# Sustainable Agriculture at UGA

Looking forward for this generation and the next...




## Summer 2013

Rain, rain, go away. We are about as wet and muddy here as I have ever seen it. While it has been great to recharge from the years of drought, the unusual weather has impacted planting, harvest, and particularly crop diseases.

We were very disappointed to have to cancel the Organic Twilight Tour. The Horticulture Farm received 4 inches of rain on top of very wet soils the day before the tour. We were afraid we would all be sunk up to our knees in mud and there was no suitable place for parking, so we had no choice but to cancel. Because we time many things to peak for the tour, we will not be able to reschedule for this summer.

We have a lot of information for you in this newsletter – pollinators, food safety, and the results of the vegetable survey conducted this winter. As always, let us know what think and if you have ideas on information you would like to see.

Wishing you a good summer and hopefully some sun!

*Julia Gaskin*
*Sustainable Agriculture Coordinator*
*Crop and Soil Sciences Department*
*University of Georgia*

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### Upcoming Events

*August 2-4:* 5th Annual Florida Small Farms and Alternative Enterprises Conference
*September 11:* Seeds of Growth Conference
*September 24-25:* Starting a New Food Business in Georgia Workshop
*October 15-17:* Sunbelt Ag Expo

Find more information on these events at www.SustainAgGa.org

Also find basic principles of sustainable agriculture, Extension bulletins, research publications as well as archived copies of this newsletter at the above website.

# *Policy*

## *New Food Safety Rules Are Coming and They Can Affect You*

Food safety has become a major issue in recent years, all the way from the globalized food system down to your local farmers market. Each year, there are news stories about tainted spinach or melons that send many consumers into a panic. The Food Safety Modernization Act (FSMA) was passed by Congress in 2011 and the rules that will implement this act are currently being written through the Food and Drug Administration (FDA).

The FSMA consists of two rules - the Produce Rule and the Preventative Controls Rule. The proposed Produce Rule will apply to fruits and vegetables normally consumed raw (lettuce, carrots, tomatoes) all the way from growing, harvesting, packing and holding produce. The proposed Produce Rule does not apply to produce rarely consumed raw (such as winter squash) or produce grown for personal consumption. The proposed Produce Rule addresses: testing of agricultural water, the time interval between application of manure of compost and harvest, farm worker hygiene, waiting times between grazing and harvest and monitoring for wildlife, requirements for equipment and tools contacting produce, training requirements and recordkeeping.

The Preventative Controls Rule refers to processors who process, manufacture, pack or store human food. These regulations will affect ALL farmers and processors.

There are certain exemptions that are made for small farmers. The Tester-Hagan Amendment exempts farms that have gross sales of less than $500,000, where the majority of sales are direct to consumers, or a restaurant or retail food establishment that is located in the same state as the farm that produced the food, or not more than 275 miles from that farm. The Produce Rule also does not affect farms where the average annual monetary value of the food sold during the previous 3-year period is no more than $25,000.

The rules are not final and the FDA is requesting comments from the public before they are finalized.

Everyone has a stake in ensuring the FDA writes scale-specific standards that ensure food safety from all farms.

### *Commenting on the Produce Rule*

The rule is quite extensive, so we have highlighted some key points on which farmers and/or the public may want to comment:

~ Importance of maintaining the modified requirements for "qualified" exempt farms and facilities (important to show support for the so-called exemptions),
~ Clarifying a procedure for regaining status as "qualified" exempt if the status has been withdrawn,
~ Questions about how the two rules (the Produce Rule and the Preventative Controls Rule) interact and how FDA would determine if a farm must comply with both rules,
~ Concerns about the 9-month waiting period between application of manure and harvest of covered produce,
~ Concerns about the agricultural water testing requirements in the Produce Rule (they place the burden of water quality on the farmer for water coming onto the farm).
~ Importance of maintaining habitat for ecological control of pests as well as native pollinators

### *Resources*

The National Sustainable Agriculture Coalition has excellent information on both the Produce Rule and the Preventative Controls Rule. This organization also has instructions that will help you navigate the comment process, http://sustainableagriculture.net/fsma/speak-out-today/.

**The full text of the Proposed Produce Rule,**
https://www.federalregister.gov/articles/2013/01/16/2013-00123/standards-for-the-growing-harvesting-packing-and-holding-of-produce-for-human-consumption#h-211

**The full text of the Proposed Preventative Controls Rule,**
https://www.federalregister.gov/articles/2013/01/16/2013-00125/current-good-manufacturing-practice-and-hazard-analysis-and-risk-based-preventive-controls-for-human#h-323

*Kate Munden-Dixon*
*SARE Program Assistant*
*Crop and Soil Sciences Department*
*Univeristy of Georgia*

# Grower's Corner

## *Protecting Beneficials*

When the most recent and well-publicized phenomenon of honey bee disappearance, termed Colony Collapse Disorder (CCD), began, it gave rise to serious concerns, not only among those in the commercial beekeeping industry, but also among environmentalists, academics, the mainstream media and even the general public.

Bees were dying at alarming rates. Large commercial beekeeping operations, having sustained crippling losses, were on the brink of bankruptcy. And thousands of acres of pollinator-dependant crops were in jeopardy. Theories and rumors quickly arose as to why colonies were dying. In response, researchers raced across affected areas to collect samples and begin their investigations. The initial, knee-jerk accusations, blaming everything from cellular emissions and high-voltage power lines to UFOs and solar flares, began to fill the airwaves. However, cooler heads prevailed and the Coordinated Agricultural Project (CAP) was started to actually examine the facts and just the facts, ma'am. The project attracted 17 institutions, including UGA, from across the US to study why bees were dying, and hopefully find a cure. For four years, nutrition, disease, mites, environmental toxins, miticides, habitat loss, along with other potential culprits have been investigated. The conclusion: while there is no single "smoking gun," the causation of the syndrome seems to be a combination of stress on the bees, contributed chiefly by varroa mites (an exotic ectoparasite) and toxic chemicals (in the hive and environment).

For decades now - even before CCD - honey bees and other pollinators have been in decline. Reasons for their disappearance include the stresses mentioned above. So, how does this decline affect each and every one of us?

One-third of the food we eat is made available by the hard work of bees, butterflies, ants, beetles, wasps, moths, hummingbirds, bats and other small animals as pollination vectors. Approximately 1,000 agricultural plants grown for food, beverages, fibers, spices and medicines depend on physical pollination (i.e., by an active agent or vector, as opposed to self-pollinated or passively wind or water pollinated). For example, most of the fruits, nuts and vegetables found in grocery stores would no longer be available if honey bees and other pollinators were to become extinct. Instead of the flavorful and colorful meals that we take for granted every day, we'd be forced to eat gruel: a bland diet of base starches, such as corn, barley, wheat and rice. So, in essence, the human race wouldn't starve without pollinators, but we would have to say goodbye to fun and exciting experiences like fruit smoothies and salad bars, to name a couple. Correspondingly, our landscapes and yards would also become drab since 75% of all flowering plants rely on pollinators for reproduction.


*A honey bee on smooth sumac*

Along with pollinators, there are also other "beneficial" insects that are important. Beetles (lady bugs), praying mantises, green and brown lacewings, parasitoid wasps, and many spiders can consume or parasitize large amounts of agriculturally destruc-

tive species. So, what can we do to help protect these pollinators and other beneficials? To begin with, plant a wide variety of native flowering plants, shrubs and trees to provide habitat and resources (nectar and pollen). Plants such as hyssop, salvia, bad bugs (the ones we want to get rid of), but also the pollinators and other beneficials. Before reaching for that can of pesticide, try non-chemical approaches first. For example, spray plants with water to remove unwanted pests.

*A female carpenter bee on smooth sumac*

Another thing to consider is whether or not there are actually any true pests at hand. Do you see damage? If so, use such clues to try to identify the specific pest(s) before automatically reaching for a broad-spectrum pesticide. Extension agents, nursery workers, and certain botanical and entomological websites are excellent sources for guidance. And even when an identified pest is doing damage, it may still pay off to have patience. Plants and animals can tolerate a certain amount of infestation or infection. The tomato plant, for instance, can tolerate a given level of whiteflies or aphids before its productivity and viability are compromised. This may be due in part to natural resistance and regenerative abilities of the particular plant species as well as the environmental presence of beneficials preying on the destructives. If the pest populations never reach truly damaging levels, then insecticides would not be necessary. The point here is that reacting with a pesticide application should be neither an immediate nor automatic response. Yet, there are clearly times when chemicals can serve as a last resort.

When the latter is the case, you can still reduce exposure to pollinators and other beneficials by incorporating the following tips: Timing is of the utmost importance when using pesticides where beneficials, including pollinators, reside. The best time to apply pesticides is in low-wind conditions and after the sun has set. And, try not to contaminate the blooms.

Instead of broadcasting a chemical across large areas, apply it directly to where the damage is occurring (spot applications); this not only reduces unintended impact, but saves money - i.e., chemicals are expensive! Choose pesticides that break down rapidly and are the least toxic. The larger box stores, along with local nurseries, now offer "safer" products such as insecticidal oils, soaps, and some pyrethrins. Bacillus thuringiensis (Bt) is an excellent biological pesticide that controls caterpillars with little to no risk to beneficials.

Another helpful tip is to be aware of the chemical formulation. Dusts such as Sevin® and wettable powders can wreak havoc on beneficials, especially ones that rely on pollen as a food source. Bees, for instance, collect pollen and take it back to the nest to store and eventually feed to their young. Pollen is the protein source for brood development. If the bees come into contact with toxic dust or dried powder, it is collected as pollen, taken back to the nest (as long as the forager survives the exposure), kills both adults and brood, and saturates the wax comb to affect future generations and new colonies to come.

These simple tips can reduce the impact of environmental toxicity on pollinators and other beneficials in our backyards, gardens and farms, which will help us all in the short and long term. To learn more about beneficial insects, as well as topics on honey bees and beekeeping, please go to our website: www.ent.uga.edu/bees

*Jennifer Berry*
*Lab and Apiary Manager*
*University of Georgia Honey Bee Lab*
*Photos: Nancy Adamson*

## *Pollinator Habitat: Making the Most of What You Have*

Interest in developing and maintaining pollinator habitat is at an all-time high at the moment, largely driven by the USDA's Natural Resource Conservation Service Pollinator Initiative. This initiative seeks to increase pollinator populations by creating and maintaining pollinator habitat nationwide.

For an individual who is interested in developing pollinator habitat the first question is typically, "What can I plant?" In this case the better question would be, "What do I already have?" Most folks look past ideal habitat that is already present on their property or overlook simple, inexpensive ways to increase pollinator friendly plants. Here are suggestions on where to start your evaluation.

First, recognize the habitat present and native pollinators already utilizing your property. Make a list of what you observe such as butterflies, bees, moths and humming birds and wild flowers. Look for areas you use very little if at all. You will probably be amazed at what you find!

Second, adapt your current management practices to minimize harm to pollinators and existing habitat. If you don't already do so, utilize Integrated Pest Management (IPM) strategies to help in handling pest problems. Remember that most weeds are actually wild flowers and provide nectar and pollen gathering opportunities. A big contribution here is to change your mowing habits.

Step three, develop pollinator habitat on your property.

The first two steps require very little to only a moderate amount time, cash and commitment. The third step requires more thought and resources, but… if we take our time and work deliberately utilizing what we have, we can keep investment at a minimum and maximize time and commitment. By working deliberately you will also determine if developing habitat beyond what you already have is worthwhile to you.

**Find and identify important plants on your site**

Look for common plants and shrubs you already have that attract pollinators such as Sumac, Thistle, Verbena, Clover, Plantain, Golden Rod, Aster, Yarrow, Sunflower, Buckeye, Blackberry, Blueberry, Plum and other wild fruits. Exotics like Kudzu, Privet, Chinaberry and Mimosa also provide nectar and pollen resources but are considered non grata now days because they tend to take over a given area crowding out native plants; none the less, they remain resources. Look for plants that bloom over a long period or bloom in secession with each other.

**Find insects by looking for nest sites**

Semi-bare to bare earth on slopes and dry upland areas are great nest sites for digger bees. Old timber snags and other "old" wood with borer tunnels make good nesting habitat for native bees as well. Rodent tunnels and nesting sites in lodged grass and weeds are good areas for bumblebee reproduction. Bees that are searching in areas without flowers is a dead give away of a nesting site.

*Nesting holes of miner bees*

**Look for available habitat**

Think about marginal areas on your property. Areas of low fertility, or problem spots you constantly fight. These may be areas just outside of the reach of irrigation or corners that equipment like mowers doesn't fit into without great effort. Take a minute to think about areas on your property that you don't frequent very often. The areas between field roads and the woods or areas that line drive ways, water ways and road borders provide opportunities to expand habitat options. Pasture and woodland edge where tree roots intrude into fields and pastures reducing crop yields are excellent places to develop into pollinator habitat. Stream edges, unused areas around farm buildings, fence rows, service areas, utility right of ways and road right of ways behind the "ditch" provide additional opportunities.

Quite often a simple way to establish pollinator habitat in the areas described above is to stop or strongly limit mowing, allowing Mother Nature to do her work. Plants that develop in these areas are typically natives that are drought tolerant and well-adapted regionally.

Creating hedge rows along fences and borders takes advantage of areas that are lightly to completely unused on a typical property. If maintenance is halted on these areas flowering plants and brambles typically establish themselves quickly. Seeding annual and perennial flowers and planting flowering shrubs in these areas will help fully develop their potential.

*Hedge row bordering a field.*

Another way to promote pollinator habitat is to reduce risks to pollinators. Carefully manage pesticide applications to reduce drift. Select insecticides that are less toxic to pollinators when you need to control a particular pest. Take care in selection and use of herbicides around fallow areas as even light drift can result in depleted habitat.

As you can see developing pollinator habitat can be as simple changing the way you think about managing certain areas of your property. Reducing maintenance and allowing nature to take its course will go a long way towards helping you meet your pollinator habitat goals.

*Keith Fielder*
*Putnam County Extension Agent*
*University of Georgia*
*Photo Credits: North Carolina State University, Julia Gaskin*

# *Research*

## *Vegetable Variety Development Survey*

Over the years, we have received many comments from stakeholders that we needed more "place-based" research. Farmers want information and plant varieties suited to Georgia. We know that small farms are growing in Georgia and many of these growers use ecologically-based production practices. Vegetable crop varieties may perform differently in conventional versus ecologically-based production and the needs for small farms can be different from large commercial farms. For example, large growers that sell wholesale may need varieties that ship well, while small farms that sell direct to consumers may need crops that have unique looks or taste. Vegetable breeders at the College of Agricultural and Environmental Sciences are interested in developing new vegetable varieties specifically for small farms. These plant breeders needed a better idea of which vegetable characteristics are preferred by growers on small farms.

Earlier this year, UGA researchers, Julia Gaskin, Cecilia McGregor, and Kate Munden-Dixon surveyed growers about the characteristics they prefer in tomato, bell pepper, watermelon, and sweet potato varieties.

Over 25 farmers responded with the majority from northeast Georgia and several from South Georgia and Florida. Most of the respondents farm less than 5 acres (82%) and sell at farmers' markets (88%). All of the farmers grew tomatoes; 78% grew bell peppers, 70% grew sweet potatoes, and only 59% grew watermelons. Taste was overwhelmingly the preferred trait with fruit yield coming in second for all four crops. While this is a small sample, the results give researchers a picture of what small farms in Northeast Georgia are looking for with these crops. More information on preferred varieties and traits for each crop is listed below.

### *Tomatoes*

Most growers use heirloom tomatoes (85%), followed by F1 hybrids (63%), certified organic (37%), and then other open pollinated varieties (30%). Unsurprisingly, excellent fruit taste was the highest ranked trait, followed by high fruit yield and disease resistance. Weed suppression and unique fruit shape were the least valued traits for tomatoes. The main factor determining the variety choice was fruit quality. Georgia farmers use a wide variety of tomatoes, with 40 reported in the survey. Cherokee Purple was the most popular (10 farmers), followed by Sungold (6), Brandywine (4) and Celebrity (3).

### *Bell Peppers*

F1 hybrids (70%) were the most common type of bell pepper grown followed closely by heirlooms (65%), then certified organic and other open pollinated varieties both at 40%. The most preferred trait was excellent fruit taste with high fruit yield a close second. Fruit quality was the main factor determining variety choice. There were a number of pepper varieties listed with no clear favorite. California Wonder and Flavorburst were grown by three farmers. Carmen, Gourmet, Red Knight, Sweet Chocolate, Raud of Hungary, and Islander were grown by two farmers. The remaining 19 varieties were only listed once.

### *Watermelons*

Heirloom watermelons were by far the most prevalent variety type (94%) with seeded F1 varieties (50%) and other open pollinated varieties (38%) the other most frequent choices. Again, excellent fruit taste and high fruit yields were the most preferred traits. Fruit quality was the main factor determining variety choice. Disease resistance was the next most important trait. The varieties most grown were Crimson Sweet, Sugar Baby, and Moon and Stars.

### *Sweet Potatoes*

Growers used commercial virus tested slips (63%) and their own roots stored from the previous season (53%) for the slip source. Excellent taste was the most important trait followed by high yield then disease resistance. Taste (63%) was the main factor for determining the variety selected, followed by root yield (21%) then ability to obtain virus tested material (11%). The varieties most grown were Beauregard and Georgia Jet.

*Julia Gaskin*
*Sustainable Agriculture Coordinator*
*Crop and Soil Sciences Department*
*University of Georgia*