

Sustainable Agriculture

Looking forward for this generation and the next... at **UGA**



Winter 2016

Georgia is blessed with a highly diverse agriculture. The Farm Gate Report from the Center for Agribusiness and Economic Development lists 60 significant crops and sources of agricultural income. As you might expect broilers are number one at \$4.5 billion. Row crops and forages are significant in the dollar amount (\$2.4 billion) and we are also a major producer of vegetables (\$1.0 billion). The top five vegetable crops? You guessed it – onions, along with bell peppers, watermelon, sweet corn and a category called ‘Other Vegetables’. Fruits and nuts are also a big crop (\$772 million) with blueberries at the top of the list. Did you guess peaches?

What does this have to do with sustainable agriculture, you may be thinking. Because we can grow so many different crops, we have opportunities to combine crops in innovative ways to create profitable farms that minimize environmental impacts. Hopefully, these innovative practices also improve quality of life for farmers, farmworkers and the community. At least, that’s the goal.

One such innovation is a perennial clover and corn system that also includes grazing cattle to encourage clover regrowth. Check out the article on this system in the following pages. This is a good example of combining different approaches to take another step towards a sustainable row crop production system.

As always, good growing.
Julia

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Upcoming Events

Feb. 10th, 2016 - 5th Annual Northeast Georgia Beef Cattle Short Course - Athens, GA

*Feb. 26-27th, 2016 - Georgia Organics Conference
Columbus, GA*

March 30-April 1, 2016 - National Food Hub Conference - Atlanta, GA

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.

Extension

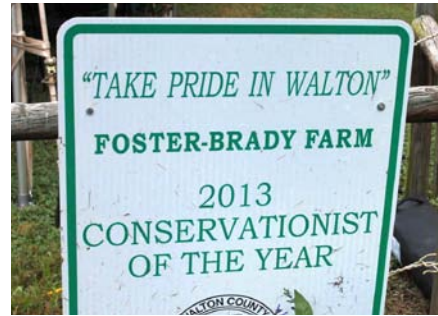
Pollinator Field Day in Walton County

Pollinators seem to be a **BUZZZZZZZZZZZZ** topic for discussion and interest among the agricultural community and with good reason. Honey bees across the world are declining for numerous reasons including diseases, exposure to pesticides, and loss of habitat. Pollinators are responsible for assisting in the pollination of over 80% of the world's flowering plants. This is alarming because without pollinators the majority of the fruits and vegetables we enjoy would not be available at our local grocery stores. Walton County Extension and other local organizations saw the need to educate the local community about the importance of pollinators and how we all can help them thrive.

Walton County Extension, USDA, Walton County Soil & Water Conservation District, Georgia Farm Bureau, and Athens Land Trust collaborated to bring the citizens of Walton County a Pollinator Field Day. This event was a success and had over 80 participants from across the state, Florida and Alabama. The field day was held on Foster-Brady Farm in Walton County. This farm was chosen for the event because of the great job they do in providing pollinator habitat and on-site bee hives provided by the University of Georgia. The take home message for this event was to make people aware of the serious threat to pollinators and to teach them how to provide habitat for pollinators of all kinds.



Bee hives lined up at the Foster-Brady Farm in Walton County. "Beware the last one" they told us... "that box has all the angry bees!"



One of the highlights was speaker Trina Morris representing the Georgia Department of Natural Resources who taught the attendees about bats and how to provide habitat for the native bats in their area. In case you were wondering, yes, bats are considered pollinators too! Bats like to roost in large hollow trees but their natural habitat has been logged, and large, old trees are hard to find. Bats spend more than half of their lives in roosts.

One way to help bats survive is to create habitat for bats in your community. You can build one from simple instructions and basic inexpensive materials or buy an approved bat house. Whether you build or buy a bat house, be sure to contact Bat Conservation International (BCI) for the most current list of "bat approved" bat houses. If presented in the appropriate habitat, properly designed bat boxes have proven to work consistently to attract bats. If you want to attract bats to your yard, do not use insecticides. Insecticides not only kill the insects that bats eat, but they also can harm the bats directly. In many cases, bats keep insect populations low enough that there is no need for insecticide use. Farmers have even harnessed the insect eating power of the bat by placing bat houses in their orchards and other areas of mixed agricultural use.

Georgia DNR Quick Tips for Bat House Placement:

Height: Boxes mounted 20-30 feet high have greatest success

Sun Exposure: Boxes should receive at least 6 hours of full sun

Surrounding Habitat: Open areas like fields and large yards are desired

Proximity to Water: Lakes, rivers or streams are important

The crowd gained knowledge and tips from other speakers like: Jennifer Berry-UGA Bee Lab Manager who gave tips on how to help keep bees alive and thriving.

Reduce: Or completely limit the use of pesticides. Don't spray insecticide in your yard but if you have to, spray in the evening when bees are least active and the chemical has a chance to break down before morning. Don't use dust or wet-able powders.



Jennifer Berry of the UGA Bee Lab explains how pollinators work very hard and the end result is the colorful array of foods we get to eat because of them.

Buy local: Buy local honey to support your local bee keeper's efforts. Also this guarantees purity and quality as imported honey might not be 100% pure in some recent cases.

Plant: Whether it's a window box at your apartment, a garden in your backyard or a green space in your community, there's something you can grow to help bees, no matter where you live.



There was private-label, all-natural "UGA Honey Bee Farm" honey for sale at the Pollinator Field Day.

Keith Fielder-UGA Extension Putnam County shared lots of information on native plants. Interestingly, dandelion flowers and many other plants we consider weeds are a nutrition source for bees.

Access to dandelions and native flowers means bees get the nutrition they need to have a health hive. Jennifer Anderson-Cruz-NRCS Biologist shared her knowledge about wild seeds and mixes that are helpful in establishing pollinator plots. The homeowner and farmer walked away with the small steps they could take to make a huge impact on pollinators and their habitat.



Dandelions and native flowers are an important source of nutrition for bees even though we may consider them weeds.

Negatively altered natural habitats lead to the decline of pollinator population and native plant population. This is the brutal cycle. Without native plants pollinator population decline. Without enough pollinators to pollinate native plants, native plant species decline. Gardeners and farmers can take small steps by planting native plant habitats throughout the home and farm. This will benefit more than just the farmer but the collective whole. It is without a doubt that the issue of declining pollinators will continue to be of substantial importance. We can make a difference if we all do our part.

*Joel Burnsed
County Coordinator
Agricultural & Natural Resources Agent
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Research

Feeding Cities: Gardens are great, but what about trees?

The community and school garden movement has grown tremendously since the 1990s. Even urban farms have become increasingly popular over recent years as an approach to alleviate food insecurity, renovate blighted urban spaces and provide economic opportunities in post-industrial cities. However,

it's possible that we limit our ability to reach some of these goals by restricting urban food production to annuals grown in garden plots.

Urban food forestry is a recent idea that can supplement the capacity of urban farms and gardens and expand into areas that aren't typically considered food-growing spaces. Food forestry is the use of woody plants (trees, shrubs and vines) for producing food, and urban food forestry exists conceptually at the intersection of agro-forestry and urban horticulture.

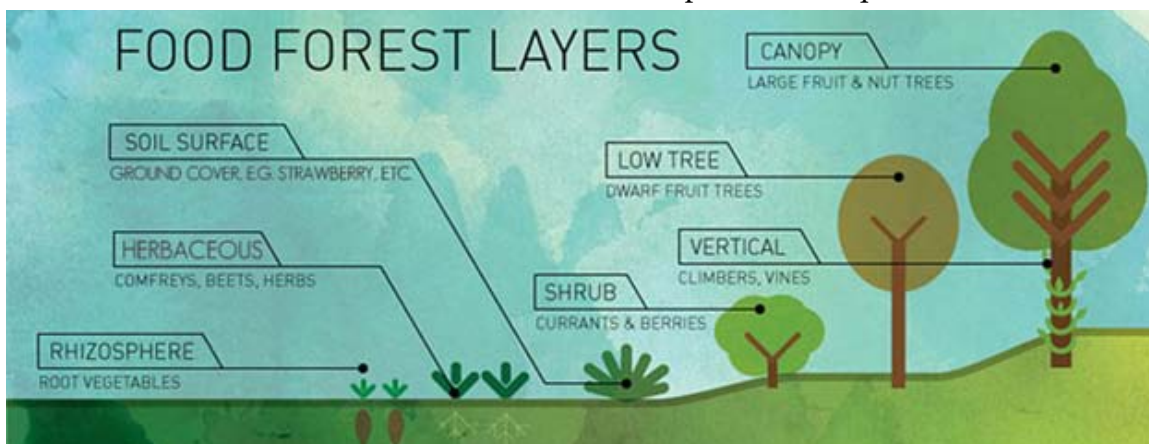
In practice though, it takes a number of forms. On the more familiar end of the spectrum food forests resemble traditional orchards, although they are not monocultures. More innovative approaches to food forestry draw on permaculture principles to mimic plant guilds found in natural forests. Somewhere in the middle, food forests that are integrated into other landscapes may hold the most potential to meet goals of sustainable cities.

Although woody plants are sometimes included in gardens and farms, they can also interfere with annual plant cultivation. Larger trees can be especially problematic. However, woody plants in other spaces, like parks, greenways and private yards, are used to create multifunctional landscapes that combine recreation, aesthetic enjoyment and ecosystem services (heat mitigation, storm water management, wildlife habitat, etc.) and create pleasant, green cities. Urban food forestry offers the possibility to include food without necessarily detracting from other aspects.

As an added bonus, food in public areas could be literally free for the taking.

The question is how urban food forestry might fit into the community and how it could contribute to USDA dietary fruit intake recommendations. An exploratory GIS analysis of three kinds of spaces (community and school gardens; public parks and greenways; single family residential zones) in Athens-Clarke County, GA showed some surprising results. For all nine plants species evaluated, at 5% canopy cover, community gardens, parks and greenways combined could provide less than 1% of recommended fruit intake for residents. Schools offered somewhat more, at most about 7% of recommendations for the student population. However, the situation in residential areas was very different; the top four plants, blackberry, muscadine, apple and pear, yielded respectively 48%, 57%, 86% and 231% of recommended annual intake for people living in those zones. That is, for each acre of land in Clarke County residential zones, only two pear trees of roughly 26^{ft} canopy diameter could provide more than twice the annual fruit requirements for the people who live there. Although community and school gardens, public parks and greenspaces could only provide a limited contribution to dietary fruit intake, plants on private property could generate from half to twice annual requirements for local residents.

There are obstacles to adoption of urban food forestry. First, not everyone lives in areas with sufficient land for these plants. Soil types, slopes and exposure may also limit potential productivity, as might pests. These plants also require some care; this isn't a plant-



A Food Forest drawing showing the productive layers that can be planted.

Image source: takepart.com/article/2014/03/07/austin-hotbed-music-technology-andforaging



*City Fruit Seattle, WA By: Camille Sheppard Dohrn
Source: seattleweekly.com/home/957025-129/city-fruit-saves-urban-orchards*

it-and-leave-it approach. There are also concerns about food safety, particularly regarding pests and soil toxins. Many municipal ordinances restrict plant species that can be grown in certain places. Finally, and perhaps most importantly, there are popular ideas about appropriate spatial uses limiting food production to designated areas; we like to compartmentalize (gardens, parks, decorative plants, etc.) and often don't consider urban commons as providing material goods for free consumption. However, if we adjust the way we think about productive spaces and change laws to reflect that view, food forestry could enhance cities' capacity to feed themselves. At any rate, individuals and governments should consider including woody perennials for food provisioning in urban landscapes.



*George Washington Carver Edible Park, Asheville, NC
Source: thisnaturaldream.com/edible-asheville/*

*Jason M Wood
Geography Graduate Fellow
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Growers Corner

A Living Mulch for Better Row Crop Production

Large scale row-crop production is often viewed as dependent upon high chemical inputs that potentially pollute our environment, especially synthetic nitrogen fertilizer. A research project at the University of Georgia attempts to mitigate the need for nitrogen fertilizer while providing environmental services to reduce the impact of row-crop agriculture. The concept uses Durana white clover as a perennial "living mulch" cover crop into which row-crops can be planted in herbicide-induced dead strips. Nitrogen released from the dead strips provide the crop with "starter" fertilizer. As the crop grows, it shades the remaining living clover - causing it to drop its leaves and release more nutrients to coincide with crop growth. At the end of the growing season the clover re-grows into the dead strips after crop harvest.



Corn growing in the living mulch system.

A key to promoting clover regrowth is removing crop residue that sits on top of the clover after harvest. The research project integrates livestock and row-crop agriculture to graze crop residues to "release" the clover for regrowth. Pregnant heifers grazing the clover/residue mixture obtained a high quality diet in September and October with weight gains of 1.2 lbs/day - a time of the year when such opportunities are limited.

Small-scale research plots show promising corn yields of 140-240 bu/A without added nitrogen fertilizer. Consistently getting the higher yields



Crop residue and clover prior to grazing.



Clover regrowth 14 days after grazing.

may be dependent upon planting corn when clover conditions are optimum rather than on pre-determined corn planting dates. But research has progressed enough to examine how the living mulch system serves to the benefit of the environment. Two fields were planted into two corn systems – one using the living mulch and the other a no-till system using a cereal rye cover crop. The fields were matched in size and slope so water runoff and erosion could be compared. The living mulch system not only reduces water runoff but it also reduces the

amount of soil in the runoff. The living mulch system has more suspended organic matter in the runoff due to the added organic matter on the surface of the soil. Nutrient runoff from the two systems are being quantified to determine whether the living mulch system has the potential to reduce pollution in down-stream rivers and lakes. The initial results provide a clear indication that the living mulch has environmental benefits beyond that of no-till cereal rye, a well-established soil and water conservation production system.

The living mulch research project has provided inspiring results as an alternative to traditional row-crop production systems, especially with corn. However, to be a viable alternative to established production systems means that it must be flexible enough to fit into crop rotations. Cotton is grown on nearly 1.4 million acres in Georgia's making it the state's largest row-crop. Initial trials growing cotton in the living mulch system are equally encouraging.



Filtered sediment from the living mulch field (left) and the cereal rye field (right).

*Dr. Nicholas Hill
Department of Crop and Soil Science
University of Georgia*

The Journeyman Farmer program provides a comprehensive training for beginning farmers. The program will be held in Screven, Carroll, Dougherty, and the Metro-Atlanta area in Fall 2016 and Winter 2017.

We'll keep you posted as dates and locations are finalized!

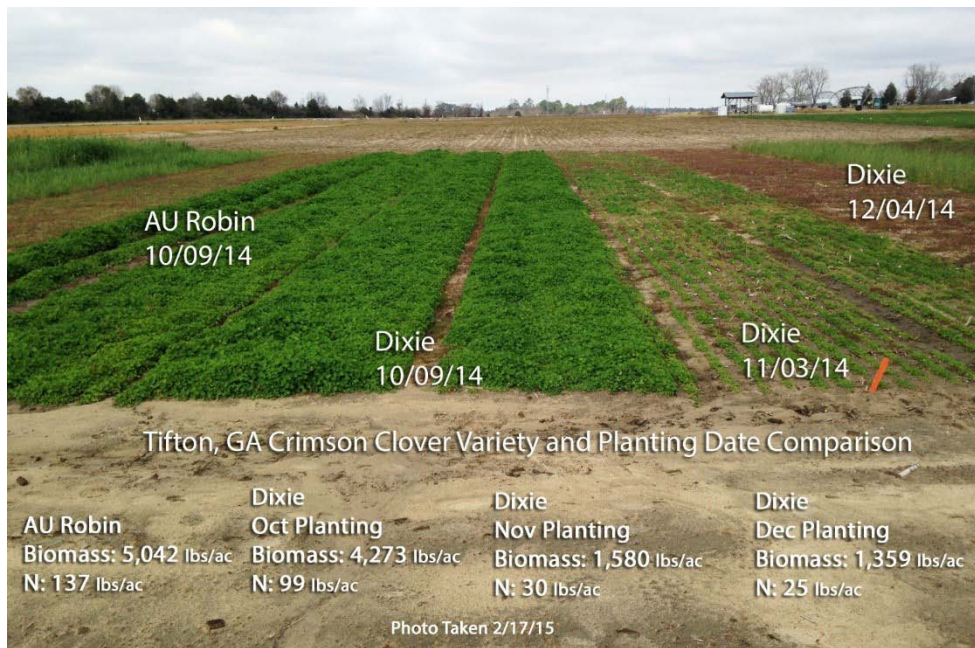


Mark your Calendar

March 15, 2016 - Getting the Most from Cover Crops - Southeast Research and Education Center Field Day
Midville, GA

The field day includes demonstration on cover crop varieties and mixtures that can help you achieve your goals for erosion control, weed control, nitrogen, and more. Learn how to maximize biomass to maximize cover crop benefits through presentations and field demonstrations. Lunch will be served after the field demonstration. The program is free but pre-registration is encouraged. Please contact:

Pam Sapp, Jefferson County Extension office. 478-625-3046. pamsapp@uga.edu



For monthly recommendations use the UGA Extension Publication Vegetable Garden Calendar (C 943):

You can plant or harvest something from your garden almost all year in Georgia. The two major planting periods, however, are spring (March to May) and fall (mid-July to September). The spring plantings are harvested in June and July, while the fall plantings are harvested from October to December. January and February are prime times for looking at seed catalogs, dreaming of warm spring days, preparing garden plots, and getting ready for a productive season.

Check out the details online: <http://extension.uga.edu/publications/detail.cfm?number=C943>

Home Gardening Planting Chart

A Garden Planting Chart

Crop	Days to Maturity	Spring Planting Dates	Fall Planting Dates	Seed/Plants 100 ft.	Distance Between Rows	Distance Between Plants	Depth to Plant
Asparagus	2 nd season	Jan. 15-Mar. 15	Nov. 1 - Dec. 1	50 roots	3 to 5 ft.	1½ to 2 ft.	6 in.
Bean, bush	50-60	Apr. 1 - May 1	July 15-Aug. 20	½ lb.	3 ft.	2 to 4 in.	1-1½ in.
Bean, pole	65-75	Apr. 1-May 1	July 15-Aug. 10	½ lb.	3 ft.	6 to 12 in.	1-1½ in.
Bean, lima	65-75	Apr. 1 - June 1	July 1-Aug. 1	1 lb.	2 to 2½ ft.	3 to 4 in.	1-1½ in.
Beet	55-65	Feb. 15-Apr. 1	Aug. 1-Sept. 20	1 oz.	2 to 2½ ft.	2 in.	1 in.
Broccoli	60-80	Feb. 15-Mar. 15	Aug. 1-Sept. 1	100 plants	2½ ft.	14 to 18 in.	
Cabbage	65-80	Jan. 15-Mar. 15	Aug. 15-Oct. 1	100 plants	2½ ft.	12 in.	
Cantaloupe	80-90	Mar. 25-Apr. 20	Not recommended	1 oz.	4 to 6 ft.	3½ to 4 ft.	1½ in.
Carrot	70-80	Jan. 15-Mar. 20	Aug. 20-Sept. 15	½ oz.	2 ft.	2 to 3 in.	½ in.
Cauliflower	55-60	Mar. 1-Apr. 1	Aug. 1-Sept. 1	100 plants	3 ft.	12 to 18 in.	
Collard	55-70	Feb. 1-Mar. 20	Aug. 1-Oct. 1	½ oz.	2½ ft.	8 to 16 in.	½ in.
Corn	80-100	Mar. 15-June 1	June 1-July 20	¼ lb.	3 to 3½ ft.	12 to 18 in.	2 in.
Cucumber	60-65	Apr. 1-May 15	Aug. 20-Sept. 1	1 oz.	3½ to 5 ft.	3 to 4 ft.	1½ in.
Eggplant	75-90	Apr. 1-May 15	July 10-15	50 plants	3 ft.	2½ to 3 ft.	
Kale	50-70	Feb. 1-Mar. 10	Aug. 10-30	½ oz.	3 ft.	10 in.	½ in.
Lettuce	60-85	Jan. 15-Mar. 1	Sept. 1-Oct. 1	½ oz.	2 to 2½ ft.	10 to 12 in.	½ in.
Mustard	40-50	Jan. 15-Apr. 1	Aug. 20-Oct. 1	½ oz.	2 ft.	1 in.	½ in.
Okra	55-60	Apr. 1-June 1	June 15-July 1	1 oz.	3 to 3½ ft.	6 in.	1 in.
Onion (mature)	100-120	Jan. 1-Mar. 15	Sept. 1-Dec. 31	300 plants or ½ gal. sets	1 to 2 ft.	3 to 4 in.	¾ in.
Peas, garden	60-80	Jan. 15-Feb. 15	Not recommended	1 lb.	2½ ft.	1 in.	1½-2 in.
Peas, southern	60-70	Apr. 1-Aug. 1	Not recommended	½ lb.	3 ft.	4 to 6 in.	1½-2 in.
Pepper	65-80	Apr. 1-June 1	Not recommended	50 plants	2½ ft.	1½ to 2 ft.	
Potato, Irish	70-90	Jan. 15-Mar. 1	Aug. 1-Aug. 15	1 peck	2½ to 3 ft.	10 to 14 in.	5 in.
Potato, sweet	90-150	Apr. 15-June 15	Not recommended	100 plants	3½ ft.	12 in.	-
Radish	25-30	Jan. 15-Apr. 1	Sept. 1-Oct. 15	1 oz.	1½ ft.	1 in.	½ in.
Spinach	40-45	Jan. 15-Mar. 15	Sept. 1-Oct. 15	1 oz.	1½ to 2 ft.	1 to 2 in.	¾ in.
Squash, bush	50-55	Apr. 1-May 15	Aug. 1-20	1 oz.	3 to 4 ft.	2 ft.	1½-2 in.
Squash, winter	85-90	Apr. 1-Aug. 1	Not recommended	½ oz.	5 ft.	3 ft.	1½-2 in.
Tomato	70-85	Mar. 25-May 1	June 1-Aug. 10	50 plants	3 to 4 ft.	2½ to 3 ft.	
Turnip	45-65	Jan. 15-Apr. 1	Aug. 10-Sept. 15	½ oz.	1 to 2 ft.	1 to 2 in.	½ in.
Watermelon	80-90	Mar. 20-May 1	Not recommended	1 oz.	10 ft.	8 to 10 ft.	1½ in.

Note: Planting dates in this chart are approximate for Middle Georgia. North Georgia plantings should vary about two weeks later in the spring and earlier in the fall. South Georgia plantings can be made two weeks earlier in the spring and somewhat later in the fall.