SOIL & CROP SCIENCES GIG'EM AGGIES! WHOOP!
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Changing Seasons

C. Wayne Smith

I'm looking forward to serving the state wide Research, Teaching and Extension faculty and staff of the Department of Soil and Crop Sciences in the coming months as Interim Department Head. I have a steep learning curve ahead of me and I'm sure that I will be calling on many of you for information and support in the coming weeks. I also look forward to maintaining and strengthening our ties to our clientele, from farmers to commodity leaders to business leaders to consumers.

Some faces in the faculty and staff ranks across the state have changed since I arrived in Soil and Crop Sciences 19 years ago. Many have retired, many new folks have been hired, many of us look just a little bit older than we did in 1986. However, several things have not changed and I hope they never do. One is that this is a Department dedicated and determined to do what is right and to do it for the right reason. No one will every convince me that you are not driven by a desire to help others; to elucidate the mysteries of crop improvement and production; to understand the physical/chemical/microflora characteristics of our soils; to extend the scientific knowledge of production to the producers of our state and national bounty; to find ways to derive the maximum heath benefits from the foods we produce; to understand the intricacies of crop growth; to improve the aesthetic beauty of our state, and to improve and maintain the natural resources that provide and sustain life.

I also appreciate the attitude each of you bring to your work. An attitude that says I will not be defeated today. This has been referred to by others as a can do attitude and it is an attitude that makes working with each of you a real pleasure.

Let me address two other components of our Department, those being our former and current students. Our reason for being a University is education. We will never forget that. For those of you who are former students, we hope to continue to build our relationship. We want to know your successes; for your success is our success. We want to know how we can continue to support and educate you through Continuing or Distance Education offerings or through more traditional Extension efforts. For those of you reading this newsletter who are current students, undergraduate or graduate, I want you to know that we value your contribution to our Department. I encourage all of you, former or current, to call or visit with me about concerns or ideas for improvements in Soil and Crop Sciences.

"Call or visit me about concerns or ideas for improvements."

Together, we serve the tri-mission of the Land Grant System; Teaching, Research, and Extension — all equal and all equally important. All faculty and staff across the state are to be commended for what they do, day in and day out. I can only promise to do my best over the next few months to help each of you do what you do best, serve Texas agriculture. In return, I hope that each of you will help me "steer the ship" during this

Dr. C. Wayne Smith, Interim Department Head

For story information or contributions, contact t-hons@tamu.edu.

SOILS CRITIQUE

The Annual Soils Critique for 2005 is being hosted by the TAMU Research & Extension Center at Corpus Christi on May 24-26.

For further information contact John Matocha 361.265.9201

Meet Gaylon Morgan

Gaylon Morgan fishing with his dog, Paco.

Gaylon Morgan is a native Texan. His home town is Rockdale, approximately 55 miles west of College Station. Gaylon's father and mother work at ALCOA and Rockdale High School, respectively. His older brother, Scott, who has a wife and two children, live in Rockdale. His younger sister is a teacher at Rockdale elementary school and is married with two children. Gaylon's wife, Cristine, is a Soils faculty member specializing in hydropedology research and teaching. They were married in 1999 and are enjoying living in Burleson County. They have a dog named Paco and a horse named Peanut. "I am very fortunate to have the love and support of my wife and family." Gaylon said.

"I knew Texas was big, but not unitl I was responsible for the whole state, did I truly appreciate its size."

Gaylon's hobbies include hunting large and small game, fishing, canoeing, and managing their property for wildlife. "I just enjoy being outdoors."

He received his B.S. degree from Texas A&M University in Agronomy. In the fall of 1996, Gaylon began graduate school under the supervision of Drs. Paul Baumann and Mike Chandler in the area of weed competition in cotton. Following his M.S. degree, Gaylon went to the University of Wisconsin in Madison to pursue his Ph.D. degree in Horticulture and a minor in Plant Pathology. His research project focused on pests (weeds, disease, and insects) on a landscape in production potato, soybean, and corn fields. The research objective was to identify site-specific management options for pests in agricultural fields using precision agricultural tools, including GPS, GIS, and remote sensing. Following graduation in 2001, Gaylon began his academic career (70% research, 30% teaching) as Assistant Professor and Systems Agronomist at the University of Tennessee. In Tennessee, his research focused on cropping systems and forage crops. In 2003, he was hired as Assistant Professor and State Extension Small Grains Specialist for Texas Cooperative Extension, where he has statewide responsibilities for wheat, oats, barley, rye, and triticale. Gaylon says "I knew Texas was big, but not until I was responsible for the whole state, did I truly appreciate its size and diversity."

As Assistant Professor and State Extension Small Grains Specialist, Gaylon is responsible for statewide educational programs for the small grain producers within the state. In his words "the objective of my job is to provide relevant, timely, and accurate information to every small grain producer across the state." In order to provide educational information to producers, it requires a cooperative effort with specialists on campus and at the Research and Extension Centers to make the educational events successful. Additionally, applied research being conducted by research and extension faculty is essential to answer the questions of the clientele. His primary areas of interest and applied research include reduced tillage systems in wheat, weed and disease management, variety evaluation, and small grains for forage. We have extension demonstration and applied research plots scattered throughout the state. Gaylon is also coordinator for the uniform variety trials wheat and oats (21 locations), working closely with Jackie Rudd, wheat breeder in Amarillo.

Gaylon currently has two M.S. graduate students, Jacob Shaffer and Justin Sladek who are working on research projects in small grains.

Award Winner

Congratulations John Matocha! He received the National Award for the Outstanding Conservation Tillage Researcher in Cotton for 2005. The award was presented at National Conservation Tillage Conference for Cotton and Rice in Houston.

One Stop Shopping

Travis Miller

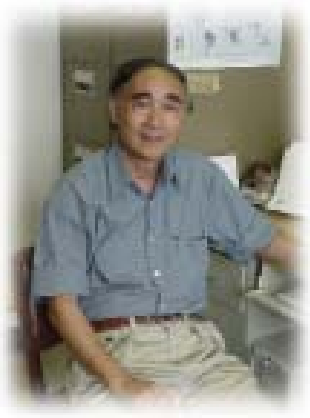
Many of the faculty in the Soil and Crop Sciences Department dedicate significant amounts of their time in the development and/or the evaluation of crops, forages and turfgrass to identify genetics with superior properties to either improve quality or yields in stressful growing conditions found in our state. These stresses include those that are related to the environment, such as heat and drought stress, and those associated with pests, including insects and diseases. As stresses and pests impacting yield and quality vary with location, trials are designed and implemented at many locations to give scientists and growers information on the local adaptation and potential economic returns within their geographic region. Much of the yield increases that we have seen in commodities over time are related to genetic improvements. Faculty in the Soil and Crop Sciences Department, often in collaboration with faculty from other departments, as well as the farmers and ranchers in the state of Texas, annually conduct hundreds of trials and observations to examine the genetic potential of field crops, forages and turfgrass in assessing their adaptation to field conditions in the state. In order to make the results of these trials, production and pest management information available in a single, one stop shopping site, http://varietytesting.tamu.edu was created.

More than yield trials are provided to give growers tools to use in their management processes.

This site allows the user to review a large amount of information on agricultural commodities, focus on performance information nearest to their growing conditions and review data related to performance of hybrids and varieties of crops, forages and turfgrass. Along with these yield trials, fact sheets, bulletins and links are included to give growers information they can use on other management considerations.

Information and variety tests may be submitted to lizhang@ag.tamu.edu for inclusion in the website.

varietytesting.tamu.edu is the newest site developed in Soil & Crop Sciences.



Goodbye Tony Juo

Frank Hons

Anthony (Tony) S.R. Juo, 68, of Maui, Hawaii, passed away suddenly on April 12, 2005, following a serious illness. He was a pioneer of agricultural development in Asia, Africa, the Caribbean, and Central and North America. Tony was born in Shandong in northern China in 1936. His family moved to Taiwan during WWII to escape the Japanese invasion, but was unable to return to China because of the Communist revolution that followed. He graduated with a B.S. in 1959 and M.S. in Agricultural Chemistry in 1961 from Tai Da University in Taiwan. Tony received his Ph.D. in Soil Chemistry from Michigan State University in 1967, and completed a postdoc at Purdue University. It was during this time he met his future wife, Rosalind.

During his college years, Tony's outlook was influenced by the great humanitarian, Albert Schweitzer, and he dedicated his life to alleviating suffering in the Developing World. His career in tropical agricultural research and natural resource conservation began in 1970 when he joined the International Institute for Tropical Agriculture (IITA) in Nigeria, West Africa, as a Soil Scientist, serving more than 17

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Urban Nutrient Management

Tony Provin
John Pitt

"Many homeowners have adequate nitrate-N in their soil to forgo at least one application of nitrogen fertilizer during the growing season."

For more than two decades, significant focus has been placed on improving nutrient management in agricultural enterprises. Both Extension and Research faculty have worked together to successfully address many of the major nutrient management issues facing agriculture. The 1992 revisions in the Federal Clean Water Act not only continued the focus on agriculture, but put in place legislation geared toward addressing water pollution from municipal sources. Initially, the most visible impact that municipalities observed from this legislation was the mandate to improve waste water treatment plants. Another important component of this legislation was the phasing in of stormwater discharge monitoring and contaminant limits. A number of municipalities have observed seasonal spikes in phosphorus and nitrate-N, and/or continually elevated levels of these nutrients in streams fed by residential watersheds.

A recent review of urban soil testing data generated by the Texas Cooperative Extension Soil, Water and Forage Testing Laboratory suggests many homeowners who submitted soil samples have adequate nitrate-N in their soil to forgo at least one application of nitrogen fertilizer during the growing season. Furthermore, mean extractable phosphorus levels were over five times higher than the highest level where any expectation of plant health and growth was anticipated. This mean phosphorus level also exceeds Texas Commission for Environmental Quality's regulatory

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Goodbye Tony Juo Continued

years in that capacity. While at IITA, Tony adopted a holistic approach to solving Africa's food and environmental problems. This would become the basis of his life's work.

Memorials are suggested to the Lombardi Cancer Center at Georgetown University, 3800 Reservoir Rd., NW, Washington, D.C. 20007.

Dr. Juo already was an internationally-renowned soil chemist when he joined the Department of Soil and Crop Sciences at Texas A&M University in 1988 as Full Professor. He was Coordinator of TropSoils, an international program for soil management at Texas A&M University, which was a consortium of universities including Cornell University, North Carolina State University, The University of Hawaii, and Texas A&M University. He successfully assembled a cadre of international scientists and faculty who worked together to promote multidisciplinary research, education and project planning in international agriculture. His outstanding international reputation, his cutting-edge research vision, and his ability to build a consensus among national and international institutions, made him a leading world statesman who significantly influenced the direction of agroecosystem research. During his career, Tony collaborated with colleagues and governmental representatives from Africa (Niger, Nigeria, Mali, Cameroon, Liberia, Sierra Leone, Ghana, Zaire, Kenya, Togo, Madagascar, Burkina Faso), Asia (Japan, China, Taiwan, Thailand, Philippines, Indonesia, India), Latin America (Honduras, Brazil, Colombia, Peru), the Caribbean (Jamaica, Haiti) and Europe (United Kingdom, Belgium, France, The Netherlands, Germany, Holland).

Tony received many awards and accolades during his career. He was a Fellow of both ASA and SSSA and also received the International Agronomic Award and the International Soil Science Award from these respective organizations. ■

Besides being a world-class scientist, Tony Juo was also an intellectual, a philosopher, and an historian. His interests and pursuits were many and varied. He was an avid bridge player and golfer, and his smile, wry sense of humor, and positive outlook were his trademarks. He retired from Texas A&M University in 2002 and settled in Maui with Rosalind. During retirement he worked in his garden, attended concerts, golfed, and hosted family and friends.

Tony is survived by his wife, Rosalind; their two children, Jennifer (Garth) Bradley and Peter (Jasmine) Juo; and two grandchildren, Ethan and Devon Bradley. ■

Urban Nutrient Management Continued

threshold for soil test phosphorus in many permitted agricultural and industrial operations. Unlike over application of nitrogen fertilizers that ultimately may be used by plants or entirely removed from the soil through leaching and runoff, excessive soil phosphorus may result in decades long leaching and runoff of small concentrations of phosphorus. In addition to the duration differences between phosphorus and nitrate-N contamination potentials, the absolute regulatory threshold concentrations are also vastly different with levels of three parts per million nitrate-N and as low as 0.025 part per million for phosphorus.

Texas Cooperative Extension's *Don't Bag It* program, implemented in the late 1980's, successfully altered many homeowner's attitudes toward the bagging of clippings and fertilization requirements of turfgrass. While the program stressed soil testing and included a soil testing component, adoption of soil testing by urban clientele was limited. The standard recommendations for fertilizer selection was, in the absence of a soil test, apply a 3-1-2 or 4-1-2 ratio fertilizer. While the recommendations of these ratio fertilizers was an improvement over the historically utilized 8-8-8 or 13-13-13, the return of clippings in addition to the continued application of phosphorus has resulted in a consistent increase in the average homeowner's soil phosphorus levels.

Since 2000, the Soil, Water and Forage Testing Laboratory has worked with county Extension agents, Master Gardener groups, and municipalities to create interest in managing urban nutrients. One mechanism has been through the use of urban soil testing campaigns. The campaigns have included discounted analysis fees, combined with educational events. Recently, the Soil, Water and Forage Testing Laboratory, Travis County Cooperative Extension, and the City of Austin worked with Travis County area garden centers to promote and support an urban soil testing program. Faculty from Soil and Crop Sciences provided an educational program to retailers and volunteers who would aid homeowners in interpreting reports and selecting fertilizers. The laboratory received 489 soil samples. The samples represented a very diverse cross section of Travis County including samples from new construction, established lawns and gardens. The mean phosphorus level from samples analyzed was 245 parts per million with a range from 13 to 993 parts per million, a range strongly supporting the need to test individual lawns and gardens instead of using a generic fertilizer recommendation.

Soil and Crop Sciences faculty and Travis County Extension have forged a strong working relationship with the City of Austin. Both turfgrass and soil science faculty have worked closely with the city since early 2000 to address the need to reduce nitrate-N and phosphorus concentrations in the Stillhouse Creek watershed. This 30+ year old subdivision consists of 208 residences whose lawns drain into the nearby stream. Through annual soil testing, reduction in application rates of nitrogen fertilizer and the city's free fertilizer program, we have observed a 70% reduction in mean high nitrate-N peaks in Stillhouse Creek.

Additionally, surveys of residents in this watershed indicate an 83% improvement in the awareness of nutrient loading issues.

In the past three years, a number of states and municipalities have begun to require homeowners to show a recent soil test prior to purchasing fertilizer. In most cases, this requirement has been enacted due to concerns over sensitive watersheds or existing nutrient contaminations. In Texas, the concern over urban fertilization practices is not limited to the environmentally sensitive Austin areas. Faculty in Soil and Crop Sciences are currently reviewing turfgrass fertilizer recommendations to insure both environmental concerns and turfgrass performance are addressed.

> Some states are requiring that you show a recent soil test prior to purchasing fertizer.

Texas A&M University Soil, Water & Forage Testing Laboratory

Serving Agricultural & Urban Clientele with Research-Based Analysis

Recently, the Soil, Water and Forage Testing Laboratory, Travis County Cooperative Extension and the City of Austin worked with Travis county area garden centers to promote and support an urban soil testing program.

soiltesting.tamu.edu

Residual Nitrogen Could Save Millions

Frank Hons, Mark McFarland, Robert Lemon, R.L. Nichols, Randy Boman, Vince Saladino, Frank Mazac, Rick Jahn, Jeff Stapper, and Kevin Bronson

Cotton growers have had to become increasingly more efficient in order to sustain profitable farming operations.

Cotton is the major agronomic cash crop in Texas. Approximately 6 million acres are planted each year, with an overall annual statewide economic impact of about $6 billion. Growers have had to become increasingly more efficient in order to sustain profitable farming operations. Keys to producing maximum economic cotton yields include optimizing inputs such as fertilization, irrigation, pest management, and selecting the best-adapted varieties. Nitrogen (N) is usually the most important fertilizer nutrient applied to cotton, but it is also often the most difficult to manage. Accurately predicting the fertilizer N requirement of a crop is difficult because N can undergo chemical changes which influence its retention and mobility in the soil and its availability to plants. Nitrogen leaching, denitrification (conversion to a gas), ammonia volatilization (conversion to a gas), and mineralization and immobilization (release and tie-up of N by soil microbes) are processes that can quickly alter the quantity of plant available N in soils.

Nitrogen is the most difficult nutrient to properly manage.

The amount of N needed by cotton, and other crops, depends on yield. Recommended N rates are based on the quantity of N required to produce a crop at a realistic yield goal, and are reduced by the amount of residual soil nitrate (NO_3) to a specified depth in the profile. Texas Cooperative Extension recommends that 50 lbs N/acre be available from all sources for each bale of lint produced. Crops obtain N from applied fertilizer, soil mineral N, chiefly NO_3, and N mineralized (released) by biological processes from soil organic matter. Each of these is acquired by the crop from the soil with potentially different efficiencies. Of these sources of N, only the amount of fertilizer N applied is accurately known. Nitrogen comprises about 5% of the organic matter of most mineral soils. There are large reserves of organic nitrogen in many soils, but organic matter releases mineral N slowly. Since N is released by microbial action, the rate of release depends on biological properties as modified by soil and climatic factors. The principal form of soil mineral N is NO_3, and NO_3 is highly dynamic in the soil. So, the result of a soil NO_3 test is a point-in-time estimate and should be obtained as near the time of planting/crop demand as possible.

To better predict the amount of soil N being released from organic matter, a six-year study was conducted across the major cotton producing regions of Texas with its major objective being the development and evaluation of a rapid procedure for estimating mineralizable soil N. Such an estimate of mineralizable N, along with residual NO_3, could then be used to improve the accuracy of N fertilizer recommendations. However, results of the study were difficult to assess because large amounts of residual NO_3 found in soils at many of the study sites precluded a crop yield response to added fertilizer N. Crops at only 13 of the 55 sites studied, or less than 24%, responded to the addition of any fertilizer N. Nitrogen application rates ranged from 0 to 150 lbs N/acre in 50 lbs/acre increments. Below normal rainfall contributed to lowered response in some years, but the major contributing factor appeared to be high amounts of residual NO_3 in soils. Residual soil nitrate measured to a depth of 4 feet exceeded 100 lbs N/acre on 33 of the 55 sites and supplied the N necessary for optimum crop yields at those locations.

These results clearly indicate the need to account for residual NO_3 when making annual fertilizer recommendations. While deep sampling to 4 feet is most desirable (but generally not feasible), amounts of fertilizer N required likely should be reduced by quantities of residual soil NO_3 present in the soil profile to at least a 2-ft depth. Additional research is needed to determine removal of residual NO_3 by plants from different soil depths. In addition, any NO_3 that will be added in irrigation water also should be credited. These quantities of NO_3 can readily be determined through soil and water testing.

High levels of residual soil NO_3 can be present in agricultural soils. In addition to crop failure, likely reasons include unrealistically high yield goals

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Soil Basics 101

Soils are vital, fragile, finite natural resources that are essential for the sustained production of food and fiber. Soils, however, are subject to degradation and erosion when mismanaged. Between 1950 and 1993, grain area per person worldwide decreased from 0.58 to 0.33 acres (0.23 to 0.13 hectares). As human populations increase, soil resources are used more intensively, with increasing probability that many practices will lead to deterioration of the resource. Competition between agricultural uses and nonagricultural uses of land, such as support of structures, disposal of wastes, and growing plants for recreational and aesthetic purposes will increase.

Ecosystems have interdependent relationships.

In ecosystems, soils, water, air, plants, animals and people have interdependent relationships. Soils are dynamic, living systems whose productivity, through management that often includes additions of nutrients, organic materials and water, can be sustained indefinitely. Soils exhibit unique physical and chemical sorptive qualities and dynamics reflective of their inorganic and organic composition. Cycling of carbon, nitrogen and other nutrient elements in nature involves transformations in soils.

Great diversity occurs among soils, sometimes in very small geographical areas, such as building lots in urban areas. The rise and fall of civilizations sometimes have been related to the wise use and misuse of natural resources including soil and water.

Definitions of soil vary, but one view is that the unconsolidated material at the earth's surface becomes soil when biological activity results in a noticeable accumulation of organic matter as revealed by a dark surface color. Soils that form in loose, fine-grained material weathered from the rock immediately below them are called residual soils. More frequently, soils are formed in materials that have been transported away from the source rock. Examples of such materials are alluvial materials, which have been deposited from running water as in flood plains or deltas; lacustrine material which is deposited in lakes; glacial material which has been moved by ice, and aeolian material which has been transported and deposited by wind.

Many of the intensively used soils in the world are formed in transported materials. Their usefulness often is associated with topography, or with physical and chemical properties inherited directly from the transported material.

Read more lessons on Soil Basics at:

http://organiclifestyles.tamu.edu/soilbasics/index.html

Residual Nitrogen Continued

that result in over application of N, fertilizer N applied several weeks or months before planting, and failure to monitor residual NO_3 by soil sampling on a regular schedule. Alteration of these practices, along with proper sampling and testing to determine recommended N rates for cotton and other crops, should help alleviate this situation while reducing N input costs. A very conservative estimate of cost savings based on the current price of N fertilizer suggests that accounting for residual soil NO_3 could save Texas cotton producers at least $60 million annually.

UPCOMING FIELD DAYS

Luling Foundation Field Day

June 17

Stiles Farm Field Day

June 21

Corpus Christi Research & Extension Field Day

June 21

Eagle Lake Field Day

June 28, 4:00 p.m.

Garret Farms Rice Field Day

July 5, 3:00 p.m., Danbury

Beaumont Field Day

July 14, 8:00 a.m

The Heep Center Gets A Makeover

Kathy Schmitt

Last year I submitted a grant proposal to The Heep Foundation asking for funds to make improvements to the Heep's namesake and the home of Soil & Crop Sciences and Entomology. Thankfully, it was approved and we will spend the monies to make improvements to our workplace – where lots of us spend many hours. The goal is to make The Heep Center a warmer, friendlier, and more comfortable environment for all that come here.

Students enjoy the changes made around the Heep Center.

Two years ago, Tami Hons, our website administrator, started this effort by donating funding for the fountains and plants in the first floor atrium. The Heep Improvement Grant will further help to achieve the above goals.

So far this grant has provided us with reupholstered cushions, a study cubicle, table, recovered bulletin boards, chairs on the second floor, and wrought iron planters and plants. Eventually, there will be more wrought iron planters as well.

Ed Riley, associate curator of the Entomology Museum, has also created a wonderful display in a lighted glass case with a poster and bulletin boards to highlight a corner of the second floor.

All suggestions and comments are welcome for future changes.

Photo taken along the Independence Highway near Brenham, Tx.

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