Small Farms Field Day
Thursday, June 24

North Carolina A&T State University
UNIVERSITY FARM
School of Agriculture & Environmental Sciences
The Third Annual Small Farms Field Day
Thursday, June 24, 2004

School of Agriculture and Environmental Sciences
at N.C. A&T State University
University Farm

8 a.m. – Registration
Before the tour begins, attendees are encouraged to visit the goat barn where Dr. Mulumebet Worku, staff and assistants will discuss their work with meat goats.

8:30 a.m. – Welcome / Opening Remarks
Dr. Alton Thompson, Dean
School of Agriculture and Environmental Sciences, N.C. A&T

Dr. M. Ray McKinnie
Associate Dean, SAES
Administrator, Cooperative Extension Program at N.C. A&T

Dr. Carolyn Turner
Associate Dean for Research, SAES

The Honorable Bob Landreth, Chairman
Guilford County Board of Commissioners

8:45 a.m. – Load buses and vans

9 a.m. – Tours begin. Each group will rotate every hour.

Tour A
New Poultry Unit
High Tunnel Tomatoes
Swine Innovations

Tour B
Soil Quality Study
Seedless Watermelons
Intensive Grazing

Tour C
Cut Flower Trials
Sunnhemp Summer Cover Study
Heat Tolerant Lettuce Study
Organic Heirloom Field Corn

Noon – Lunch
Lunch provided courtesy of the N.C. Department of Agriculture and Consumer Services, “U.S. Department of Agriculture Specialty Crop Block Grant” program
Going Backwards into the Future
With Old–Time Chickens

RESEARCHERS – Dr. Willie Willis and Mr. Anthony Hooks

OBJECTIVE – The purpose of this demonstration is to illustrate the use of hardier breeds of chickens in pastured poultry operations to family farmers and to assess the production performance, the food borne pathogen carrier state, (Campylobacter jejuni and salmonella) and health attributes of these old heavy breeds of chickens.

OPPORTUNITY – Since the beginning of small family farms, chickens have provided food and valuable products. However, new changes have evolved in the way we raise chickens. Technology, marketing and management have affected production styles. As a result of this evolution in poultry production, there has been a drastic decline in small farm flocks. Current production standards favor hybrid crosses over pure breeds. From this preference, evolved increases in meat, eggs and feed conversion. Moreover, from this evolution comes a decline in flavor, resistance to disease, decreased foraging abilities and weather hardiness. This study and demonstration should show that the old pure-breed chickens are better suited for pastured poultry operations than the standard Cornish crosses.

METHOD – This study and demonstration used five different heavy breeds of chickens: Rhode Island Reds; Plymouth Rocks; Black Australorps; Buff Orpingtons and Silver Laced Wyandottes. They were randomly divided, by breed, and housed in either an enclosed house or in an outside chicken tractor pen. Fecal droppings will be collected and sampled for Campylobacter jejuni and salmonella starting at four weeks of age, and every four weeks thereafter.

DISCUSSION – The performance parameters will be determined and evaluated when these chickens reach marketable and egg laying status. Emphasis on getting to market weight in a short period of time will not be the major assessment factors. Instead, the ability of the bird to take full advantage of all the benefits available to it on pasture. From this demonstration, a growing niche for poultry raised differently on pasture will be observed.
Implementing HACCP for
Small Pastured Poultry Operations

RESEARCHERS – Drs. Willie Willis, Ipek Goktepe and Jimbo Ibrahim; Anthony Hooks and Celestine Murray

OBJECTIVE – The purpose of this demonstration is to show small animal and poultry producers how to make products safe and to prove that the product has been made safely by using the Hazard Analysis Critical Control Point (HACCP) program.

OPPORTUNITY – The Hazard Analysis and Critical Control Point (HACCP) system is a management system that stresses prevention of problems so that food products are safe to consume. The major concept underlying HACCP is that it focuses on prevention rather than inspection. The concept covers all types of potential food safety hazards, such as biological, chemical and physical threats. The success of the HACCP system depends on educating and training managers and employees in their roles to make food safer. USDA has mandated HACCP implementation for all meat and poultry producers in the United States and is providing training assistances through the 1862 and 1890 Land-Grant Institutions throughout the country.

METHOD – Pasture-produced poultry will be utilized to demonstrate a systematic approach to food safety in a very small processing operation at the A&T University Farm. This demonstration of an HACCP system for food safety management is designed to identify health hazards and to establish strategies to prevent, eliminate, or reduce their occurrence. This demonstration also will focus on biological such hazards as Campylobacter jejuni, and salmonella, and their controls.

DISCUSSION – HACCP is a systemic approach to the identification, evaluation, and control of food safety hazards based on these seven principles: 1) conducting a hazard analysis; 2) determining the critical control points (CCPs); 3) establishing critical limits; 4) establishing monitoring procedures; 5) establishing corrective actions; 6) establishing verification procedures and 7) establishing record-keeping and documentation procedures. HACCP plans for different operations will vary. In many situations, the plans will be product and process specific. To develop an HACCP plan, the following steps need to be taken before applying the HACCP principles to a specific product and process.

Step 1 – Form an HACCP team.
Step 2 – Describe the food and its distribution.
Step 3 – Describe the intended use of the food and the consumers using it.
Step 4 – Develop a flow diagram that describes the process.
Step 5 – Verify the flow diagram.
The Chicken Tractor Garden

RESEARCHERS – Dr. Willie Willis and Anthony Hooks

OBJECTIVE – The purpose of this demonstration is to show that poultry manure helps to develop a super-rich soil for vegetable production, thereby reducing the use of chemical fertilizers.

OPPORTUNITY – Today’s chemically intensive and tillage-oriented farming practices have resulted in soils that are deficient in organic matter, trace elements, and other nutrients. Consequently, animals and humans who eat these products from infertile soils are suffering from dietary deficiencies. One way to overcome these soil nutrient deficiencies is with the application of poultry manure. Throughout history, evidences suggest that livestock waste helps to reclaim and fertilize land faster. An alternative that is being researched at A&T is the chicken tractor, which lays down a nutrient-rich by-product before it becomes waste that creates disposal problems in the environment. This system provides opportunities for small gardeners to produce high quality vegetables, save on fertilizer costs, and enhance soil quality.

METHOD – A portable chicken pen containing 40 broiler chickens was pulled and rotated over pasture for about six months, depositing manure to the soil surface. The manure was allowed to compost in the field during the year. The strips were tilled and prepared for vegetable gardening. Three tracts were utilized, one with poultry waste fertilizer, another with chemical fertilizer, and the third contained no fertilizer. Broccoli, cabbage, corn, and peas were subjected to the three treatment groups during the spring and summer.

DISCUSSION – The chicken tractor garden can provide a small farmer with high quality chicken, wholesome vegetables and environmentally friendly practices. Farmers will benefit by not having to purchase expensive fertilizers. Chickens excrete an average of 75 percent nitrogen, 80 percent phosphorus and 85 percent potassium. A broiler chicken will consume about 15 pounds of feed over an eight-week period, excreting about 10 pounds of manure. Farmers can easily over-fertilize the soil with poultry waste. The results from this study and demonstration show greater performance for all vegetable crops raised on the poultry manure tracts.
High Tunnel Tomato Production


OBJECTIVE – To evaluate the use of high tunnels for the production of vegetable crops.

OPPORTUNITY – A high tunnel is a simple growing system used to enhance crop growth, yield and quality. High tunnels are constructed similar to greenhouses, but are unheated and lack the electrical components and automation of conventional greenhouses. High tunnels are normally used to extend the growing season in the spring and fall. This allows the farmer to stay in the market longer and thereby receive higher produce prices normally paid in the early and late season. Other benefits attributed to high tunnels are more even soil moisture, wind protection, warmer soil temperature, reduced chemical usage, and increased ability to use biological control.

METHOD – A high tunnel is a metal-framed Quonset shaped structure covered with a single layer of clear plastic. Drip irrigation supplies the water for crop growth. Research is being conducted at the Environmental Center of the A&T University Farm to compare the production of tomatoes (three heirloom varieties and one commercial variety) with and without high tunnels. The use of a landscape fabric as a mulch is also being compared in each system.

DISCUSSION – High tunnels are relatively inexpensive to build and operate. The system is most appealing to direct marketers, who can take advantage of having out-of-season produce which can be sold at a premium price. Research at other land-grant universities and experience of farmers indicate that high tunnels can extend the production season 2-3 weeks in both the spring and fall. Farmers can also use high tunnels to keep rainfall off plants. This keeps the leaves drier and thereby reduces disease problems. Farmers can supply the needed water through drip irrigation. This ability may allow farmers to grow difficult to produce vegetables such as heirloom tomato varieties and assist with organic vegetable production.
Pigs Are What They Eat: 
Producing Designer Pork for Niche-Markets

RESEARCHERS – Drs. C. Talbott and M. Worku; M. Jones, T. Barrios and 
J. Cope of N.C. A&T State University; Drs. T. See, J. Roberts, W. Gebreyes, 
M. Ashwell and J. Cassady of N.C. State University.

OBJECTIVE – To revitalize a once vibrant small-scale hog industry in North 
Carolina by developing alternative markets and production systems that 
promote sustainable farming practices and communities.

OPPORTUNITY – In less than one generation, North Carolina has lost 
more than 20,000 small-scale hog farmers (<100 hogs), and with it, their 
knowledge base. The importance associated with the loss of this resource 
may become even more pronounced as we face Homeland Security issues 
to ensure National Food Security. With this project, we hope to help small-
scale tobacco farmers find new markets and higher profit margins by raising 
swine in ways that may enhance pork flavor (through diet and genetics), as 
well as improving the nutritional value of pork fat (unsaturated vs. saturated 
fatty acids).

Additional project information can be obtained from your Extension Office 
or on the A&T SAES web page: http://www.ag.ncat.edu/goldenleaf/pork/
default.htm

METHOD – We compared phenotypes of progeny sired from four boar lines 
(not selected for lean gain) with the potential for improving intramuscular 
fat levels and pork quality. We also examined the potential to influence 
pork flavor utilizing alternative diets fed to breeds of hogs noted for having 
higher levels of intra-muscular fat. Our research also sought to develop 
farmer participatory research to produce high-end profitable pork, as well 
as provide marketing and technical expertise in developing healthy pork, 
niche-market/haute-cuisine pork, and a Porc de Season.

DISCUSSION – Preliminary taste panel and lab results from feeding 
alternative diets (peanuts, acorns, alfalfa all high in unsaturated fats) to 
Ossabaw (descendents of the Iberian hog) and Farmer’s Hybrid (five breed 
composite) hogs will be discussed as well as the potential to produce 
“healthy pork” by feeding diets high in unsaturated fats. Participants will 
sample pork to see if they can distinguish differences in taste from hogs fed 
barley as opposed to corn as the main carbohydrate source.
Improving the Quality of Soil Through the use of Compost, Cover Crops and Best Management Practices

RESEARCHERS – Drs. Charles W. Raczkowski, Keith Baldwin and G.B. Reddy

OBJECTIVE – This study will assess the combined use of compost, cover crops and no-tillage practices on the improvement in soil quality relative to conventional soil management practices.

OPPORTUNITY – Over the years, soil quality or “soil health,” has continually eroded as soil organic matter has decreased in farm fields across the state. There are many sustainable soil management practices that have shown promise for increasing soil organic matter in agricultural soils. Which of these practices and what combinations of practices are effective need additional study in the Piedmont region. In particular, we would like to know how organic matter affects the physical, chemical and biological processes of soil, and how improved processes can affect crop production over the long term.

METHOD – Treatments in this study differ in the amount of carbon added to the soil through combinations of soil management practices. In the fall, a composted mix of hatchery waste and poultry litter was applied, at a rate of 5 tons per acre. The compost was either left on the soil surface in no till plots or incorporated into the soil in conventionally tilled plots. In addition, a rye/crimson clover bi-culture was planted in the fall as a winter cover crop, and allowed to grow until a significant accumulation of biomass was achieved in late spring. A roller/crimper apparatus was used to kill and to press this cover so it would lay flat over the soil surface. The flattened biomass residue covered almost 100 percent of the soil surface. It was left over the surface in no till plots and incorporated in conventionally tilled plots. The study also includes no tillage and conventional tillage treatments without the use of compost and cover crops. Magic Lantern pumpkins were planted in all experimental plots in the first week of June.

DISCUSSION – An overall soil quality assessment will be conducted each year beginning in 2004. Quantitative indicators of soil quality will be measured using a number of physical, chemical and biological parameters of soil. Chief among these will be soil respiration, a measure of the activity of soil microorganisms, which contribute to nutrient cycling and plant health. The final results from the study will be used in a demonstration and training program on effective soil management practices and applications. The goals of this training will be to teach recognition of “desired soil quality,” provide “hands-on” experience using “soil quality indices,” and show how land management can significantly affect soil function, sustainability, and ultimately the quality and health of soil and the people who rely on it.
Protecting Our Soil Resource
Using Best Management Practices

RESEARCHERS – Drs. Charles W. Raczkowski, Keith Baldwin & G.B. Reddy

OBJECTIVE – The objective of this study is to determine soil management practices that reduce runoff and erosion in row crops. In this study, we are comparing a conventional, full tillage (plow/disk) system to a no-tillage with a winter cover crop system.

OPPORTUNITY – Two contributing factors that have been identified as major determinants of degradation of soil and loss of productivity in the southeastern Piedmont region are: (1) excessive soil losses from improper agricultural management; and (2) degraded soil physical properties from excessive tillage using conventional farming methods.

METHOD – The study began in 1994 and plans are to continue the experiment until the long-term performance of the systems under study can be fully evaluated. Soil management practices include no tillage and conventional tillage with and without the use of a winter cover crop. Unlike most investigations conducted in the Southeast, where soil erosion has been measured from simulated rainfall, this study was designed to evaluate runoff and soil loss from natural rainfall events.

DISCUSSION – The results obtained thus far support the claims of other regional investigators that the use of conservation tillage practices decrease runoff and increase crop productivity. Average reductions in runoff in no tillage relative to conventional tillage were 30 percent over a 10-year period. Most soil loss occurred during cropping periods, especially during heavy rainstorms following seedbed preparation and/or tillage. Conventional tillage was associated with 59 times more soil loss than no tillage during cropping periods (23.4 tons per acre vs. 0.4 tons per acre), and four times more soil loss during non-cropping periods (1.7 tons per acre versus 0.4 tons per acre). A loss of only 0.4 tons per acre per year is far below the acceptable soil loss rate of three tons/hectare/year, the standard set by the U.S. Department of Agriculture’s Natural Resources Conservation Service. Reducing runoff and soil erosion with no-tillage also decreased the loss of nutrients and herbicides from treatment plots. Crop growth and grain yield were generally greater with no tillage than with conventional tillage.
Seedless Watermelon Production


OBJECTIVE – The project is designed to evaluate the potential of two seedless watermelon varieties as alternative enterprises.

OPPORTUNITY – Production of seedless watermelons following legume cover crops has the potential to reduce both fertilizer input and the cost of production, while adding organic matter and building the soil for the long term. Cover crops will also control soil erosion and reduce weeds, diseases and pests.

METHOD – Two varieties of seedless watermelons were planted in May. The seedless watermelon varieties in the field trial include hybrid triploid watermelons, Summersweet and Superseedless. The pollinators are hybrid watermelon summer flavor varieties # 790 HQ and PVP 800. A cover crop of crimson clover and rye was planted in fall 2003, and allowed to grow until spring. In the spring, the cover crop was disked in and transplants that were grown in the greenhouse for five weeks were transplanted on raised beds with black plastic and drip tubes. Prior to planting, 400 pounds per acre of 10-10-10 fertilizer was broadcast, applied and incorporated. For weed control, six quarts of Prefar plus eight quarts of Alanap were applied (on a per acre basis) and incorporated prior to planting.

The raised beds are 70 feet long with two feet between the plants within the bed. Following transplanting, the beds were drip irrigated. Nitrogen (85 pounds per acre) and potassium (210 pounds per acre) were applied in fertigation through drip irrigation. Further evaluation of seedless watermelon quality and the cost of production are planned.

DISCUSSION – Relative yields of the seedless watermelon varieties and the quality will be determined and evaluated. The quality parameters that will be measured include sugar content, texture and water content. The seedless melons will be test marketed at the Triad Farmers Market and selected supermarkets. Desirable melon varieties will be chosen for future specialty crop diversification studies.
Intensive Grazing on Rotational Pasture

RESEARCHERS – Dr. Keith Baldwin and Donnell Cope

OBJECTIVE – Rotational grazing is defined as intensively grazing and then resting several pastures in sequence. Implementation of a rotational system requires dividing the land area into subdivisions called paddocks, and then moving animals from paddock to paddock, as forage species, annuals or perennials or mixes, are grazed productively. Doubling the forage utilization on a given acreage is often possible when changing from a continuous to a controlled grazing system. There is considerable profit potential for the producer willing to commit to an initial capital investment and increased management input. Profits improve because: 1) the stocking rate is higher; 2) the grazing season is longer; 3) there is less need for land dedicated to hay or silage production only; 4) there is less dependence on mechanical equipment; and 5) animal health improves.

OPPORTUNITY – This new system for managing livestock at the A&T University Farm has provided challenges that we are attempting to manage as we “learn by doing.” Challenges include: providing access to water as livestock are rotated sequentially through paddocks, training livestock to move to the energized fencing, adjusting stocking rates, and monitoring grazing duration of each paddock. A particularly important challenge is when to move animals from paddock to paddock. These decisions are based on the amount of forage available, size of paddocks, and estimated growth rate of the forage.

METHOD – Implementing a rotational grazing system at A&T required an investment in fencing materials. We purchased high-tensile electric fencing materials for perimeter fencing and charged this fence with a solar powered fence “energizer.” We’re using movable, cross fencing to divide a large, three-acre field into paddocks, and have planted a highly productive annual forage grass, hybrid sorghum Sudangrass, for grazing until frost. Moving livestock into this particular field, managed as “no-till” during the past two years, will lengthen a corn-soybean rotation and provide soil quality benefits to a field that has suffered from erosion and little organic matter input.

DISCUSSION – Pasture-based livestock systems appeal to farmers seeking lower feed and labor costs, and to consumers who want alternatives to grain-fed livestock production. Cattle can meet their nutritional needs on pasture and a profitable livestock operation can be built around animals harvesting their own feed. Instead of harvesting feed mechanically, storing it, and transporting it to the animals, rotational grazing allows cattle to be moved efficiently through a forage crop during its peak production period.
Cut Flower Evaluation

RESEARCHERS – Dr. Keith Baldwin, Grace Summers and Michael Rayburn

OBJECTIVE – At the A&T University Farm, the horticulture team participates in the annual North Carolina Annual Cut Flower variety trials. Species and cultivars featured in these trials are prominently displayed with other cut flowers that growers should consider for sales at local farmer’s markets.

OPPORTUNITY – Small-scale growers who market their crops at tailgate farmer’s markets may want to consider including cut flowers in their sales mix. Cut flowers can significantly increase Saturday morning market income when regular customers include a mixed bouquet or several sunflower “stems” among their purchases. Before getting started, growers should assess the market to see what cuts are being grown by other growers, when those crops are available, the quality and diversity of product in the marketplace, and the current prices paid by consumers. Growers should look for untapped opportunities in the marketplace and choose species, cultivars and production scheduling to avoid flooding the market and driving prices down.

METHOD – Both sunflowers and rudbeckia make good cut flowers. They have long, strong stems that are self-supporting, a wide planting window so that setting (and subsequent harvest) can take place over a long period of time, and a range of good colors. Most importantly, when treated properly after cutting, these flowers have a long vase life. Two sunflowers, Pro Cut Bicolor and Pro Cut Orange, are featured this year. Other proven performers and All-America award winners include: the Sunrich series, the Sun series, the Aura series, Ring of Fire, Soraya, Chianti, and more than 20 cultivars. Many of these varieties are “pollen less,” a trait consumers prize. In addition to sunflowers, look for Autumn Gold, Goldilocks, and Indian Summer, and Prairie Sun rudbeckia, and Benary’s Giant zinnias.

DISCUSSION – Growers should recognize that handling of cut flowers after harvest requires more attention than their actual production. Cut stems with a sharp knife during the cool part of the day and place them immediately in a clean, disinfected bucket of fresh water. Many growers strip leaves from the bottom half of the stem as they place them in the bucket, though this can be done after cooling. Use a commercial floral preservative in the water to prolong the vase life of the flowers. As soon as possible, place buckets of cut flowers in a refrigerated unit to remove field heat and preserve quality. Most cuts are harvested when blooms are approximately 50 percent open.
Sunnhemp as a Summer Cover Crop

RESEARCHER – Dr. Keith Baldwin

OBJECTIVE – There are some potential drawbacks to the use of sunnhemp (*Crotalaria juncea*) as a summer cover crop. The stems become increasingly fibrous after 60 days, and this may create residue management problems for small-scale growers who do not have heavy equipment to shred and incorporate the residue. Seed is also very expensive, and at recommended broadcast rates of 25- to 30-pounds per acre, seed may be prohibitively expensive at over $3 per pound. The purpose of this research project is to evaluate whether lower seeding rates can be used for this cover crop without sacrificing biomass production, and whether or not higher seeding rates result in prolonged succulence of plant stems.

OPPORTUNITY – Sunnhemp is a tall, herbaceous, warm-season annual legume that is used extensively for soil improvement and green manuring in the sub-tropics. When the seed is drilled, a canopy develops quickly, shading out and suppressing potential weed competition. After 45 days of growth, erect fibrous stems develop, remaining competitive with weeds. Sunnhemp grows rapidly and can produce 8,000 pounds of aboveground biomass (organic material consisting of leaves stems, etc.) per acre in 60 days. It has a high nitrogen (N) concentration at this growth stage, about 2.25 percent N. Eight thousand pounds of biomass with 2.25 percent N translates in 180 pounds of organic N per acre.

METHOD – At the A&T University Farm, sunnhemp was drilled at two rates (12.5 pounds per acre and 25 pounds per acre) in 0.5” deep in 5’ wide strips 165’ long. Biomass samples will be taken from six square foot mini-plots after 45- and 60-days to determine biomass production at the two seeding rates. Biomass will be analyzed for N concentration and mean biomass-N calculated for each treatment. Weed suppression will also be evaluated in each treatment.

DISCUSSION – In a previous sunnhemp trial at the Upper Piedmont Research Station in Reidsville, sunnhemp planted June 1, July 1 and August 1 produced 2,500 pounds, 5,000 pounds and 7,000 pounds of aboveground biomass, respectively, after 45 days of growth. The N concentration in the biomass was 2.9 percent, 2.9 percent, and 3.4 percent, respectively. This cover crop has tremendous potential for use as a summer cover crop that can provide significant biomass and biomass-N in between fall and spring vegetable crops, in effect providing a “triple crop” opportunity to growers. It can tolerate poor, sandy, droughty soils but requires good drainage.
A&T Lettuce Trials

RESEARCHERS – Dr. Keith Baldwin and Grace Summers

OBJECTIVE – The key to increasing income from lettuce sales at farmers’ markets is to stagger planting so that lettuce is harvested over as many weeks as possible. Growers can attempt this by bringing lettuce to market after the “normal” availability window has passed. Heat-tolerant varieties that resist bolting and bitterness are available, but research is needed to determine which cultivars perform best in the North Carolina Piedmont region. Enhancing income from lettuce sales can also occur when the lettuce is grown organically. Researchers at the A&T University Farm are examining different organic fertilizers in order to provide nutrient management recommendations to organic lettuce growers.

OPPORTUNITY – Leaf lettuce is a profitable crop for small growers who sell at farmers’ markets. Consumers are willing to pay more than $1 per head for farm-fresh, high quality lettuce. Local growers commonly plant lettuce in three rows on wide beds with plants one foot apart in the row. A bed that is four-feet wide and 100 feet long will accommodate approximately 300 lettuce plants. At $1 per head, the gross return to the grower from a bed this size can be as much as $300. That’s a highly profitable return from such a small area.

METHOD – Lettuce research projects at A&T in 2004 are focusing on:

1) Performance, quality, and heat tolerance of red-leaved lettuce cultivars, such as Blackjack, Dark Lollo Rossa, Firecracker, Galactic, New Red Fire, Rave, Red Sails, Red Salad Bowl, Ruby Ruffles, and Vulcan;
2) Performance of so-called heat tolerant cultivars that are planted late, such as Dano, Red Salad Bowl, Royal Oak, Salad Bowl, Sunfire, Tango, Buttercrunch, Ermosa, Esmeralda, Marvel of Four Seasons, Nancy, Optima, and Red Cross;
3) Comparisons of soybean and feather meal to each other and to ammonium nitrate fertilizer applied to Romaine lettuce cultivars, Cimmaron, Eruption, Freckles, Green Forest, Green Towers, Ideal Cos, Parris Island Cos, Rosalita, and Rough D'Hiver on two different mulches - white and paper.

DISCUSSION – Many organic lettuce growers are using soybean meal or feather meal to supply nutrients. Growers typically base the application rate of these two materials on their total nitrogen (N) concentration. However, not all of that N may be released from these materials to the lettuce crop. Growers must adjust their application rate by assuming that some fraction of the total N concentration will be available when the crop needs it. Weed control is also a problem for organic lettuce growers. Paper mulches may be a viable alternative to plastic mulches, which present waste disposal problems and are derived from limited petrochemical resources.
Organic Heirloom Corn Production

RESEARCHER – Dr. Keith Baldwin

OBJECTIVE – The demonstration of heirloom corn production includes organic production strategies that seek to increase soil organic matter content, use cover crops to provide nutrients for the following crop, and reduce tillage to improve soil quality.

OPPORTUNITY – Recent buyer surveys indicate that there is more demand for organically grown grain than there is supply in North Carolina. Organically grown grain for feeding organically produced livestock is in short supply in the state, and grain growers will benefit from an “organic premium” when they sell grain into this market.

METHOD – Summer cover crops were grown in 2003, and later that September winter cover crops were planted. These cover crops included cereal rye, crimson clover, hairy vetch, Austrian winter pea, and arrowleaf clover. The last three cover crops did very well, growing enough above-ground biomass to provide all the nitrogen (N) needed for the heirloom corn that was planted this spring. The crimson clover and the rye performed poorly and supplemental N as compost was added to this section of the field to improve soil for future cover crops and to provide N for the corn.

The cover crops were killed mechanically by rolling, except for the crimson clover which was left standing. In an effort to reduce tillage, the killed cover crops were not incorporated. The seedbed was prepared for an heirloom corn variety, Carolina Gourdseed, by using a two-row strip till unit. The cover crop residues left between the tilled strips will help conserve soil moisture, suppress weeds, provide “slow-release” N, and provide valuable organic matter to increase microbial activity (which contributes to root growth) in a zone just underneath the surface of the soil.

DISCUSSION – In addition to meeting a need in the organic market, small mills that require supplies of niche grains to mill and market as “value-added” products are also being opened. One such facility, Anson Mills, is milling and marketing “old-time” grits produced from heirloom corn varieties. These products can be considered value-added because they come from a small-town, specialty mill, reflect heritage and history, and, in Anson Mills’ case, because the grits are “certified organic.” Faculty members at A&T are excited about the partnership with Anson Mills, which provided seed to demonstrate and produce organic grain. In an effort to improve the genetics of these open-pollinated cultivars, selections will be made for high quality ears when the grain is mature.
Recommendations for the use of chemicals are included in this publication as a convenience to the reader. The use of brand names and any mention or listing of commercial products or services in this publication does not imply endorsement by North Carolina State University, North Carolina A&T State University, or North Carolina Cooperative Extension nor discrimination against similar products or services not mentioned. Individuals who use chemicals are responsible for ensuring that the intended use complies with current regulations and conforms to the product label. Be sure to obtain current information about usage regulations and examine a current product label before applying any chemical. For assistant, contact an agent of North Carolina Cooperative Extension.

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