresh greens. A large portion of this salad market includes “baby” or immature leafy greens. The sales of “baby” spinach increased by over 70% from 2002 to 2003. Baby greens, and pre-packaged salad mixes, are now mainstays in the foodservice market. Consumer popularity of the packaged “baby” greens is undoubtedly connected to convenience and taste. The immature leaves of the “baby” greens have a delicate texture and sweet flavor. But, just how nutritious are the “baby” greens compared to their older, more mature siblings?

Because of the popularity of “baby” greens in the salad market in the U.S., it would be helpful if consumers knew the nutritional differences between “baby” greens and mature produce. Very little information is available on the nutritional values of “baby” greens beyond the mandatory labeling of fats, sodium, carbohydrates, fiber, etc. Leafy vegetables are a great source of phytonutrient compounds, especially beneficial carotenoids.

Carotenoids are powerful antioxidants only produced in plants. With the leafy greens, the darker the leaf color, the greater the carotenoids provided. There are two scientific studies that shed light on the nutritional debate over “baby” greens in terms of carotenoid phytonutrients. Both studies draw the same conclusions. In separate Brazilian and U.S. studies, immature or “baby” greens had lower carotenoid concentrations than mature or older leaves of kale. The lower carotenoid concentrations were attributed to the lack of maturity of the leaves, and the lack of development of the biochemical processes where carotenoids function best. The take home message is that for greater convenience, softer texture, and sweeter flavor, your best bet is the packaged “baby” leafy greens. But, if you want to maximize the nutritional punch associated with the leafy greens, select mature spinach, kale, and Romaine lettuces to ensure that you are getting the highest levels of carotenoids in your salad bowl.

By Dr. Dean Kopsell


On the Farm: Season Extension

There are many ways to extend your growing season; one that has gained popularity in recent years is the use of high tunnels. The appeal of high tunnels comes from their low cost and simplicity. Unlike greenhouses, most high tunnels are not heated and do not have electricity, yet they still can add weeks to months onto your growing season. Also, they can enhance crop quality, growth and yield. In fact, in 3,000 sq. ft. of high tunnel space, you can grow nearly as much as on an acre of land, says Lewis Jett, vegetable specialist with University of Missouri Extension. He is helping folks like David and Marylin Reckamp, hog producers from Missouri, diversify into vegetables and small fruits. The Reckamps’ first tomatoes are ready to pick in early June. They sell their produce at a premium because they are not competing with the larger, later producers who supply grocery chains. They also have a loyal, local customer base who enjoy trips out to the farm.

One crop can typically pay for the structure, so the risk involved is low, Jett says. “It’s also easy to scale up, and it lets you spread out your labor more than you would with field vegetables.” Tomatoes are the highest-value crop in high tunnels, with typical yields of 20 to 30 lbs. per plant. That’s about 4 times the yield of field tomatoes. And the potential is there for 50 to 60 lbs./sq. ft., Jett says.

Wisdom to pass along

Water level was an issue for the Reckamps early on. Flooding led them to build up the soil level inside their high tunnels. Now there is a 6-in. step up from the ground outside. Getting plastic covers onto the hoops also was a challenge. “Don’t do this on a windy day,” Marylin says. Typically, the plastic covers on the structures last 4-6 years before they need replacing. The frames will hold up for about 12 years, Jett says.

The Reckamps now grow a long list of crops: strawberries, 12 varieties of tomatoes, okra, green beans, peas, 8 types of peppers, 3 types of Irish potatoes, asparagus, cantaloupe, broccoli, and sweet corn.

High tunnel tomatoes. Photo by Greg Grieco.

Photo by Greg Grieco.

Photo credit: http://www.dole.com/
Question of the Week

Q: What prevents local produce from being contaminated if farmers and gardeners use raw and/or composted cow manure plus, what other four-footed animal manure is usable?

A: Due to the importance and timeliness of this question, we will go into more depth on this answer than we do with some of our more straightforward questions of the week. The USDA regulates the use of animal manures and composts in the production of crops for human consumption. These regulations were created to minimize (not prevent!) food safety risks. They stipulate that raw manure must be:

1) composted prior to use, OR
2) applied to land used for a crop not for human consumption, OR
3) incorporated 120 days or more before the harvest of crops whose edible portion has direct contact with the soil surface, OR
4) incorporated 90 days or more (more is better!) before the harvest of crops whose edible portion does not have direct contact with the soil surface.

Furthermore, composting of plant and animal products must be done in such a way as to establish a carbon: nitrogen ratio between 25:1 and 40:1 and maintained at a temperature between 131° F and 170° F for 3 days using an in-vessel or static aerated pile system OR maintained at a temperature between 131° F and 170° F for 15 days using a wind-row composting system, during which period, the material must be turned a minimum of five times. These regulations were put in place, as data suggests the pathogens cannot survive these temperature and/or time regimes. Problems arise when proper composting procedures or manure application times are not followed. For example, ‘dried’ manure (manure that might have been sitting in the field or barn a while) may still contain dormant pathogens that require only a source of moisture to become infective again, depending on the drying temperature and procedure. Further problems can develop from unauthorized additions of 4-legged manures, such as deer, raccoons, skunks, groundhogs, dogs, cats, and other wildlife. Keeping wildlife out of growing fields is becoming increasingly important, yet difficult. Birds are another issue, as they can carry contaminants and are much harder to control. I’ve yet to see a field where they could keep the birds from flying over!

Irrigation water is another source of potential contamination. It is important to know the source of your water and its potential for contamination, and to have it tested regularly to ensure its usability and safety. Animal manure can contaminate water sources, so that even the most stringent composting and application timing of manure and compost can be undone by contaminated water. For acceptable forms of manure to use, all of the traditional crop animal manures (cow, pig, horse, chicken, sheep, etc.) are used, each contributing unique nutrient properties. For example, chicken manure is a concentrated and rapidly available nitrogen source, thus, care must be taken not to burn young seedlings. Horse manure has less nitrogen and phosphorous than other manures, but also has the most weed seeds, so it is a good candidate for composting to reduce or eliminate the possibility of those weed seeds germinating.

No matter what the type of manure, the most important thing to remember is to apply it with plenty of time before the crop harvest and/or properly compost any type of manure that may be used. Despite these rules and restrictions, composts and manures are a valuable source of soil fertility, not only from the standpoint of adding NPK, but also contributing to overall soil health (organic matter, microbial communities, tilth, etc.). Their benefits should not be overshadowed by recent isolated, though tragic, incidents in the vegetable industry.

For more information on the USDA rule, visit: [http://www.ams.usda.gov/NOP/NOPStandards/ProdHandReg.html](http://www.ams.usda.gov/NOP/NOPStandards/ProdHandReg.html).

For more information on manure and compost, visit:

- “Using Manure and Compost as Nutrient Sources for Fruit and Vegetable Crops” By Carl J. Rosen and Peter M. Bierman, Department of Soil, Water, and Climate, University of Minnesota [http://www.extension.umn.edu/distribution/horticulture/M1192.html](http://www.extension.umn.edu/distribution/horticulture/M1192.html)
- “On Farm Composting of Poultry Litter” By Forbes Walker, Department of Biosystems Engineering and Soil Science, University of Tennessee [http://www.utextension.utk.edu/publications/infosheets/Pss319/PSS319InProgress.htm](http://www.utextension.utk.edu/publications/infosheets/Pss319/PSS319InProgress.htm)

If you have a question, send it to: awszelak@utk.edu.

Some old party hen cornered Bess at some party, and said, "Mrs. Truman, isn't there anything you can do to get the President to stop using the word 'manure'?

And Bess replied, "It took me 40 years to get him to use that word!"

- Harry Truman
Weather Report

Well, it looks like a bit of stormy weather is predicted for the next day or so. While we could use some rain, we never want too much of a good thing. After the storms, it looks like the rest of the 7-day forecast is partly cloudy for most of the state, with a clear sunny day thrown in here and there. Temperatures across the state will range from about 70 to 80 degrees for the high, with lows ranging from about 50 to 60 degrees.

In the ‘Fruit Pest News’ this week, Dr. Steve Bost warns tomato growers to pay attention to the spring weather, as it can have a bearing on tomato spotted wilt in the summer. For the full story, visit: http://web.utk.edu/~extepp/fpn/fpn042407.htm.

Upcoming Events

Whole Foods Local Grower and Producer Summit, April 30, 2007, Warner Park Nature Center, Nashville This is a marketing opportunity for all TN growers. Contact your county extension agent for more information.

United Fresh Marketplace, United Fresh Produce Association, May 5 - 8, 2007, Chicago, IL For more information visit www.freshmarketplace.org.


North Carolina Potato Association Annual Meeting, May 21, 2007, Elizabeth City, NC For details, email Tommy.Fleetwood@ncmail.net.

Tennessee Agritourism Association Meeting, June 11, 2007, Amazin’ Acres, Sparta Contact Vera Ann Myers for more information at verann@xtn.net.

Blooms Days Garden Festival and Marketplace, June 23 - 24, 2007, East Tennessee Research and Education Center, Knoxville

Tobacco, Beef and More, June 28, 2007, Highland Rim Research and Education Center, Springfield

Summer Celebration, July 12, 2007, West Tennessee Research and Education Center, Jackson


Steak and Potatoes Field Day, August 7, 2007, Plateau Research and Education Center, Crossville

International Irrigation Show, December 9-11, 2007, San Diego, CA For details, call 703.536.7080 or visit http://www.irrigation.org.

Tennessee Fruit and Vegetable Association Convention, December 9-11, 2007, Nashville Airport Marriott

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.