

Sustainable Agriculture

Looking forward for this generation
and the next...

at **UGA**

Spring 2009

Spring is here. No, it's winter. No, spring is here. As I write to you, the leaves are growing from little green dots to full size, yet, here in Athens snow flurries are predicted! Weatherwise, it has been an eventful couple of months. We've gone from drought to floods in some areas, from 75 degree days back to winter. Hopefully, the weather will soon settle down and we can get to growing things in earnest.

One thing that is growing is the interest and research in several areas related to sustainable agriculture. The **College of Agricultural and Environmental Sciences (CAES)** faculty and their cooperators have received new grants to investigate subjects from beneficial insects to budgets for grazing dairies. You will find in this newsletter a brief summary of some of these efforts.

There have also been a number of educational activities. We held a workshop on grafting heirloom tomatoes onto disease resistant rootstock, despite 6-inches of snow the weekend before and no electrical power. We have held regional forage trainings on ideas to make cattle production more profitable throughout the state with one last workshop to be held in Franklin County on April 23rd. We held two workshops on selling to retailers that included presentations from Whole Foods, Kroger, Destiny Produce and restaurant chefs.

There's more to come. The High Tunnel Production workshop will be April 22. Check our website- www.SustainAgGA.org frequently to keep up to date on workshops and farm tours throughout the state.

On another note, in this issue Dr. George Boyhan summarizes some recent rule changes in the National Organic Program (NOP). We are also bringing you an update on approaches to manage squash virus diseases. We hope you find the information helpful.

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New Sustainable Ag Research

One of the top four critical needs identified by the participants at the 2008 Sustainable Agriculture Summit was more Georgia-based research. Several groups are cooperating to get more research projects started that will yield the information farmers need, which has resulted in the funding of new research projects by USDA Southern SARE and the Organic Farming Research Foundation.

Florascaping

One new Southern SARE funded project will investigate whether planting flowers to attract beneficial insects really improves the biological control of insects in vegetables. Although planting flowers to attract beneficials is popular, evidence from Australia and other locations indicates that these plantings may not have the intended effect of reducing pest populations. The project, headed by Dr. John Ruberson, Department of Entomology at the CAES Tifton Campus, will determine how floral plantings impact pest and natural enemy populations in broccoli and cucumber, and determine the overall impact on the yield and quality of these two vegetable crops. This research, which will be conducted in Athens and Tifton, will benefit vegetable producers by generating better guidelines on farmscaping programs that will foster natural enemies and discourage pests.

Organic Blueberry Production

Another project is developing ways to control diseases, insects and improve fertility in organic blueberries through the use of fish extracts. Recent yield loss estimates indicate that foliar diseases such as Septoria leaf spot, Gloeosporium leaf spot, Phyllosticta leaf spot, and leaf rust, are responsible for up to 30% of the total

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Organic Blueberry Production, cont'd

disease-related blueberry losses in Georgia. Fish extracts have been used successfully to manage foliar diseases in other crops, and in a recent field trial of several organic fungicides, two OMRI-approved fish extracts provided substantial control of Septoria leaf spot, the most common and most important foliar blueberry disease. Fish extracts also can repel and reduce insect and mite feeding, and may provide readily available macro- and micro-nutrients, including phosphorus, to support summer plant growth. Dr. Harald Scherm, CAES Plant Pathology Department in Athens, is leading this Southern SARE funded effort to provide better methods of growing organic blueberries.

Grazing Dairies

There has been a considerable effort to evaluate forages and water use in grazing dairies throughout the state. Dairy cows have a very high energy demand while they are producing milk; consequently, successful grazing dairies require a forage program that will provide high quality forage to meet the energy demands of the lactating cow. This Southern SARE funded project, led by Dr. David Kissel, CAES Crop and Soil Sciences Department in Athens, will combine forage yield and quality information to develop a web-based planning tool for irrigated forage programs based upon expected milk yield rather than forage production alone.



Cattle congregate under cooling mist at New Zealand style grazing dairy.

Organic Cover Crop Seed Production

Cereal and legume cover crops are integral to organic production systems and the NOP standards indicate that organic seed should be used when available; however, organic cover crop seeds are not widely available. If organic cover crop seed production is a profitable

enterprise for growers, it will improve the availability of varieties adapted to the Southeast, provide a source for locally grown seeds, as well as adding another profit center for certified organic growers, seed cleaners and local seed companies. This Organic Farming Research Foundation funded project is headed by Mr. Ray Hicks, Screven County Extension. The on-farm project will determine: seed yields, seed quality, profitability, and special equipment adaptations or infrastructure needs.

So, you can see from these newly funded research proposals we have several good projects beginning. We are looking forward to results that will be useful to the farmers of Georgia.

Come join us on Earth Day!

The University of Georgia's Horticulture Department is having a field day at the Horticulture Farm in Watkinsville, GA, focusing mainly on blueberry production in high tunnels. The program will start with a welcome from Dr. Doug Bailey, Horticulture Department Chairman. Dr. Marc van Iersel will follow with an overview of high tunnel production.

Andrew Ogden, a graduate student in the department, and Dr. Gerard Krewer will give presentations on organic blueberry production in high tunnels. Dr. Harald Scherm from Plant Pathology will discuss blueberry disease control. Dr. George Boyhan will discuss organic vegetable production in high tunnels. Lunch will be followed by afternoon tours of the Horticulture Farm facilities and local organic farms with high tunnels.

The field day will be held on April 22, 2009 from 9:00 am to 3:00 pm. The location will be at the UGA Horticulture Farm, 1221 Hog Mountain Road, Watkinsville, GA 30677. This program is free but registration is required to get a head count for lunch. If you wish to attend please email Dr. Marc van Iersel at mvanier@uga.edu for a copy of the program, registration form, and directions to the farm. We look forward to seeing you on Earth Day!



Grower's Corner

Notes from Dr. George Boyhan

Squash Virus Control in Organic Production

Organic production precludes the use of synthetic pesticides. This does not, however, leave growers with no means of controlling unwanted pests and diseases. In some cases cultural practices, variety selection, and time of planting can ameliorate many problems. A good example of this is mitigating virus diseases in summer squash.

Summer squash, whether yellow or zucchini, are highly susceptible to virus diseases. These diseases are transmitted in squash by aphids as they move and feed between infected and uninfected plants. Aphids, like most insects, become more numerous as the season progresses. Growers can avoid a lot of these problems just by planting squash in early spring. Planting a succession of squash every two weeks starting in early spring can extend harvest into early summer. Generally, however, as aphid populations build up through the season, it becomes more difficult to produce uninfected fruit and once a plant is infected there is no way to cure the plant of the disease. In late summer and fall, these insects can transmit virus diseases very quickly resulting in plants that produce little or no fruit before succumbing to these virus diseases. For homeowners, the answer is to grow squash in the spring and avoid these problems altogether. For commercial growers wishing to supply fall markets, this is not an option.



Variety selection can be an important means of mitigating virus disease in squash. Three major sources of virus resistance are available in squash. The first source of resistance is from squash that has been genetically engineered (GMO) for resistance. These varieties are not allowed in certified organic production.

The second source of virus resistance is from interspecific crosses between summer squash (*Cucurbita pepo*) and *Cucurbita moschata*, a related species, the best known of which is butternut squash. The interspecific source of resistance is allowed in certified organic production, but is only partially effective as is the GMO source (not allowed). Many different viruses affect squash and resistance is only effective against a select few viruses. Ultimately, under very high disease pressure one of these viruses will infect the crop. Finally, some yellow squash varieties have the precocious yellow gene, which results in the fruit stem (peduncle) appearing white or light colored. The precocious yellow gene does not really confer resistance, but the symptoms are masked because the mosaic green pattern does not appear on the fruit.



Another method of controlling viruses in squash is to use a reflective mulch. Synthetic (plastic) mulches are allowed in certified organic production as long as the material is removed at the end of the harvest season. Black plastic is the most widely used synthetic mulch, but these mulches are available in a variety of colors including white and silver. The silver mulch has a highly reflective finish akin to aluminum foil. This reflective surface appears to confuse insects such as aphids that don't readily alight on plants grown on such a surface. These reflective mulches don't completely eliminate the problem, but generally delay the onset of virus symptoms, which usually means the harvest can be extended.

Finally non-synthetic horticultural oils may be used when other methods fail. Horticultural oils used to control squash viruses are often called stylet oils because they act as a protectant on the plant. As the aphid probes the plant tissue with its stylet, it is cleaned by the oil of virus particles. This method of control requires a high pressure sprayer that can cover all parts of the plant including the underside of leaves. In

Squash Virus Control continued

In addition, new growth too must be sprayed in order to keep the plant protected. This method is often not 100% effective because of this limitation. Other methods of controlling unwanted pests and diseases in summer squash include variety selection, cultural practices, and lures or traps.

National Organic Program Rules Update

The National Organic Program (NOP) has been fully implemented for the past seven years, and has reached a level of maturity that the NOP should be enforcing the rules. Recently two issues have come to light where there has been some confusion.

One area where there has been some ambiguity in interpretation is crop rotation. Crop rotation is the alternating of crops grown on a specific piece of land in order to break disease cycles, prevent depletion of soil fertility, prevent soil erosion, and ultimately improve soil productivity. In Georgia, with our mild climates, we have a growing season that is essentially year round. This means that multiple crops can be grown every year. For example, onions can be produced in the fall and winter and watermelons in the spring and summer on the same land. This ability to produce more than one crop in a year is called double cropping. In fact, with very short cycle crops such as leaf lettuce and green beans, it is possible to produce multiple crops (triple cropping, etc.) in a single year. This, however, is not crop rotation.

Crop rotation is defined by the NOP rules as:

Crop rotation. The practice of alternating the annual crops grown on a specific field in a planned pattern or sequence in successive crop years so that crops of the same species or family are not grown repeatedly without interruption on the same field. Perennial cropping systems employ means such as alley cropping, intercropping, and hedgerows to introduce biological diversity in lieu of crop rotation.

The NOP rules do not specify a specific sequence of crops other than they be from different crop families, nor do they specify a specific minimum number of years. The NOP understands that different regions and localities will have different rotation requirements, but at a minimum a single crop cannot be planted two years in a row. In Georgia this means that a *winter crop*

followed by a summer crop and replanted to the same winter crop the next year does not meet the NOP standards for a rotation. Certifiers that allow such practices are applying the rules incorrectly. Growers are cautioned not to follow such practices as they may find themselves in non-compliance with NOP rules.

Another recent issue has been that of high nitrogen fertilizer. In a move to insure the integrity of the certified organic program the USDA-NOP announced on February 20, 2009 that they are no longer confident that Marizyme™ and Agrolizer™ from Port Organic, Ltd. meet the NOP regulations. Both products were being spiked with an aqueous ammonia fertilizer, which is prohibited. Both these products were widely used in the organic industry and were suppose to be made from fish products.

This has resulted in the NOP requiring new compliance regulations governing high nitrogen (3% or greater) liquid fertilizers. These regulations will go into effect on October 1, 2009. The following will be required:

- Documentation based on third party inspection that their fertilizer product meets NOP guidelines
- All third party reviewers will have to undergo audits and inspections to be recognized as a reviewer by the NOP
- Fertilizer manufacturers must show via a third party evaluation that their infrastructure is in place to manufacture the product according to NOP requirements
- Fertilizer manufacturers may not have any synthetic nitrogen equipment, tanks, or supplies within 100 yards of the facility to produce organic fertilizers
- Audit verification that incoming materials and finished products meets NOP standards

Certifiers that evaluate and inspect farms rely on third party evaluation of many products to insure that farms are meeting NOP rules. These evaluators, (Organic Materials Review Institute - OMRI, which is the most widely known) do the work of evaluating and insuring that the commercial products farmers are using meet the NOP guidelines. These new rules will help insure the integrity of the program.