SOIL & CROP SCIENCES GIG'EM AGGIES! WHOOP!
TEXAS A&M UNIVERSITY
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Three children orphaned after their mother, Pinjira Begum, died of Arsenic poisoning. They too, are arsenic infected.

Generations Gone

Bhajan Biswas and Richard Loeppert

It started as a dream. The dream to provide safe drinking water to 100% of the people of Bangladesh turned to action in the 1980's by promoting groundwater as a source of safe drinking water. The advocacy of this well-intended effort was driven by the United Nations International Decade for Water Supply and Sanitation. Nevertheless, the result was a tragic page in history.

In 1992, a group of scientists from the School of Environmental Studies (SOES), Jadavpur University, India, while working on groundwater arsenic contamination in West Bengal, India, observed something unusual in a village in West Bengal. In one family, none of the members showed arsenic toxicity symptoms except a woman who came to West Bengal from the village of Satkhira district, Bangladesh, after marriage. The woman revealed that many of her relatives in Bangladesh had similar arsenic symptoms. She had also seen similar symptoms among a few of her neighbors and in some people living in two other neighboring villages. The SOES, in its report on West Bengal, India's arsenic calamity, stated that Bangladesh also, in all probability, was arsenic-affected.

The severity of the arsenic poisoning in Bangladesh surfaced after an international conference held in February 1998 in Dhaka, Bangladesh. In February 1998, the Guardian (UK) detailed the degree of arsenic contamination in Bangladesh and drew the attention of scientists worldwide. The local chief of the World Bank stated, "tens of millions of people are at risk", and "43,000 villages out of 68,000 are presently at risk or could be at risk in the future". In the same report, the World Health Organization (WHO) was quoted to have predicted that within a few years death across much of southern Bangladesh (1 in 10 adults) could result from cancers triggered by arsenic. The British Geological Survey also reported in early January 1999 that approximately 21 million people in Bangladesh were drinking arsenic-contaminated water, with more than 50 µg arsenic L^{-1}. The Bangladesh government has estimated that 35 million inhabitants of Bangladesh drink arsenic-contaminated water above 50 mg arsenic L^{-1}. The risk of using such arsenic-contaminated water can be understood by reading a report published by the U.S. National Research Council. The report stated that exposure to 50 µg arsenic L^{-1} could easily result in a combined cancer risk of 1 in 100. The risk estimate for 500 mg L^{-1} of arsenic in drinking water is 13 per 100 person's USEPA revealed that arsenic is a persistent, bio-accumulative and toxic substance. In addition, arsenic is a carcinogen (cancer-causing substance) and is among the top 20 most toxic substances identified by the U.S. Agency for Toxic Substances and Diseases Registry. At present, the arsenic contamination in Bangladesh is considered the world's largest mass poisoning in the past hundred years.

> "43,000 villages out of 68,000 are presently at risk "

To realize that "43,000 villages out of 68,000 are presently at risk or could be at risk in the future" is a profound human tragedy. This population of south Asia is fast becoming an endangered generation. You have to see their faces and know their many stories.

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

Bangledesh Crisis Continued

Real Life Stories

Ranu, an arsenic orphan and patient living in poverty.

In 1996, there was an arsenic orphan named Ranu, age 15. She lived in the village of Samta, District, Jessore, Bangladesh. She lost all of her family members due to arsenocosis. Now she is surviving like a slave working for her neighbors. She is also a serious arsenic patient and "waiting to meet her family members in heaven."

Beauty, age eight, was living in the village Ramkrishnapur, District Kushtia, Bangladesh. She was also a serious arsenic patient with melanosis on her whole body which hid her real beauty. When visited years later, her situation was more serious and she was fighting to live from internal cancers but with little hope for doctors to save her after a lifetime of drinking arsenic-contaminated water (with more than 1000 µg arsenic L^{-1}).

In the village of Charghat, Rajshahi District, Bangladesh, a woman named Pinjra Begam, (Pinjara means cage, Begam means queen). was married at the age of 15. Masud Rana said, "Pinjara was pretty when she married my son." After marriage, she developed melanoses and within 2-3 years, she developed skin lesions and her health deteriorated rapidly. Pinjara then developed lung cancer and was hospitalized at Rajshahi Medical College. Pinjra had a daughter, Sapla (age 7), who has skin lesions, a son Arif (age 5), and another son, Jyoti, who is eight months old. Arif and Jyoti have no skin lesions, but both have high arsenic concentrations in their hair and nails and also are expected to develop arsenic symptoms. Pinjra's condition worsened after her last child was born. Finally, Pinjra died and left three arsenic orphans behind, a common tragedy in Bangladesh.

The Cause and Effect

During the past three decades the arsenic crisis has worsened in Bangladesh, attributable to the combination of natural geologic processes, changing water-use patterns by man, and environmental mismanagement. Similar problems exist around the world and virtually no continent is unaffected, but the problem is especially severe in Bangladesh and West Bengal, India. In Bangladesh, the arsenic contamination is mainly attributable to natural geological processes, though the activities of man have strongly affected both the severity of the risk and will impact the potential success in eventually mitigating the contamination.

> "Groundwater is their sole source of drinking water ."

The major risks of arsenic contamination are through ingestion of arsenic in drinking water which can dramatically impact human health. A second major risk is from arsenic in irrigation water, which impacts arsenic in the food chain, food quality and security, and long term agricultural sustainability. A major problem in Bangladesh is that arsenic contaminated irrigation water is brought from the subsurface to the surface where it directly impacts agriculture.

Researchers working with local people in Bangladesh.

The Response

The international scientific community, including scientists at Texas A&M, has responded to the arsenic crisis. In 2001, scientists from the Soil & Crop Sciences Department at Texas A&M University partnered with scientists from Cornell University and CIMMYT, as well as scientists at the Bangladesh Agricultural Research Institute (BARI), the Bangladesh Rice Research Institute (BRRI), the Bangladesh Institute of Nuclear Agriculture (BINA) and Bangladesh Agricultural University

Continued Next Page

Children of The Corn

Tami Hons

Generations of farm families are getting more creative than the last. They are being forced to look beyond the boundaries of traditional farming just to hold on to their legacy.

Dave Fryer, 24, said: "When I was growing up here there were six farms on the same road, now we are the only one left. We had to come up with an idea to keep us farming and something that was fun."

Some families are turning to Don Frantz, President, The American Maze Company. His company is dedicated to bringing 'agri-tainment' to the American landscape, in doing so they promote Agri-tourism and the respect for our agricultural resources. "There is no more interesting cause than to help secure the future of a working farm or a living history farm park."

His company licenses and franchises maze designs to farm/owner operators. Each year, farm owners work with a team of imagineers from the American Maze Company to select a theme, like a space cobbyse, take me out to the corn field, or giddy up and get lost! A number of factors, including audience, educational opportunities, marketing viability, and product tie-in are considered in the selection.

Bill Geist reports that "City slickers are paying farmers good money to get lost in their corn fields." Some farms report 24,000 visitors per year. Families, youth groups, "children of the corn", are all given a puzzle board that serves as a map. Maze-goers collect pieces of the puzzle along the way. If they get lost, guides provide "kernels of knowledge" to help them on their journey. The object of the "game" is to navigate their way through the maze in the shortest amount of time. It is an interactive journey that doesn't involve a television.

Maze created by The Amazing Maze Company

Most farms provide more than mazes. They have gift stores featuring fresh baked goods and produce, garden centers, corporate team building events, and educational opportunities for school children. Cherry-Crest Farm even has Flashlight Maze nights for youth groups, complete with bonfire and wagon rides (http://www.cherrycrestfarm.com/).

Agri-tainment?
Agri-Tourism?
Farm Park?

Are farms going to be more "agri-tainment" than operational or is this a new way of introducing agriculture back into the lives of our children? More information may be viewed at: http://www.americanmaze.com/2004mazes.htm.

Bangladesh Response Continued

(BAU) to address issues of arsenic in agriculture. The overall project involves a combination of capacity building, education, risk assessment, and research. Capacity building efforts have included the establishment of arsenic analytical capability, that had not existed prior to this project, at the four participating national partner institutions. Research involves both fundamental research (aimed at understanding arsenic dynamics in the soils of Bangladesh and similar systems in the U.S. and worldwide) and applied research aimed at developing agricultural and water management systems to minimize arsenic hazard. The emphasis is with flooded rice production, which is at the heart of Bangladesh life, economy, and culture. Recently, an innovative collaborative distance learning program was initiated involving the Soil & Crop Sciences Department and the Office of Distance Learning at Texas A&M University and Bangabandu Sheik Madjipur Rahman Agricultural University (BSMRAU) in Bangladesh, to strengthen education on arsenic issues among three target groups: graduate students, undergraduate students, and government and NGO agricultural professionals.

The need and the challenges are great, but the opportunities are even greater.

For more information, you may contact Dr.Bhajan Biswas or Dr. Richard Loeppert.

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Meet Lee Tarpley from Beaumont

A career dedicated to crop improvement, including both improved production practices and varietal improvement, with an emphasis on agronomic and industrial crops. Teaching and research interests both lie in improved understanding of the principles of crop improvement. Most of our crops are grown as large populations of plants exposed to multiple changes in the environment, so the improvement of yield and sustainability of production require fundamental understanding of how individual plants and groups of plants interact with the environment throughout development.

Lee Tarpley, Assistant Professor of Whole Plant Physiology

A current emphasis is to study the chemical processes relevant to functioning of the whole plant and its response to temperature. Crops are, or will be, subjected to unusual temperatures when we try to stretch the growing season, stretch the growing region, or upon global warming. Cool and warm temperatures that exceed certain stress-thresholds, as well as extended periods of cool or warm temperatures, alter yield, product quality and potential plant growth. The unusual temperatures influence physiological processes, such as the fixation of carbon and nitrogen into compounds (photosynthesis), respiration for energy and cell maintenance, temporary storage of carbon- and nitrogen-containing compounds, development of reproductive and vegetative structures, and differential development of plant structures. An adequate solution to avoid, alleviate or remediate a temperature- or other environmental factor-related decrease in economic yield could involve breeding for increased tolerance or manipulating crop management to avoid the stress, but also could potentially be something like a novel agrochemical treatment to alter a specific chemical process in the plant or use of a plant growth regulator treatment to influence development of the plant structure. Research will continue on other environmental factors, including plant nutrition and oxidative stress.

The study of plant response to temperature or other environmental factors entails a number of approaches, which are driven by the problem situation. These include the need for prediction or early detection of stress, which might involve non-invasive rapid approaches such as remote sensing with GIS or rapid in-the-field diagnostics. A more thorough understanding of plant physiological response to environment entails the development and use of efficient methods of study, including dedicated control and measurement of environmental factors under reasonably natural conditions, the development and use of information-rich biochemical analyses of many plant samples, careful examination of a particular physiological process from a number of angles, and development and use of new data analysis procedures as needed. Methods development, optimization and validation are major aspects of research and will be continued. With these efficient methods in place, the evolutionary physiology of some crops can be studied and the knowledge gained used to indicate new functionalities accessible through manipulation of combinations of physiological traits.

Find out more about Lee at beaumont.tamu.edu

The course, Molecular and Physiological Bases of Crop Improvement" has a potentially large national and international appeal and will be offered through web-based technologies to access the clientele. "Journal Club" offerings on aspects of crop physiology will continue to be offered through a web-based platform to reach graduate students and others interested in continuing education spread across Texas. Other course offerings will either be in aspects of plant physiology and biochemistry or in methods of crop physiology. The training of graduate students who are independent, critical-thinking citizens of the scientific and academic communities will be emphasized.

Born to a military officer/English professor and civil service-librarian/home-maker/active volunteer, Lee Tarpley mainly grew up in San Antonio, Texas before slowly focusing in on a career in plant biology (Bachelor's in Botany, University of Wyoming; M.S. in Agriculture [Plant Science], Fresno State; Ph.D. in Plant Physiology, Texas A&M). He met his wife, Ming, in California, and they've been maintaining their dual-researcher household since then, with stints in College Station; Starkville, Mississippi; and now Beaumont, Texas.

When Lee is not working, he spends his time sharing the chores around the house and chauffeuring the kids (Will, 12, and Lara, 7). His favorite activities include playing with the kids, soccer and reading.

new website: soilsustainslife.tamu.edu

Borlaug Lifetime Achievement Award

The Norman E. Borlaug Lifetime Achievement Award has been named for the only active faculty member at Texas A&M University who is a Nobel Laureate. This award, recommended by the Faculty Senate Executive Committee and approved by President Robert M. Gates, is to mark the recognition by the Texas A&M University faculty of Dr. Borlaug's lifetime of exceptional academic and scholarly accomplishments that bring honor and recognition to the University.

The recipient must have demonstrated a personal commitment to integrate science disciplines in his or her life's work; must have demonstrated a personal commitment to teaching and training young scientists; and must be addressing issues and areas of science with a clear positive impact on the human condition in a global setting.

Dr. Norman Borlaug

Astronauts Like Sandwiches With Tortillas

Ralph Waniska, TAMU food scientist, is developing ways to keep unrefrigerated flour tortillas fresh and tasty for more than a month. By changing the structure during baking, Waniska believes he can greatly improve on the roughly two-week shelf life of the typical flour tortilla. He hopes his processes will improve consumer satisfaction while reducing manufacturing and distribution costs.

However, Ralph does say, "the best tortilla is a fresh tortilla." He simply contends his techniques can make them more broadly available and last longer, even as he acknowledges that Mexican food aficionados used to eating tortillas within a couple days of baking aren't likely to embrace the changes.

His techniques, which A&M developed over the past three years and is attempting to patent and license, are unrelated to the chemical preservatives already used to curb microbial growth and prevent tortillas from spoiling.

Instead, they're designed to alter the structure of tortillas to make them less susceptible to turning stale. Two of the techniques - a dough conditioner and a new formula for the leavening agent, or baking soda - produce slightly thinner tortillas with smaller air bubbles. Air bubbles refract light, giving flour tortillas their appealing white color. But they also increase thickness, Waniska said, making tortillas less stable and thus prone to going stale faster.

A third technique involves the novel application of a common enzyme used to produce high fructose corn syrup. Waniska has found that the enzyme makes proteins in tortilla dough function more effectively, helping the structure hold up longer.

Waniska contends any of his techniques alone can make fresh flour tortillas last up to 40 days, and he's still studying the effects of combining the techniques.

He's collaborating with scientists from Iowa State University to produce flour tortillas that can last four years without refrigeration, while retaining fresh-like "rollability" and taste.

The ongoing research has piqued the interest of the National Aeronautics and Space Administration, which would like to pack longer-lasting tortillas for lengthy voyages, such as a manned trip to Mars. NASA has been sending flour tortillas into space since the first days of the Space Shuttle in the early 1980s, primarily because they produce few crumbs to float around in zero-gravity and get sucked into ventilators and other systems.

> Fresh flour tortillas last up to 40 days ?

The astronauts like them, too. "One of the favorite things they do is make (peanut butter and jelly) sandwiches with tortillas," said NASA spokesman Kelly Humphries. Ralph, who grew up on a Nebraska farm, believes the various techniques he's already developed would add a penny, at most, to the cost of producing about a dozen flour tortillas. In addition, he said the cost could be offset by a decrease in other ingredients, such as leavening agents. It now costs about 35 cents per dozen to produce standard flour tortillas, according to industry observers.

Sliding through Earth's shadow, the Moon turned haunting shades of red and orange during October 27th's widely viewed total lunar eclipse. The reddish hues are caused by sunlight scattered and refracted by the atmosphere into the Earth's otherwise dark central shadow region. Enjoying the show from Dunkirk, Md., astronomer Fred Espenak, recorded the images used in this composite photo. The picture shows the Moon at the beginning (right), middle (center) and end (left) of totality, which lasted about 81 minutes.

Credit and Copyright: Fred Espenak
http://search.nasa.gov/

An Aggie's Story

Daniel Dewey, Graduating Ph.D. Student, 2005

During the summer of 2001 my wife, Lindsey, and I were deciding where we should go to pursue a PhD degree. I asked my major professor at Utah State University where he would go if he were in my shoes. His response was Texas A&M University to work with Richard White. So I contacted Dr. White and we set up a lunch appointment at the American Society of Agronomy meetings that November. After talking with Dr. White over burgers and discussing things with my wife, Lindsey and I felt that College Station was the right place for us to be. I would be able to study the effects of drought on turf, which is my keenest research interest, and the excellent health benefits and competitive assistantship/fellowship stipend would make it possible for Lindsey to be a stay-at-home mother.

(l-r) Lindsey, Wyatt, Kai,Daniel, & McCall

"My family's sacrifices are my incentive to work and succeed in school"

My interest in turf started when I was completing my undergraduate degree at Utah State University. I could see that water conservation was going to become increasingly important in the Southwestern United States as populations grew. As conventional landscapes use a lot of water, and turf is a major component of landscapes, I felt that I had the best chances of really improving water conservation through studying the effects of drought on turf. With that in mind, I decided to study grass/wildflower mixtures that required no irrigation and no fertilization for my Masters Degree with the end goal being to produce a low maintenance, drought tolerant, aesthetically appealing mixture that could be used in low traffic areas. For my PhD, I was really interested in the variability in drought tolerance of zoysiagrasses that Dr. White had talked about while we were at the ASA meetings. I decided that I wanted to study some of the physiological and genetic responses of drought tolerant and susceptible varieties to drought.

The Potts Fellowship has provided the means for me to accomplish my career goals of completing a PhD and teaching at a university. The Potts Fellowship has also provided the means for Lindsey to be able to stay at home with our three children. We feel this will provide our children the best environment for becoming contributing, successful members of society. So, the Potts Fellowship is helping me and future generations to be successful.

As I will be teaching at Brigham Young University-Idaho, which is focused on getting graduates into the workforce with hands on experience as well as a degree, I will be able to have a direct and lasting impact on the turf industry by training the future leaders of that industry. I will also be able to more fully focus on "producing" the best graduates because all of my time will be dedicated to teaching/mentoring students. To produce the most capable graduates possible, I will be in close contact with individuals in the turf industry so that I can more closely monitor their needs. Knowing industry needs will help me to expose students to the right environments to give them the skills necessary to best address industry needs once they are out in the "real world."

My family's sacrifices are my incentive to work and succeed in school. It is difficult to see college friends getting "real jobs" with incomes, while your husband drags you and your kids 1500 miles away from family and friends to be poor for three more years with no guarantees of getting any closer to family when you're finished with school. It is also difficult for children to get to know their grandparents, uncles, aunts, and cousins through pictures. However, with sacrifice comes blessings and we've grown closer as a family and further solidified the sentiment that we can make it on our own without putting our family on hold. We have also made life-long friends while we've been in College Station and had experiences that we would not trade for anything.

R.C.Potts

The R. C. Potts Turfgrass Graduate Fellowship was established in honor of Dr. Richard C. Potts by the Texas Turfgrass Association. Dr. Potts was born in 1912 on a farm in Oklahoma. In 1937, he came to TAMU and received a M.S. degree in 1945 and in 1950, he obtained a Ph.D. from Nebraska. He then rose through the ranks to professor, as a teacher and researcher of forages and turf. Dr. Potts later served as Assistant then Associate Dean for Resident Instruction in the College of Agriculture at Texas A&M for over 20 years.

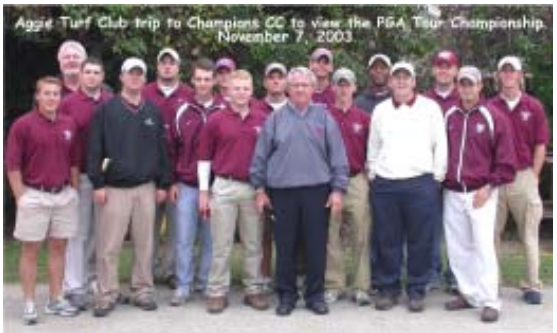
STUDENT CLUB ACTIVITIES

TURFGRASS Club

The Texas A&M University Turf Club reformed in the 2003-2004 academic year after a few years of being dormant. Dr. David Chalmers serves as their Faculty Advisor. Last year was a busy but productive year. The club major activities involved:

- Monthly club meetings with four outside guest speakers from industry.
- Organizing a trip to the PGA Tour Championship that allowed 17 members to witness tournament preparations first hand, courtesy of Charles Joachim, CGCS, Champions Golf Club.
- Organizing a Turf Program Booth to represent TAMU at state and national conferences.
- Attending the Texas Turfgrass Association Conference in San Antonio.
- Sending a team to represent TAMU at the GCSAA Quiz Bowl in San Diego.
- Creating ties and interaction with TAMU Turf Program former students, industry and associations.

In the 2004-05 academic year, the club will again attend the above events and bring in outside speakers to club meetings. There may be opportunity to help send a student or two to the Sports Turf Managers Association Conference in Phoenix. Recently, the Club tried to start up the "Dollars for Scholars" Legacy Golf Tournament (planned for November) but had to cancel due to lack of participation. This was intended to be the Turf Club's main fundraising event for the purpose of sending club members to participate in state and national conferences representing Texas A&M University, the department, and the club. Those wishing to support the club activities, by making a tax-deductible donation, should make their check out to the Texas A&M Foundation and include the account number 958240-00000 on the check. Donations should be sent to the Department of Soil and Crop Sciences, ATTN: Instruction Office, Texas A&M University, 2474 TAMU, College Station, Texas 77843-2474.



AGRONOMY Club

What was that? You want one of those new long-sleeve "Leaders in Agriculture" shirts? Me too. If I don't get them all first, you can still pick one up in room 217 (Heep). You might even find a matching cap.

The national students in Agronomy, Soils, and Environmental Sciences (SASES) has a new president. Guess who? That's right, the Agronomy Society's current secretary, Crystal Machacek! Congratulations! We were well represented this year at the national meetings, held in Seattle, WA the end of October. Joel Wilkinson won First Place in the Undergraduate Visual Presentation Contest, for the second year in a row. He presented his project titled "Thousands of Acres of Spuds" at the Awards Banquet at the end of the conference. Let's not forget Amber Whiteaker, who was a very strong competitor in the Speech contest. The Quiz Bowl Team also showed off some Aggie agricultural expertise. The team consisted of Heather Jahnsen, Coy Nall, Amber Whiteaker, and Joel Wilkinson. Our very own Shane Melcher ran the contest.

The Agronomy Society

Don't forget to mark down April 15-17 on your calendar for the Southern Regional SASES. We will be hosting this annual event for the first time. Approximately 12 schools are expected to participate in the 3-day event, which will include lectures, tours, social events, and contests. This will be a great opportunity to meet students and professors from other schools.

Don't forget Parent's weekend, April 8-10, 2005. For more information email Joel at jwilk@tamu.edu. Gig 'em!

The Texas A&M Agronomy Society.

Congratulations David Zuberer, who was recently named Fellow by the American Association for the Advancement of Science.

Meet David Chalmers from College Station

David Chalmers, Associate Professor and State Extension Turfgrass Specialist

David Chalmers is a native of southeastern Michigan, just outside of Detroit. One of two children, David's father worked as an automotive engineer for the Fisher Body Division of General Motors and his mother was a homemaker. He first attended college at Wayne State University, in Detroit, on a basketball and golf scholarship. It was his love of golf that convinced him to transfer to Michigan State University to graduate in the Crop Science Department's Turfgrass Option. This was a concept that was a bit foreign to his very supportive father, who he can recall saying, "What are you going to do, cut grass the rest of your life?" Having first thought of a career as a golf course superintendent, he realized he enjoyed the scientific cause and effect relationships associated with turf management and decided to pursue graduate study (M.S. in Agronomy, Virginia Polytechnic Institute and State University; Ph.D. in Horticulture, University of Illinois). David was the state Turfgrass Extension Specialist at Virginia Tech from 1981 to 2002. During that time he also taught and advised undergraduate students in the two and four-year turfgrass programs and working with graduate students. He met his wife, Eluned, at Virginia Tech. David and Eluned joined the Texas A&M University System in 2002. Eluned is on faculty in Agricultural Economics and is the Director of the Texas A&M University Master of Agribusiness Program.

"What are you going to do, cut grass the rest of your life?"

When David is not working, he has been known to spend a bit of time on the golf course. Other favorite activities include cooking, reading and traveling.

As the State Extension Turfgrass Specialist, his primary objective is to increase the use and understanding of agronomic information related to turfgrass production by all segments of the Texas turfgrass industry. The industry was valued in 1994 at over six billion dollars and comprises a diverse clientele whose livelihood depends on managing grasses to enhance the aesthetics of the environment, and provide for safe and usable outdoor recreation by use of best management practices. It not only includes turf culture but also the commerce generated by producing quality turf. The clientele represents a broad range of educational background and practical experience, from the uninformed home consumer to the college-trained professional. Included in this diverse group are growers (sod farmers, golf course superintendents, grounds managers, and home consumers), service related individuals and companies (professional lawn services, Extension agents, consulting agronomists, horticulturists, manufacturers and suppliers) and governmental agencies (water authorities, regulatory agencies and city governments).

The Soil and Crop Science Turf Extension program is a joint effort involving Dr. Chalmers, Dr. Jim McAfee (Turfgrass Extension Specialist - Dallas) and Roger Havlak (Extension Program Specialist – San Antonio). It is structured to handle the need for immediate problem solving information, encourage and support the turfgrass professional's involvement in continuing education and educationally oriented associations, and to provide formal training opportunities. This is accomplished by being actively involved in turfgrass-related professional associations, extension agent programs, research field days, and the annual Texas Turfgrass Association conference. By being so involved, the program is able to provide assistance and guidance to the turfgrass industry as well as sense the need for new educational programs. Other equally important components of the turf extension program include continuing education short courses, publications, test demonstration research, mass media releases and individual consultation.

David's recent research activity has been in the areas of turfgrass variety evaluation, bermudagrass spring transition from perennial ryegrass winter overseeding, and nutrient management in turfgrass systems. Recent extension activity has involved developing a Statewide Master Gardener turf curriculum presented in a "Turf For Texans" Master Gardener CD. He has also been active in providing meaningful leadership as technical advisor to industry groups, specifically the Turfgrass Producers of Texas and the Texas Turfgrass Association. He has chaired efforts by the entire TAMU Turfgrass Program faculty in strategic planning. He also directs a five-day Turfgrass Ecology and Management Short Course scheduled for late January 2005 (http://cecoe.tamu.edu/turfgrass/index.htm).

Paper Or Plastic?

U.S. Environmental Protection Agency

Did you know plastic grocery bags consume 40% less energy to produce and generate 80% less solid waste than paper bags? Did you know plastic bags can take 5-10 years to decompose whereas paper bags take about a month to decompose? The debate over whether plastic or paper bags are better for the environment has a long history and is often rekindled each time we check out at the grocery store when we hear that familiar question: Paper or plastic?

There seem to be pluses and minuses on both sides of the debate. For paper bags, the life cycle stages consist of timber harvesting, pulping, paper and bag making, product use and waste disposal. For plastic (polyethylene) bags, the steps involve petroleum or natural gas extraction, ethylene manufacture, ethylene polymerization, bag processing, product use and waste disposal. In all of these steps, energy is required and wastes are generated.

Some more facts about these two products may help us to answer this age-old question:

Plastic bags were first introduced in 1977 and now account for four out of every five bags handed out at grocery stores.

Paper sacks generate 70 percent more air and 50 times more water pollutants than plastic bags.They are made from trees, which are a renewable resource. Most plastic bags are made from polyethylene, which is made from crude oil and natural gas, nonrenewable resources.2000 plastic bags weigh 30 pounds, 2000 paper bags weigh 280 pounds. The latter takes up a lot more landfill space.

It takes 91 percent less energy to recycle a pound of plastic than it takes to recycle a pound of paper. It takes more than four times as much energy to manufacture a paper bag as it does to manufacture a plastic bag. Energy to produce the bags (in British thermal units): Safeway plastic bags: 594 BTU; Safeway paper bags: 2511 BTU.

Paper is accepted in most recycling programs while the recycling rate for plastic bags is very low. Research from 2000 shows 20 percent of paper bags were recycled, while one percent of plastic bags were recycled. Current research demonstrates that paper in today's landfills does not degrade or break down at a substantially faster rate than plastic does. In fact, nothing completely degrades in modern landfills due to the lack of water, light, oxygen, and other important elements that are necessary for the degradation process to be completed.

What do you prefer when you check out at the grocery store?

Incineration can decrease the quantity of plastic and paper bags. However, incineration causes air pollution and creates ash which has to be landfilled.

So, what is the answer, paper or plastic? NEITHER! Look into purchasing reusable bags or reusing your paper or plastic bags at the store. Reusing a bag meant for just one use has a big impact. A sturdy, reusable bag needs only be used 11 times to have a lower environmental impact than using 11 disposable plastic bags.

In New York City alone, one less grocery bag per person per year would reduce waste by five million pounds and save $250,000 in disposal costs. When one ton of paper bags is reused or recycled, three cubic meters of landfill space is saved and 13 - 17 trees are spared! In 1997, 955,000 tons of paper bags were used in the United States. When one ton of plastic bags is reused or recycled, the energy equivalent of 11 barrels of oil are saved. Many grocery stores now offer for sale sturdy cloth grocery bags. Some of these stores even give you a little discount (e.g., five cents per bag) if you bring your own bag. So, keep a stash of reusable bags in your pantry or if you drive to the store simply keep them in your trunk.

Turfgrass Team Participates In Retreat to Better Serve Texas Turfgrass Industry

David Chalmers

Members of the Texas A&M University Turfgrass program came together for a retreat in March 2004 at the Canyon of the Eagles Lodge on Lake Buchanan. The focus of the group was centered on new challenges and opportunities presented by a dynamic and growing turf industry (valued in 1994 to have a $6 billion annual impact on the Texas economy). The retreat brought together a core group of TAMU teaching, research and extension faculty to address issues that impact how such a multidisciplinary group of scientists and educators can work together to improve the turfgrass program for the betterment of the Texas turfgrass industry. Both industry and allied faculty were solicited for their input prior to the retreat. Discussions at the retreat evaluated the turfgrass program's strengths, weaknesses and opportunities and centered on how the TAMU System turfgrass program can best serve our Texas clientele. Toward that end, the "Team" goal is to be consistently viewed as one of the very best turfgrass programs in the country. The positive momentum taken away from the retreat and willingness of T3 faculty to focus on making the Texas A&M University System Turfgrass Program a "Center of Excellence", means good days are ahead for turf in Texas!

TCE specialists teamed with the Plains Cotton Growers and Cotton Incorporated to identify profitable new varieties.

Large Trials Improve Profits

Randy Boman

The High Plains of Texas is, by any measure, a harsh environment for cotton production, with risk from short growing seasons, drought and high temperatures causing cotton producers to have a very real uncertainty with respect to profits. In addition to the demanding climate, the continuing loss of domestic cotton mills is causing High Plains producers to struggle to make cotton production profitable. There is a great variability in the genetics of cotton varieties with respect to adaptation to these adverse conditions. A recent increase in the release of cotton varieties and genetically altered traits makes selection of cotton varieties by farmers a more difficult decision. Substantial gains in both yield and quality are required for sustainable cotton production.

Recognizing this scenario, TCE specialists teamed with the Plains Cotton Growers and Cotton Incorporated to identify more profitable, new transgenic and conventional varieties for High Plains producers through large-plot variety testing. Based on producer feedback to surveys obtained at High Plains crop conferences in 2004, it appears that the large-plot systems variety project is very useful to South Plains cotton farmers. According to the USDA Cotton Varieties Planted Reports for 2001, 2002, 2003, and 2004, significant variety changes in the High Plains can be documented. These changes parallel improved yields and cotton quality identified in large-plot cotton variety studies initiated by TCE specialists and their collaborators. Varieties and technologies with lower overall economic returns are quickly being replaced by improved types. One example is the rapid adoption of the FiberMax 958, a conventional variety, which has been identified by the Systems Variety Testing Project as a more profitable type. The 2003 total for planted acres of FiberMax 958 from the two classing offices (Lubbock and Lamesa) is about 586,000. Producer responses to surveys of the economic impact on large-scale variety trials varied from $35/acre to $160/acre. If we use an average of $50/acre in increased profits on South Plains cotton acres, this would translate to a $29.3 million increased returns to the region with the adoption of just this one variety. We are obtaining additional gin-specific data from several producers across the region to better identify the value of the project. It is expected that continuing increases in "new variety" acreage will have a major impact on both profitability and quality/ marketability of High Plains cotton over the next few years.

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