20 YEARS OF PLANT BIOLOGY

Plus: The Seeds of Progress  __ Special Postdoc Section  __ A Legacy of Success
For more than two decades, the Noble Foundation’s Plant Biology Division has performed the highest quality basic biochemical, genetic and genomic plant research for the purpose of improving characteristics within crops, such as disease resistance, drought tolerance and forage quality.

Inside is a look back at the people, the events and the vision that established one of the premier plant research institutions in the world.
The Real Answer

“What does the Noble Foundation do?”

It is a question I’m asked daily as president of the Noble Foundation. It’s an understandable query, of course. The Noble Foundation is unlike most private foundations, which exist solely to distribute grants.

We do provide more than $12 million in grants to charitable organizations each year, but our focus remains dedicated to developing one of the most comprehensive agricultural and plant science research institutions in the world with the sole purpose of benefiting farmers, ranchers and mankind.

Our unique mission was set forth by Lloyd Noble, who established this organization in 1945 as a way to help solve one of our region’s most pressing problems. Poor farming practices and drought devastated the Oklahoma landscape in the early to mid-1930s, and he decided a charitable foundation could be a touchstone of change.

The Noble Foundation began with a “soils” group, which tested a farmer or rancher’s soil and told them what nutrients needed to be returned to the land to keep it viable. It was an invaluable service and laid the groundwork for our efforts which continue more than six decades later.

The soils group is now the Agricultural Division, and the services they provide stretch far beyond soil testing. Today they provide consultation to more than 1,600 farmers and ranchers, helping them achieve their financial, production, stewardship and quality-of-life goals.

Four teams of consultants – each containing a specialist in wildlife, soils, pasture and range, livestock and economics (and when required, horticulture) – assess each producer’s needs and tailor recommendations to fit his/her unique circumstances. This service is offered at no cost to the producers.

To further its mission, the Noble Foundation expanded into fundamental plant science research (Plant Biology Division) and forage breeding and translational plant science (Forage Improvement Division) during the past 20 years. Along with the Agricultural Division’s research group, these scientists and researchers provide invaluable insight into forage crops, such as grasses and legumes, as well as develop new varieties for use by producers. These groups have already established themselves as international leaders in their fields.

While “agricultural programs and scientific research” are the easy response to what the Noble Foundation “does,” I really learned about what we do at a local high school football game some 15 years ago.

On a perfect fall evening, the Ardmore Tigers were facing their weekly gridiron foe, and I found myself waiting in line at the concession stand when a farmer approached me with a blustery greeting: “Cawley!” I heard as a barrel-chested man stepped forward.

His overalls were worn and his John Deere ball cap was faded from countless days working under the Oklahoma sun. He reached out, shook my hand, and asked: “You work out at the Noble Foundation, don’t you?” I said, “Yes, sir, I do.”

As we talked, he explained that he was one of the many farmers and ranchers who received consultation services from our Agricultural Division, and how our consultants had turned his struggling operation into a successful endeavor and then he said, “I just wanted you to know if it wasn’t for the Noble Foundation, I would not have been able to put my children through college.”

An appreciative tear welled in his eyes. He patted me on the shoulder and with that, he turned and walked away.

I had been president for almost two years and I could talk with great authority about this organization, but it wasn’t until that moment that I really understood what the Noble Foundation “does.”

We change lives. We open doors. We explore new worlds. We ask questions. We find answers. We help.

That is what we do. That is the real answer.

Sincerely,

Michael A. Cawley
President and Chief Executive Officer

Your Health

Grape expectations

Alzheimer’s disease affects more than 24 million people worldwide. Richard Dixon’s mother was one of them.

Dixon, D.Phl., serves as Senior Vice President and Director of the Plant Biology Division at The Samuel Roberts Noble Foundation, and he’s watched firsthand the debilitating effects of Alzheimer’s, a disease that claimed his mother’s independence, erased a lifetime of memories and eventually ended her life.

“It was an extraordinarily difficult time,” Dixon said. “Within a matter of a few years, she went from being totally independent – able to successfully navigate international travel – to a woman who was unable to find her way around the town she had lived in for decades.”

More than five years removed from his mother’s death, Dixon was asked to collaborate on a National Center for Complementary and Alternative Medicine (NCCAM) project at Mount Sinai Medical Center in New York to investigate if chemical compounds from grape seed extract could provide protection against a disease which has been deemed “the long goodbye.”

Mount Sinai researcher Dr. Giulio Pasinetti, conceptualized a consortium to study the effects of various plant components (“botanicals”) as protective agents against the onset and development of Alzheimer’s dementia. A particular class of polyphenol, called condensed tannins, is thought to be a likely candidate for the anti-Alzheimer’s effect.

Dixon is internationally renowned for his research on condensed tannins. Recently, he received a three-year, $320,000 grant from the National Institutes of Health (NIH) as part of his efforts with the consortium, which also includes scientists from Purdue University, Rutgers University and the University of California at Los Angeles (UCLA).

As part of the NCCAM consortium, Dixon’s laboratory works to fractionate grape seed extract, which is a complex mixture of many different chemicals, several of which are polyphenols.

Researchers look for the specific compound or group of compounds responsible for imparting human health benefits. Initial findings are already being reported back to Mount Sinai’s research group, who then follow up with detailed analyses of the effects of the isolated compounds on brain proteins in the test tube and on cognitive function in animal models.

“This is a long-term process that requires us to answer many questions,” Dixon said. “You must identify what chemical compounds are at play within the grape seed extract and then understand how the chemical compounds impact the body. You must see if the chemicals make it to the brain or if they cause a secondary chemical reaction within the brain.”

Your Health
body that has the beneficial effect. We hope eventually that our research leads to the development of a plant-derived agent that protects against Alzheimer’s.

Dixon’s experience in this field comes from his research at the Noble Foundation and his efforts to understand and utilize the biosynthesis of condensed tannins to reduce the incidence of pasture bloat in ruminant animals, such as cattle. The ultimate goal is to develop bloom-safe alfalfa – alfalfa does not naturally produce condensed tannins in its leaves or stem. As with his work with the Mount Sinai consortium, his research also holds the potential to advance human health discoveries.

“The plant science research at the Noble Foundation is focused on benefiting agriculture,” Dixon said. “However, as with many of our research projects, there are applications for humans. For many years, I had been considering how our work could move beyond agriculture to exploit the potential of tannins and related compounds for prevention of diseases such as cancer. The work with polyphenols in grape seed extract is a good example of how plant science can be applied to make inroads for human health breakthroughs.”

**Awards**

The Noble Foundation presented Micheal and Julie Campsey with the 2008 Leonard Wyatt Memorial Outstanding Cooperator Award during a special presentation at Noble’s Southern Plains Beef Symposium in August. The Leonard Wyatt Memorial Outstanding Cooperator Award is given annually to one of the more than 1,600 farmers and ranchers who work with the Noble Foundation’s Agricultural Division. As part of its mission, the division provides agricultural producers – called cooperators – with consultation services and educational programs in an effort to help them achieve their financial, production, stewardship and quality-of-life goals.

In 1993, the Campseys began their ranching venture when they moved to a ranch near Jacksboro, Texas, owned by Micheal’s father. Even though they possessed little agricultural experience, they were thrust into managing the operation a few years after Micheal’s father retired. Their local veterinarian told them about the Noble Foundation and their consultation services.

“We contacted the Noble Foundation, and our program has never been the same,” Micheal Campsey said.

**Research**

Noble Foundation researchers and agronomists are studying the possibility of using legumes to offset the need for costly fertilizers. The research could provide a financial savings to farmers and ranchers.

Nitrogen, only 25¢ per pound, is now $6.50 per pound (or more), an increase of more than 150 percent in the last few years. As these prices increase, the Noble Foundation is taking a second look at winter and summer legumes, such as alfalfa, clovers, medics, vetch and other similar crops, and their innate ability to fix nitrogen in the air. Their root system, accommodating bacteria called “rhizobia,” converts atmospheric nitrogen to ammonia creating a source of fertilizer that could help stem production costs.

“We’ve hit a critical period in agriculture,” said James Rogers, Ph.D., pasture and range consultant and team manager. “The way we used fertilizers is gone and may be forever. It’s vital we discover alternatives to the issue of fertilization, and legumes look to be a positive alternative.”

Noble Foundation agronomists with the Forage Improvement and Agricultural divisions, Tuan Butler, Ph.D., and John Gurzetsky, Ph.D., are conducting several field trials, one of which is a legume-bermudagrass grazing trial on 42 acres. The trial’s objective is to discover how legumes impact bermudagrass that is being grazed.

“More than 2.5 million head of cattle are within a 100-mile radius of the Noble Foundation,” Gurzetsky said. “Cattle are the predominant agricultural business in the region, so it’s important that we find how legumes and grasses can work together to better support the cattle industry.”

While legumes are a positive alternative to high fertilizer costs, they do not freely give their nitrogen production away. The primary source of nitrogen transfer comes from decomposition of dead legume plant material to the following grass crop or by recycling urine and dung via grazing to the companion crop.

“To make a legume-grass system work, management must be focused on the legume,” Rogers said. “Pastures will look different than they have. It will look uneven and may have more weeds, but that’s OK.”

Because legumes are less persistent than grasses, pastures comprised of grasses and legumes require a higher degree of management than nitrogen-fertilized pastures. Legume-grass systems also complement the growth of grasses and extend the production of forage into spring growth periods when food has been harvested from grasses in the southern Plains.

**Bettinger our community**

Robert Wells opened the box and peered inside to see almost 200 phone cards neatly stacked and sealed in cellophane.

“Wow,” said Wells, Ph.D., smiling. “I can’t believe how fast this all happened. We just started this program a few months ago, and now we’re already sending cards overseas. I couldn’t be more excited.”

Wells, a livestock consultant with the Noble Foundation Agricultural Division, facilitated the Noble Foundation’s effort to become an official drop-off point for Cell Phones for Soldiers, a nonprofit organization which recycles donated cell phones and uses the proceeds to purchase calling cards. Each donated cell phone equates to an hour of international talk time for American soldiers serving in Iraq and Afghanistan.

“There has been an amazing outpouring of support,” Wells said. “We’ll send this group of cards over, and our collection box is almost full again, so we’ll be able to send more.”

Communication between soldiers in Iraq and their families is difficult. While some soldiers attempt to call home using cell phones – resulting in astronomical phone bills – others try to use the sporadic litter service, the best way for troops to contact home is through land lines with international calling cards.

Wells knows firsthand the importance of communicating with a loved one overseas. Wells’ wife, Danielle, currently serves in Iraq with the 1120th Ordinance Company out of Ada, an attachment of the 45th Infantry Combat Division.

This summer, Danielle Wells received 15 days of leave, so she returned to Oklahoma. During her 20-hour return trip to the Middle East, Wells’ group stopped in Europe for refueling. She placed a quick call to her husband. Their 1-minute conversation cost the couple almost $75.

“It was worth every penny to know she had made it that far safely. I would have paid anything,” Robert Wells said. “But transcontinental communication comes at a high price for those in the military. Each of these calling cards is a lifeline between the soldiers and their families.”

For individuals who want to donate a used cell phone, the Noble Foundation drop box is located in the Agricultural Division’s lobby. All cell phones – functioning or not – may be donated with or without batteries. The charger may be donated as well.

**Notables**

Robert Wells
The Seeds of Progress

Oklahoma Bioenergy Center plants world’s largest site of switchgrass

This summer, Noble Foundation researchers and agricultural specialists planted 1,000 acres of switchgrass near Guymon in the Oklahoma Panhandle on behalf of the Oklahoma Bioenergy Center (OBC). These production-scale demonstration fields are the world’s largest site of switchgrass devoted to cellulosic ethanol production.

“Raising food costs recently resulted in a pushback against renewable fuels. However, cellulosic ethanol from sources such as switchgrass is noncompetitive with food sources for animals and humans, and remove cellulosic ethanol from this discussion,” said Oklahoma Secretary of Energy David Fleischaker. “More importantly, this dedicated land will allow us to demonstrate the advantages of switchgrass.”

Switchgrass is a different type of energy crop. It has a higher relative energy output than corn and does not compete with human or animal food sources. It is a perennial grass that is naturally drought resistant and grows on marginal cropland. The OBC demonstration fields will provide academia and industry a unique “living laboratory” to understand the production and long-term impact of bioenergy crops, as well as experiment with new production techniques and critical harvest, collection and transport methods. The fields also will serve as a “living classroom” where agricultural producers, policymakers and the general public can see and experience these crops which will play a key role in the United States’ energy future.

“These fields are vital for the continued development and understanding of dedicated energy crops,” said Michael A. Cawley, President and Chief Executive Officer of the Noble Foundation. “This is more than just a research project that ends in the field. It has a market endpoint.”

A cellulosic bioenergy currently being constructed by Abengoa Bioenergy in Hugoton, Kan., will be less than 35 miles from the Panhandle switchgrass fields. The parties are developing a contract to enable a future supply of the material to the bio refinery. The Abengoa Bioenergy facility is expected to be operational in 2010.

“The value of the Oklahoma Bioenergy Center to the cellulosic ethanol industry cannot be overstated,” said Gerson Santos-Leon, Executive Vice President, Abengoa Bioenergy New Technologies.

“The early and aggressive establishment of 1,000 acres of switchgrass will provide researchers, scientists, agricultural producers and industry – not only in Oklahoma, but across the nation – with important information that will help establish the emerging cellulosic ethanol industry.”

Revenues received from the sale of biomass will be reinvested in the OBC for additional bioenergy and biofuel research. The 1,000 acres of switchgrass leverages the extensive agricultural infrastructure and farming expertise located in Oklahoma’s Panhandle. This undertaking is made possible through a lease arrangement with Hitch Enterprises, Inc., one of the region’s most renowned agriculture operations. A family-owned and managed agricultural company, Hitch Enterprises has conducted extensive cattle feeding, cattle production, pork production and agricultural operations near Guymon for more than 110 years.

The participation of Hitch Enterprises enables the concentrated establishment of the 1,000 acres in one geographic location, which will enable critical research in the areas of harvest, collection and transportation that challenge the emerging biofuels industry.

Agricultural researchers for the Noble Foundation will manage the 1,000 acres as part of Noble’s OBC-related activities.

Who is in the OBC?

A state initiative championed by Gov. Brad Henry, the Oklahoma Bioenergy Center brings together Oklahoma’s comprehensive higher education institutions – the University of Oklahoma (OU) and Oklahoma State University (OSU) – with the world-class plant and agricultural research of The Samuel Roberts Noble Foundation to initiate a biofuels industry within the state.

Story: J. Adam Calaway Photograph: Broderick Stearns

Just a phone call away

Helpline provides farmers, ranchers with invaluable resource

In the world of agriculture, landowners and producers have many questions. For instance, “What is the best way to determine the carrying capacity of my pastures?”, “How do I lease land I’ve inherited?”, or even, “Are armadillos edible?”

For those who have agriculture-related questions, no matter how unique, the Noble Foundation’s Agricultural Division created the Ag Helpline.

The Helpline is a free call-in service offered through the Agricultural Division to give assistance to anyone, even those landowners and producers outside of the local region. The Helpline gives callers access to the division’s consultants, who specialize in each of the primary facets of agriculture – from established cattlemen to wild-
Launching Scientific Careers

Just after a 3-inch rain, Francis Kirigwi, Ph.D., a postdoctoral fellow in the Forage Improvement Division of The Samuel Roberts Noble Foundation, visited the plot where he assesses the performance of potential new fescue varieties bred to exhibit tolerance during drought conditions. Unfortunately, the recent spring deluge could adversely affect his research results, but Kirigwi shrugged and noted, “It’s not good for me, but it’s good for the farmers.”

Perhaps Kirigwi remains connected to local farmers because he is a farmer in Kenya, as is his family. Yet his philosophy is not unique; it is the original mission of Lloyd Noble, who established the Noble Foundation in 1945 to assist agricultural producers. It is a belief echoed by Rick Nelson, Ph.D., professor and principal investigator in the Plant Biology Division: “My goal is to help humankind; this is always in the back of my mind.”

To reach this ultimate goal, the Noble Foundation provides an unprecedented research culture for postdoctoral fellows, otherwise known as “postdocs,” recognizing them as indispensable gears in the complex machinery of modern research. “Without postdocs,” Nelson comments, “science would grind to a halt.”

Phillip Harries, Ph.D., a postdoc in Dr. Nelson’s laboratory, adds “I appreciate that I am valued by both my principal investigator and the Foundation. That’s why I chose to come to the Noble Foundation. My relationship with my mentors here determines my future as a scientist.”

After earning a Ph.D., postdocs become a part of research laboratories at the Noble Foundation where senior scientists – known as “principal investigators” or “PIs” – provide guidance. Comparable to the medical doctor’s residency, postdocs need further training in a laboratory setting conducting additional research. During a traditional postdoctoral fellowship, postdocs do not take classes or teach – the status quo while a graduate student – which allows them to concentrate on research for a three- to four-year paid term.

But the Noble Foundation goes further.
No hassle research
Noble postdocs – perhaps more than their colleagues at other institutions – can dig deep for research results with little angst over future funding because the Noble Foundation’s endowment provides stable backing for projects.

At other institutions, much time could be spent preparing no-guarantee grants to keep a project alive and to fund salaries. “Grant writing for external funding remains part of our postdocs’ lives, but the Noble Foundation does what it takes to conduct good science. On average, I might spend 25 percent of my time on proposals and management of grants. I think it would be much higher elsewhere.”

Though the Noble Foundation continues to receive more of its annual operating funds from federal and state agencies each year, its stable source of base funding provides freedom from the anxiety that one project will be cut so that another may continue. This environment contributes to a creative and nurturing culture as well as camaraderie among the scientists who take educated and creative risks. Because of the myriad of freedoms the Noble Foundation affords, postdocs can more quickly evolve from workers tied to the laboratory bench or knee-deep in red soil – though that will always be a part of their lives – to the mavericks of cutting-edge science.

Faster results lead to faster publication in the “publish or perish” world of scientists. Kirigwi explains the unique importance of publications to postdocs: “Because publications are the only record of our work, the Noble Foundation has an advantage over the field because we can concentrate on research results, not on waiting for grants.” These publications open other doors to national and international partnerships, colleagues and, best of all, future employers.

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Noble Foundation ranks in the Top 10 best places to work for postdocs

Internationally renowned for its plant science discoveries and agricultural programs, the Noble Roberta Noble Foundation added another distinction in March 2008. The Scientist magazine released its annual Best Places to Work for Postdoctoral Fellows (postdocs) survey, and the Noble Foundation was ranked No. 8. More than 80 institutions nationwide participated in the magazine’s sixth annual survey.

This year marks the first time the Noble Foundation participated in the magazine’s postdoc survey. The Noble Foundation also ranked as the highest plant science research institution on the list. “The Noble Foundation is widely regarded as a source of excellence in the scientific and agricultural communities,” said Michael A. Cawley, President and Chief Executive Officer of the Noble Foundation. “This is the result of a national survey reaffirm that the Noble Foundation is dedicated to performing world-class research and providing abundant opportunities for those who conduct that research. We have the best postdocs from around the world and, as an organization, we are committed to provide them the means to succeed during and after their time here.”

The Noble Foundation employs 57 postdocs from more than 20 different countries to conduct research in the Foundation’s world-class facilities in Ardmore, Okla. Postdocs are typically defined as nontenured scientists with a doctoral degree, many of who have recently graduated. Postdocs typically spend three years at a research institution after graduation.

Noble researchers and the Noble postdoc science program provide training and mentorship to help postdocs establish their careers and become independent scientific investigators or university faculty.

The Noble Foundation competes with countless national and international research organizations to recruit the best postdocs and retain them. “Noble researchers have an opportunity to learn and grow as scientists,” said Richard Dixon, Senior Vice President and Plant Biology Division Director. “This survey shows the Noble Foundation is among the very elite in providing an environment that helps launch these young scientists into their careers.”

The Scientist’s Web-based survey ran from Oct. 1 to Dec. 2, 2007, gathering almost 3,100 responses from postdocs at 82 research facilities in the United States. Participants were asked to rate their institutions on 44 criteria in 11 different areas. The Noble Foundation ranked as one of the highest paying institutions for postdocs and received its top scores for generous funding of postdoc research, the quality of the infrastructure; excellent internal communication with postdocs; and networking opportunities for postdocs.

There is no doubt the Noble Foundation has planted its flag as an international center for plant science research,” Dixon said. “Postdocs come from around the world to southern Oklahoma for an opportunity to learn and grow as scientists.”

This recognition shows we’re doing a very good job at preparing them for their lives as scientists.”

The Noble Foundation topped such recognized research organizations as the Mayo Clinic, the National Cancer Institute, the National Institute of Environmental Health Sciences, as well as dozens of universities, including the University of Texas Southwestern Medical Center and Duke University.

Francis Kirigwi, Ph.D. Postdoctoral Fellow

Rita Nelson, Ph.D., monitors young scientists in the laboratory.

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Noble Foundation's postdocs. Ranamalie Amarasinghe, Ph.D., requested a second computer monitor because her data spread across several screens. “At a university,” she said, “I would never have asked for a second screen. The Noble Foundation is more resourceful, and the tools here make the difference.” Amarasinghe completed two other postdoctoral fellowships at other institutions before arriving in southern Oklahoma, where she immediately recognized the prestige of her new scientific home and where she felt part of a team. She also chose the Noble Foundation because she “enjoys the freedom to attempt new research projects,” which would be difficult if she were at a university or working in industry. “We are privileged at the Noble Foundation to be able to try our own ideas with minimal limitations,” Amarasinghe said.

Of course, the research climate and resources are not the only consideration – even for new researchers. It is important to know that there is support from all groups, including administration and the governing board of an institution. In addition to assistance with navigating the sometimes confusing waters of work visas for international employees, the Human Resources Department provides new employees with guidance in getting settled in Ardmore and deciphering the inevitable challenges of any new community.

Human Resources also took an active role in 2008 to obtain additional benefits for Noble’s postdocs. While the Noble Foundation continues to provide competitive compensation to its employees, it was determined, in response to an internal survey, that the institution could improve its retirement benefits for postdocs. In prompt response, the Noble Foundation Board of Trustees implemented a retirement thrift plan to provide Noble postdocs an opportunity to save for their future. Most importantly, the cost of living in Ardmore allows many postdocs to buy their first home.

“The Noble Foundation has always been committed to providing compensation and benefits that equal – and oftentimes exceed – that of our peer institutions,” said Michael A. Cawley, President and Chief Executive Officer. “We are fortunate to have a Board that remains vigilant to continually improving the benefits offered to the employees.”

The means for success

The Noble Foundation provides the means for its people to succeed, and then some. Kirigwi, along with any other Noble Foundation postdoc who wishes, can plant a personal garden on the campus. Kirigwi grows sweet peppers, okra, capsicum and cow peas, a favorite from Kenya. The drought-resistant legume – prized in India and Africa – will survive the Oklahoma sun. Later Kirigwi will harvest the green leaves, fry or boil them, and serve them with beef or goat meat.

Those cow peas are a comforting reminder of a faraway home. The plant’s roots spread through the mountainous terrain. It’s Xie’s home, a place of peace and family.

Halfway around the globe is a town that would become as meaningful to Xie as that mountain village in China. In January 2001, Xie left China to become a postdoctoral fellow at The Samuel Roberts Noble Foundation. By August 2005, when he left the Noble Foundation, Ardmore, Okla., had become his second hometown.

The ABCs of Xie

Xie attended Hunan Jishou University and Hunan Normal University and earned a bachelor of science degree in biology. After completing his education, he moved to Beijing Normal University, where he obtained his master’s degree in cytogenetics, and then to the Institute of Botany, Chinese Academy of Sciences, where he earned his Ph.D. in plant physiology. His work progressed well, and in 2002 his wife, Guoli Liu, often brought his dinner to the laboratory and working late into the night. His work progressed well, and in 2002 he moved to Singapore on tropical cash tree biotechnology. His work progressed well, and in 2002 he moved to Singapore on tropical cash tree biotechnology.

“Condensed tannins had been studied for nearly a century, and their biosynthetic pathway had been investigated for nearly 50 years,” Xie said. “However, many questions remained unknown.”

The answers Xie searched for included the nature of the precursors of condensed tannins; the metabolic relationships between anthocyanin pigment and condensed tannins; the mechanisms whereby tannins are condensed into long chains; how the molecular shapes of tannins are controlled; and how tannins can be engineered into crops to improve forage quality.

Xie quickly became immersed in his research at the Noble Foundation, routinely working late into the night. His wife, Guoli Liu, often brought his dinner to the laboratory office. His work progressed well, and in 2002 he began to work on a project to characterize the activity of an enzyme encoded by the so-called BANYULS (BAN) gene. His research was successful, but he achieved unexpected results. He showed that BAN encodes a novel anthocyanidin reductase that made a chemical called epicatechin, a building block for the condensed tannins. When Dixon first saw...
Deyu Xie, Ph.D., works in his laboratory during his time as a postdoc at the Noble Foundation. My research accomplishments established my career in the U.S., and it was an honor to work for my mentors." He was close to many scientists and members of the Foundation staff.

"I was glad to work with laboratory manager Dr. Xianzhi He," Xie said. "He is one of the best friends in my life. He taught me how to drive. Dr. Fang Chen, one of the scientists in our laboratory, is also a close friend. I was lucky to work with such helpful laboratory technicians and other postdoctoral fellows. They are all like my brothers and sisters."

"On June 13, 2005, Xie and his wife were blessed with the birth of their first child. "I created his English name that is (a blending) of Noble Foundation, Ardmore and Oklahoma," Xie said. "My son's name is Charnold Jing-Xiang Xie. Charnold means: 'A Chinese boy is born in Ardmore, Noble Foundation, Oklahoma and the LD is part of Arnold which is an ancient German name meaning Brave Eagle.' He just turned three. I am so proud of him."

The next chapter
In 2005, his time at the Noble Foundation drew to a close, and he accepted a tenure-track faculty position as an assistant professor of plant biology and metabolic engineering in the plant biology department at North Carolina State University (NCSU).

"After I left Noble, I told my students and any audience attending my seminars that I am from Ardmore, Okla., which is the first place I came to in the U.S., and I consider it as my second hometown," Xie said. "Today, he splits his time equally between teaching and research."

"I love teaching," he said. "Teaching is one of the best and most sacred jobs in the world, but I also want to do more research so I can generate new knowledge for my students." He credits the Noble Foundation with propelling his scientific career.

"As a young scientist, the most important thing is to introduce ourselves (by being) published in high impact, peer-reviewed journals – like Science, Nature, PNAS, Cell, Plant Cell, etc.,” Xie said. "I am sure that there was nobody in the academic community in the U.S. who knew me before my work at the Noble Foundation. My research accomplishments established my career in the U.S., and it was an honor to work for my mentors." He was close to many scientists and members of the Foundation staff.

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"On June 13, 2005, Xie and his wife were blessed with the birth of their first child. "I created his English name that is (a blending) of Noble Foundation, Ardmore and Oklahoma," Xie said. "My son's name is Charnold Jing-Xiang Xie. Charnold means: 'A Chinese boy is born in Ardmore, Noble Foundation, Oklahoma and the LD is part of Arnold which is an ancient German name meaning Brave Eagle.' He just turned three. I am so proud of him."

On her worst job
Right out of high school, I worked for one of those loan shark places, where they lend a small amount of money for huge amounts of interest. I hated it. They would try to get me to come up with stories and find out information from a relative so that they could track delinquent accounts. I never was a good liar, so that didn't work out too well.

On how she became a scientist
Around the second grade, I told my mother I was going to be a biologist when I grow up, and she said there was no such job as a biologist.

On her work with viruses
We are forging new paradigms in the field of virology and changing the way people think about viruses. They are more our friends than our enemies. I was first introduced to plants as hosts of viruses during my postdoctoral fellowship. Before that, I worked on human viruses. I find plants a better host for experiments. It is hard to do experiments on humans or even other animals, but plants are great. You can have a whole greenhouse full of genetically identical plants, something you can never do with animals, and no one ever minds when we put plants in the blender.

On the path not traveled
If I were not a scientist, I would be a novelist. It has always been a passion of mine to write for the popular press. I am currently writing a novel, but I rarely have enough time to make much progress on it.
Here, within a few feet of each other, sit two of plant science’s most accomplished researchers: Dixon, the Senior Vice President and Director of the Plant Biology Division at the Noble Foundation, and Lamb, the Director of the John Innes Centre in the United Kingdom. Two decades ago, their careers stood at pivotal intersections. Their thoughtful conversations resulted in decisions that defined their lives and played a supporting role in the Noble Foundation’s development of a plant biology division. It is fitting then, as the division celebrates its 20th anniversary in 2008, that these two men gather once again to peer into the past and examine how it shaped the present. On this night, the pair laugh and talk and remember as though they were home in their native England, hoisting a pint at their favorite pub. They swap stories about their joint research, which has produced more than 100 published papers; reminisce about defining successes and enlightening failures; and sprinkle in anecdotes about their journeys from beginning scientists to leaders in their field.

Most of all, they add their plot line to an intriguing story of how the Noble Foundation and Salk Institute helped foster each other’s plant biology programs. It’s a story that includes famed scientists, two institution presidents and a board of trustees who reshaped the future of the Noble Foundation – as well as plant science research in this country – by taking a bold step into the unknown.
A seed is planted
The Salk Institute, founded by Jonas Salk, M.D., developer of the polio vaccine, began biomedical research in the early 1960s on its campus near San Diego, Calif.

In December 1975, the Noble Foundation made a $9,000 grant to support a visiting scientist at Salk. It was this unassuming gift that served as the genesis of a relationship between the two organizations. “I do not think anyone at that time could have guessed how this small grant would impact the future of either organization,” said Michael A. Cawley, President and Chief Executive Officer of the Noble Foundation. “Clearly, it was like planting a seed.”

Less than two years later, the Noble Foundation made a pair of significant investments in the La Jolla, Calif.-based Salk.

First, a $600,000 grant established the Noble Professorship Chair in Health Sciences which was held by Dr. Salk, and then a $500,000 Noble grant initiated a joint program in molecular/cellular biology.

“That initial scientific collaboration redirected both organizations,” Cawley said. “It set the stage for the Noble Foundation to shift its scientific focus from human health research to fundamental plant science, and it placed the Salk Institute on the edge of developing a full plant biology division.”

Another significant step in the Noble-Salk relationship took place across the Atlantic Ocean during the summer of 1976, though nobody at either organization knew it yet.

Dixon and Lamb found themselves sharing bench space in the same laboratory at the University of Oxford’s School of Botany. Dixon finalized his doctoral degree work, while Lamb entered the laboratory on his first postdoctoral fellowship after graduating from the University of Cambridge. Dixon and Lamb met because they happened to study the same molecular pathways, and their joint scientific interests provided fertile ground for collaboration and friendship.

“I think there was an instant respect between us,” said Dixon, Lamb nodding his head in agreement. “We were like-minded in our lives and our careers.”

The two scientists provided feedback for each other’s research through the remainder of the decade and into the 1980s. They continued their joint projects when Dixon moved to the University of Cambridge to pursue postdoctoral studies in late 1976 before taking his first faculty position at the University of London. Meanwhile, Lamb left the United Kingdom for a new adventure in the United States, a move that eventually impacted both men.

Salk takes its first steps
Four years of productive collaboration between the Noble Foundation and Salk Institute culminated in 1981 with a $1 million grant for the establishment of a cellular biology and plant science program at Salk. Fred de Hoffman, Ph.D., then President of the Salk Institute, tabbed a young Englishman from Oxford named Chris Lamb to guide the fledgling program. Lamb quickly found the Noble Foundation’s support to be invaluable and credits a secondary, $770,000 grant for a joint plant science tissue culture project in 1983 as the genesis of the Salk Institute’s plant biology laboratory.

“As a scientist, I was very appreciative of how the Noble Foundation provided significant seed-funding,” Lamb said. “From that, it was obvious the Noble Foundation had a clear vision that plant science research ultimately fulfilled its mission of helping agricultural producers.”

In 1985, de Hoffman flew to the Great Plains to petition the Noble Foundation Board of Trustees for additional grants, but the car ride from the Dallas-Fort Worth airport to the organization’s Ardmore campus proved eye-opening.

As he drove north, the vast prairie grasslands unfolded before him. He saw family farms and herds of cattle. He witnessed a way of life directly impacted by the outcomes of plant science research. And he changed his mind about his trip’s purpose.

“He stood before the Board of Trustees and said, ‘I might get fired for what I’m getting ready to say, but I don’t want any more money. I want you to start your own plant biology division,’” Cawley said. “Those were powerful words from a powerful man and it sparked the Board to action. They had vision to see how this aligned with our mission and complemented the agricultural programs already in place.”

A division is born
The Noble Foundation Board of Trustees pursued the possibility of expansion with vigor. They traveled to California to review the plant biology program at the Salk Institute, consulted with outside organizations and individuals, and, in the end, decided to move forward.

The Board took measures to launch the Noble Foundation division in 1987. Finding a capable and respected scientist to build the division’s programs stood as the critical first step in the process. The Board assembled a hiring committee that included, among others, Lamb.

In that same year, Dixon traveled to the Salk Institute for a sabbatical with his longtime colleague – a temporary reprieve from the mounting frustrations of university life. Dixon’s dissatisfaction with the university’s fluctuating funding and constant reorganizations brought him to the cusp of change. Lamb saw the potential to match an accomplished scientist with a premier agricultural organization.

“I’ll never forget the conversation,” Dixon said. “We were walking with our wives in San Diego’s Old Town, and Chris said, ‘Although it is not yet on the map, the Noble Foundation has the opportunity to become one of the best plant science institutions in the world because of its stable funding.’ I had never thought of being director of a large science initiative. It

For two decades, the Noble Foundation’s Plant Biology Division has explored plant science for the benefit of production agriculture. This timeline recaps some of the division’s greatest accomplishments and landmark events. Timeline: Andrea Perry

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1988

- The Plant Biology Division is founded. In January, new Division Director Richard Dixon, D. Phil., and the first postdoctoral fellows arrive in Ardmore. Due to limited laboratory space, several researchers start their projects at the Salk Institute in San Diego. The Noble Foundation and the Salk Institute hosted a joint postdoctoral fellows program during the early stages of the Plant Biology Division.

1989

- Principal Investigators Rick Nelson and Marilyn Rossinck are hired, establishing the division’s plant virology program.

1993

- Researchers perform the first transgenic plant field trial in Oklahoma.

1994

- The first successful genetic modification of lignin in plants is reported.

1995

- Plant Biology Division researchers discover the first fungal phosphate transporter associated with phosphate uptake by mycorrhizal fungi. This discovery provides basic knowledge for engineering improved phosphate uptake efficiency in plants.

1998

- AgriBioTech, Inc., acquires the rights to the Noble Foundation’s technology for lignin-modified alfalfa in multiple states.

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What does the Noble Foundation’s Plant Biology Division do?
The Noble Foundation Plant Biology Division conducts basic biochemical, genetic and genomic research for crop improvement, enhancement of human and animal health, and production of novel products in crops.
wasn’t my ambition at the time. I was just beginning to consider the next stage in my career, but the last thing I thought I’d do was take a job in Oklahoma. I don’t think I even knew exactly where Oklahoma was.”

Dixon not only found Oklahoma, but found himself in then Noble Foundation President John Snodgrass’s office the next week. The interviews with the hiring committee went seamlessly, and Dixon became the desired candidate. Snodgrass sent Dixon away with a mandate: Think about what it will take to be successful, and then fax me your proposal.

“I remember thinking we’d have to negotiate all the parameters like you would do at a university so I started and then fax me your proposal. Dixon set out to hire principal investigators that could meet his lofty expectations, and he found a handful early on.

“In the first three years, we were fortunate enough to hire Drs. Rick Nelson and Marilyn Roossinck.” Dixon said. “They are two quality scientists with keen insight and great vision.”

Nelson and Roossinck are still pillars of the division today. Roossinck is considered one of the world’s leading experts on plant and fungal virus evolution and ecology. Her work on multipartite relationships between a virus, fungus and host plant has received international recognition.

“The Noble Foundation is unique,” Roossinck said. “Its dedicated funding for science provides stability in the research and results in highly productive laboratories. It would have been difficult to get funding for plant virus evolution research when I began. If not for the Noble Foundation, I probably would have been working in a field of research that I cared less about.”

Nelson, who is another virologist with a world-class portfolio of publications, is now perfecting the use of a virus to allow scientists around the world to rapidly evaluate a transgene’s function within grasses. As one of the original scientific faculty, Nelson reflected on the organization’s continued commitment to the division.

“We didn’t grow capriciously,” he said. “We grew in measured steps based on our merit and perceived needs. The Board of Trustees provided a steady stream of support through personnel and well-equipped facilities, and we worked to earn it.”

“All the support did not overcome one detrimental factor – the lack of name recognition. A problem eased – fittingly – by another institution’s plant biology program, one created in part by the Noble Foundation.

The Salk effect

While many national and international scientists recognized Dixon as a proven colleague, recruiting valued postdoctoral fellows (postdocs) might have been impossible without the backing of the Salk Institute.

The Noble Foundation and Salk offered joint postdoc positions through the Dixon and Lamb laboratories. Postdocs spent a year and a half in both La Jolla and Ardmore to complete their three-year training cycle.

“The Salk Institute helped us actively form relationships in the scientific community,” Dixon said. “The Salk Institute and Chris were very generous. We were fortunate to have the backing of an excellent organization.”

For Cawley, the sequence of events is poetic.

“It’s simply astounding how all the pieces fell into place,” he said. “The Noble Foundation and the Salk Institute each played a significant role in the development of the other organization’s plant biology program. That’s a successful collaboration that defies expectation and imagination.”

Twenty years later

The Noble Foundation’s Plant Biology Division can celebrate a variety of successes during its 20th anniversary.

What began with a few dozen people has grown to more than 120 individuals, including 46 postdocs, who now come from more than 25 countries around the world to work together at the Noble Foundation.

The division has undergone two significant facilities expansions, including a 48,000-square-foot, state-of-the-art addition which opened in 2002.

“The new building is a visual sign of confidence and commitment,” Lamb said. “That’s important to the continuation of excellence and to keeping the top flight scientific culture that exists here.”

The growth in infrastructure and personnel brings Dixon obvious satisfaction, but it’s the quality of the division’s programs and the recognition they have received in the greater scientific community that provide him with the greatest sense of accomplishment.том
The division operates 11 of the Noble Foundation’s 18 laboratories with expertise in plant biochemistry, genomics, cell and developmental biology, metabolic engineering and plant-microbe interactions.

Through the past 20 years, the Division’s research efforts have resulted in important breakthroughs in understanding plant metabolic pathways, engineering quality traits in plants, understanding the molecular mechanisms that underlie the interactions of plants with both beneficial and disease-causing microbes, and deciphering how plant viruses evolve to cause disease.

However, Dixon said the division’s “flag planting” moment came when it initiated what became an international effort to sequence the genome of *Medicago truncatula* (commonly called “barrel medic”). Information generated from the *Medicago* genome will allow researchers to utilize the plant as the model species for the study of other legumes, including such agriculturally significant crops as alfalfa, soybeans and peanuts.

The product of the Plant Biology Division’s research is no longer limited to agriculture and just the improvement of plants and their productivity.

More recently, Plant Biology Division scientists are looking at the role of conditioned tannins for improved animal health and the treatment of various human diseases, including Alzheimer’s. Additionally, they are playing a central role in developing novel technologies to drive the emerging biofuels industry by engineering dedicated bioenergy crops, such as switchgrass, to have more degradable cell walls and improved agronomic characteristics such as better nitrogen use efficiency and sustainability.

“We have made immense strides and expanded into fields I never would have imagined two decades ago,” Dixon said. “I believe that the Division has now realized the potential that Chris and I saw that summer day in San Diego in 1987.”

A belief that has not gone unnoticed.

Historically, the Noble Foundation had strategically concluded not to apply for outside funding. However, as the Plant Biology Division matured, the leverage and recognition opportunities associated with successfully competing for outside grants resulted in a strategy change. The capabilities, facilities and personnel at the Noble Foundation have drawn interest and funding from state and federal agencies, including the National Science Foundation, Department of Energy and Department of Agriculture, that seek to leverage the institution’s expertise in agricultural plant science.

The Plant Biology Division received more than $7.1 million in new external funding last year alone, providing about 45 percent of the Division’s total funding.

“We’ve been extremely successful in generating external funding,” Dixon said. “You combine successful peer-reviewed grants with our robust publishing record, and that says to the outside world that you’ve arrived.”

### The winds of change

Twenty years have changed Dixon. Sitting in his office, flanked by his friend and colleague, he’s not afraid to admit his point of view has shifted, if ever so slightly.

With the addition of the Forage Improvement Division in 1997, the Noble Foundation now possesses the ability to move plant science discoveries from fundamental plant science through translational research and plant breeding, and out to the field for real-world trials and testing. This pipeline of discovery in a single, integrated set of programs is unique to the Noble Foundation and generates not only knowledge, but tangible outcomes.

Dixon remains a pure fundamental scientist at heart, but he says having an application endpoint now provides a major stimulus for his research.

“The fact that we have ‘applied drivers’ has been really positive for my thinking about basic science,” Dixon said. “Basic science completed in Plant Biology might be used for any number of applications down the road. I do not have a personal interest in actually performing the translational research, but I do derive great pleasure from seeing the final product that comes out of it. My indirect involvement in applied research has also introduced me to a lot of new colleagues in fields such as plant breeding, ruminant nutrition and agronomy, with whom I would not have previously had the opportunity to interact. This has also allowed me to preach the importance of basic, hypothesis-driven science to my applied colleagues. It’s all about discovery.”

With that statement, there is only one question remaining: What discoveries will shape the next two decades of the Plant Biology Division? Dixon thinks for a moment and then says, “The resources, faculty, reputation, culture are all in place to have continued success. Our work in engineered plant quality traits may be what we’ve best remembered for in 50 years. Or it could be something that we’ve not even thought about. You really don’t know and that’s the beauty of all this. I have a belief, though, that this is only the beginning.”

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2007: Researchers in the Plant Biology Division and the Noble Foundation, Forage Improvement research divisions are awarded more than $8 million by the National Institutes of Health (NIH) grant for studies on switchgrass genomics.

2007: Dixon is elected to membership in the National Academy of Sciences.

2007: Dixon receives his first National Institutes of Health (NIH) grant for studies on the natural protective effects of grape seed extract compounds for addressing Alzheimer’s disease.

2007: Researchers with the Noble Foundation’s Plant Biology, Forage Improvement and Agricultural divisions, in collaboration with researchers at the University of Oklahoma and Oklahoma State University, lead the effort to form the Oklahoma Bioenergy Center, a state-funded initiative to develop technologies to enable the economic production of cellulosic ethanol in the state of Oklahoma.

2008: The first crystal structure of a plant cytochrome P450 is determined by division scientists. This opens up the possibility of designing new catalysts for plant metabolic engineering.

What was your first job?

Everybody starts somewhere, and for scientists that initial foray into the work force is as varied as the research they explore. More than 140 scientists from 29 different countries call the Noble Foundation’s Ardmore, Okla., campus home. No matter their native country, each experienced the harsh realities of punching the clock and the satisfaction of that first paycheck. Below, four scientists look back on the road of life to the starting line of their careers.

**Maria Monteros, Ph.D.**
Assistant Professor
Forage Improvement Division

“My first job was as a gopher at a construction site in Seoul, Korea. I hauled cinder blocks and cement bags wherever they were needed. It was a dirty, dangerous, hard job, but I was 19 years old, and I wanted to backpack through Europe after college, so it was worth it.”

**Dong-Man Khu, Ph.D.**
Postdoctoral Fellow
Forage Improvement Division

“When I was 13 years old, I wrapped gifts during the holiday break at a local mall near where I grew up in Guatemala. I used the money to buy gifts for my family and friends, but I could only afford to buy something small like a piece of chocolate for most of them. It was the thought that counted.”

**Kelly Craven, Ph.D.**
Assistant Professor
Plant Biology Division

“I was a busboy at a Mexican restaurant in Tempe, Ariz. I was 14 years old, and, after work, I’d carouse with the bartenders. I learned more than how to bus a table there. On the plus side, I still love Mexican food.”

**Nikki Charlton, Ph.D.**
Postdoctoral Fellow
Plant Biology Division

“My first job was as a dental hygiene coordinator in Edmond, Okla. I was 19 years old, and, on my first day, I fainted during an extraction. I ended up in the chair with the oxygen mask on.”

For more than half a century, the Noble Foundation’s agricultural consultants have provided farmers and ranchers with the knowledge and support to maximize the potential of their operations. Below, four families tell how one organization changed their lives.

“Having people” is a phrase synonymous with having resources and information to assist you in your business. This concept is not new to the Noble Foundation.

In fact, one aspect of founder Lloyd Noble’s agriculture enhancement and land/soil stewardship mission was to assist farmers and ranchers in Oklahoma and Texas. For more than six decades, Noble Foundation consultants have been working with agricultural producers to achieve their financial, production, stewardship and quality-of-life goals by providing direct consultation service – at no cost to the agricultural producer.

Today there are four consultation teams, which include experts in the areas of wildlife, pasture and range, horticulture, soil and crops, agricultural economics and livestock that work with more than 1,500 producers. Lloyd Noble knew the value of “having people” long before it was popular.

Below, four producers share their experiences of working with the Noble Foundation consultants who assist their operations.
in developing recordkeeping systems, understanding Foundation agricultural economists further assisted improve the “marketability” of their herd, including the Campseys about herd health and vaccination have learned about ranching and grasses has been their local veterinarian told them about the Noble and believed they were making progress. In 1995, were just happy to be out in the wide open spaces calf in the fall.”

herd included some of every color, and they had cows and a foreman,” Julie Campsey recalls. “The man managing their part of the ranch. Michael’s father in 1993, and by 1997 they were

Two years passed uneventfully. The Campseys were just happy to be out in the wide open spaces and believed they were making progress. In 1995, their local veterinarian told them about the Noble and believed they were making progress. In 1995, their local veterinarian told them about the Noble Foundation and its consultation services. “We contacted the Noble Foundation, and our program has never been the same,” Michael Campsey said, adding that 90 percent of what they have learned about ranching and grasses has been from their consultation team.

The Noble Foundation consulting team taught the Campseys about herd health and vaccination programs, Beef Quality Assurance principles, how to maximize a 45-day weaning program and how to improve the “marketability” of their herd, including factors such as animal uniformity, timing of sale and breeding for certain market endpoints. Noble Foundation agricultural economists further assisted in developing recordkeeping systems, understanding the production value of each cow on the ranch, and balancing feed rations and managing their grasses so that no hay is used for the cow herd.

The Campseys’ herd was reduced to 200 head by 1997 because of the ongoing drought situation. In addition to destocking, they initiated a serious rotational grazing system. “We had survived on less than desirable native pasture up to that point,” Michael Campsey said. “The Noble Foundation consultants taught us to let our grasses rest. By doing so, the native grasses became stronger, and the good grasses were able to flourish.”

In addition, the Campseys changed to a spring calving herd to better utilize their grasses. They also began culling the herd and adding Angus-based females as replacements to establish uniformity. They introduced Charolais bulls to maximize growth traits and hit targets for their marketing program, which now includes a 45-day weaning system. All of these changes were suggested by the Noble Foundation consultants who assisted the Campseys with the logistical aspects. They now have a 60-day calving season in the spring, which not only makes the calf crop uniform, but is a management and labor time saver.

The Campseys also began a wildlife management program for their enjoyment and to diversify their income. The ranch is now enrolled in the Texas Parks and Wildlife Department “level 3 managed lands program” for the deer population. “Hunting is a big part of our overall program now, and we lease several pastures, primarily to folks in the Dallas-Fort Worth metropolis and Wichita Falls, Texas, area,” Michael Campsey said. They also donate 10 hunting blinds annually to a December deer hunt for underprivileged boys held by the Northwest Texas Field and Stream Association.

“We can always count on our Noble Foundation team to help us when needed,” Julie Campsey said. “Our team is as hands-on as we want them to be, and they are always accessible. We talk to them regularly. We participate in a number of their programs annually and, even though we have been with them more than 10 years, we still rely on them. We will always want to have them as part of our management plan.”

Jeffrey Reuter
El Reno, Okla.

The Reuter family has deep roots in the El Reno area, as previous generations homesteaded their land in Oklahoma’s historic land runs. Jeffrey Reuter represents the third generation to make his living from this property. Their operation includes 125 mixed breed commercial cows with Charolais bulls selected by the Noble Foundation, and they run about 350 stockers year around. They also raise alfalfa and rye primarily for grazing. In addition, Reuter runs a stocker-feeder buying company.

Reuter found out about Noble’s consultants by chance. He was on a farm tour in 1992, and, in the literature provided, there was an article about the Noble Foundation. He made a phone call that has resulted in a 16-year relationship. “If I had to pick one thing that the Noble Foundation has helped me with the most, it would have to be my management skills,” Reuter said. “They have greatly improved my skill level and have made me a better manager.”

Reuter credits his consultation team with assisting him with feeding programs, application, analysis and usage of fertilizer, better production of improved grasses, including winter rye, developing stronger

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-Time management and efficiency are also areas of their expertise, and by implementing their suggestions I have become a better manager,” Reuter said. “I no longer think my cattle have to be physically looked at every day. This has been a big time saver and money saver in terms of fuel and wear and tear on vehicles.”

Reuter has also developed a wildlife program and gains additional income through hunting leases. “Noble has been instrumental in helping me develop leases and has provided valuable insight into how to develop a hunting clientele,” he added.

Reuter’s son, Cole, is involved in the family operation and represents the fourth generation for this Oklahoma family. Reuter’s other son, Ryan, was also greatly influenced by the Noble Foundation team members as they made visits to the ranch while he was growing up. After serving as a livestock consultant on one of Noble’s consulting teams, he returned to school and received his doctorate degree from Texas Tech University in

Micheal and Julie Campsey
Jacksdor, Texas

The Campseys will be the first to tell you they started their ranching venture with an urban background, limited agricultural knowledge and a herd of cows that featured every color in the rainbow.

They moved to one part of the ranch bought by Micheal’s father in 1993, and by 1997 they were managing their part of the ranch. “The overgrazed ranch came with about 300 cows and a foreman,” Julie Campsey recalls. “The herd included some of every color, and they had been selected on the criteria that they would have a calf in the fall.”

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“We have enjoyed working with the Noble Foundation, and our bottom line has definitely improved.”

Jim Covington

Noble Foundation cooperator

2007. Now he is part of the Noble Foundation Agricultural Research team.

“They have made me a better steward of my land and have put in practices that have improved my bottom line,” said Reuter, who added the consultation service is for those “who aren’t afraid to make changes.”

Jim and Karan Covington
Pottsboro, Texas

The Covingtons are small operators, and they have found the consultation services of the Noble Foundation invaluable. Jim is an independent contractor in the defense and aeronautics fields, and maintains their cattle operation around his day job.

His family has owned land in Pottsboro, in Grayson County, Texas, since 1947. Hereford cattle have always been the breed for the family. The Covingtons have continued that tradition, but have recently diversified by adding Angus genetics to their herd.

The Covingtons began working with the Noble Foundation about seven years ago when they observed the team assisting a neighbor. “I consider the team a part of my ranch. It’s like having them as part of my staff,” said Jim Covington, adding that there is no way he could put a dollar figure on the assistance provided by the Noble Foundation.

The Covingtons have continued that tradition, but have recently diversified by adding a small stocker operation and adding Angus genetics to their herd. The Covingtons have started a small stocker operation of about 70 calves.

“The Noble Foundation has walked us through every step of the stocker operation,” Covington said. “We work together on everything. We jointly consider the options and when and where to sell the calves.”

The couple handles almost all the work themselves and are joined on many weekends by their daughter, Amy, who resides in the Dallas-Fort Worth metroplex.

“We have thoroughly enjoyed our seven years working with the Noble Foundation, and our bottom line has definitely improved,” Covington said. “We probably visit with our team members at least six times a year in person, and we can call or e-mail them for their input on various practices at any time. Our program has benefitted greatly from having them as an integral part of our operation.”

Jack and Jackie Cunningham
Ardmore, Okla.

The Cunningham family first contacted the Noble Foundation in 1982, and the relationship has continued for 26 years.

Jack Cunningham moved to the Ardmore area from southwest Texas and soon learned that the land, climate, crops and cattle programs were completely different than what he had experienced. Today, he is joined by son Jackie as they run their operation.

“The Noble Foundation consultants are knowledgeable in every aspect, and they are the greatest consultants you could ever have. The service they offer is unprecedented,” describes Jackie, with Jack adding that he talks to his team members on a weekly basis and they are always willing and ready to talk through a situation.

The Cunningham operation started as a purebred Brahman herd, but by 1989 they had changed to a stocker operation. In addition, they grow pecans and raise wheat.

“They have taught us so much about each part of our operation,” Jack Cunningham said. “Some of the areas that stand out in my mind over the 26 years include soil fertility, health of the stockers, crop issues and now even crop rotation as we are considering adding milo and soybeans.”

The Cunninghams have learned to evaluate charts provided by the Noble Foundation that document trends in the stocker industry and to make business decisions based on information.

Jackie Cunningham also adds that in the pecan segment of their operation, the Noble Foundation has provided tremendous assistance with insect management and fertility. “One point I would like to make is that they have always been at the top of their game,” Jack Cunningham said. “Noble has been part of our management team for more than 25 years, and their information is always current. They are always looking to the future.”

Jackie Cunningham agrees wholeheartedly. “No two places, no two operations, no two sets of land are the same,” he said. “Everyone has a different caliber of management and resources, yet Noble has the expertise and wisdom to help all of them. We have met many other landowners who utilize their services, and the Noble Foundation consultants pinpoint a great program for each.”

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How are producers staying profitable?

“We tend to dwell on the negatives of the economy, but let’s not forget that there’s a lot of opportunity also.”

Evan Whitley, Noble Foundation consultant

The dynamics of the cattle industry are changing. Farmers and ranchers face intense pressure from rising fuel costs, escalating grain costs, and sky-high fertilizer and chemical prices. In fact, almost everything in the expense column is higher than last year, while income items have not increased.

Below in Legacy’s Agriculture Roundtable, Noble Foundation consultants examine a few tools and methods cattle producers can utilize to increase profitability and maintain their operation.

Evan Whitley: Let’s start with – you cannot improve what you don’t measure.

Hugh Aljoe: Agreed. Eighty percent of a profitable producer’s time is spent on the 20 percent of what is most profitable. You must commit time to working on business by assessing and reassessing records, and knowing the dollars in and out.

Dan Childs: Hard work in production agriculture is not necessarily the hard physical work any longer – the hard work today is putting data in and getting the answers to your questions. As but one example, beef cattle enterprises must now look at the productivity level of each cow. Producers need to look at netting a higher return per animal unit.

Whitley: Producers should also look at those producers who are profitable. What is it they do that separates them from the rest? I think you will often find it is the nonglamorous things. I have noticed that successful operators have a set of goals – and good records. They have a plan in place and then work to achieve that plan. Also they seek new information and are not opposed to using it.

Jim Johnson: (nodding in agreement) A profitable producer is innovative.

Whitley: Further, you can’t operate in the same marketing routine every year any longer.

Childs: As a producer creates genetic attributes in their calf crops, then other marketing options open up to them, such as age and source verification, maternal and reproductive traits.

Aljoe: As a producer creates genetic attributes in their calf crops, then other marketing options open up to them, such as age and source verification, maternal and reproductive traits. Marketing is key to profitability, and if you are going to create a product, you must find a market for it.

Aljoe: Producers further need to consider how they can utilize grass to add pounds to calves after weaning through preconditioning and backgrounding programs; however, stocking rates are critical with the costs of fertilizer this year. A producer needs to look at anything that adds a cost, and knowing how many animal units you can conservatively handle is paramount. If you back your stocking rate off 10 percent, then you can carry calves through the preconditioning phase, and if you destock by 30 percent, then you can potentially take those calves to 800 pounds before selling, depending on forage quality, type of forage and, of course, rainfall.

Johnson: Key to your point is the “cost of fertilizer” – producers need to understand that they need to fertilize for what they need. Do not take the shotgun approach to fertilizing or any other aspect of agriculture. Do what you can right.

Whitley: We tend to dwell on the negatives of the economy, but let’s not forget that there’s a lot of opportunity also.
Leading tours is a mainstay of my job as Director of Public Relations for the Noble Foundation. For me, it’s an opportunity to throw open the doors and show off the world-class plant science, forage breeding and agricultural programs that occur daily on our 800-acre campus in Ardmore. It’s a chance to wow visitors and answer questions.

When I reflect on the many tours during the last few years, my mind immediately snaps back to one student, whom I’ll just call “Stanley.”

Stanley sat on the front row during the opening presentation for a tour of young leaders. His hair was neatly combed. His clothes pressed. He wore thin-framed glasses, which made the young teen look dapper and astute like a miniature college professor.

Unlike most students whose attention invariably wanders, Stanley’s eyes never strayed from me. He was clearly the smartest kid in a class of smart kids.

As I closed out the introduction, I offered an opportunity for questions. Stanley—who clearly anticipated this moment—shot up his hand first.

“What’s your favorite plant?”

He asked, smiling.

I went numb. I had nothing. Fifty-two pairs of eyes rested on me in increasing anticipation. Turns out Stanley had been working—in his room at home, mind you—on mastering the ability to create and load gels, a scientific tool used to visualize DNA. I finally answered with an apologetic, “I don’t know,” which elicited gleeful laughs from the other students. I promised Stanley we’d find a scientist to provide him a suitable answer.

While initially stunned by Stanley’s question, I quickly realized I was dealing with a future scientist. Scientists (even young ones) are curious people and questions often serve as the inspiration for their research. Richard Dixon, D.Phil., Plant Biology Division Director, has been a scientist for more than four decades. Dixon arrived at the Noble Foundation 20 years ago, his curiosity drove him to study lignin—a substance that gives all plants their structure.

“Tissue culture is where we create plants in the laboratory. Sometimes the questions lead to unexpected results. Noble Foundation researchers study condensed tannins as a way to reduce pasture bloat, but now scientists are quickly finding that tannins may help in the fight against Alzheimer’s and cancer. And switchgrass, which was originally studied at the Noble Foundation as part of range management, may fuel our cars in the next decade as part of the emerging cellulosic ethanol industry. There are countless more examples.”

As for Stanley, he finally met his scientist. Maria Monteros, Ph.D., assistant professor, wrapped up her talk as the last speaker of the day, and the floor opened up to questions. Again Stanley was ready. He looked Dr. Monteros square in the eyes and asked: “What’s your favorite plant?”

“What?? Favorite plant?”

I was nailed with the “gel” question, and now the scientist lands the “favorite plant” question. I knew one: Alfalfa. Easy. I immediately stopped the laughter subsided, Stanley, undeterred by the momentary disruption, asked his earlier question. Dr. Monteros—partially stunned, but more so impressed—promptly provided him a satisfactory answer.

As I waved goodbye to their bus that day, questions still remained. What will happen to these students? What challenges will they face? How will they overcome them? The answer is simple and vaguely familiar: I don’t know, but with kids like Stanley, I’m confident the answers will amaze us all.

Samuel Roberts Noble

Lloyd Noble often said his father, Samuel Roberts Noble, was the most generous man he ever knew. When Lloyd Noble, the pioneering oilman and philanthropist, established a foundation to assist agricultural producers in 1945, he named it not after himself, but after the man he had admired above all, his father (pictured).

Samuel Roberts Noble came to Oklahoma when it was known as Indian Territory and opened a hardware store with his brother. It was during Lloyd’s formative years that his father instilled in him the values of hard work, fairness and generosity that shaped the rest of Lloyd Noble’s life.

While many credit Lloyd Noble’s vision and generosity for establishing and guiding The Samuel Roberts Noble Foundation, he would undoubtedly pass all credit on to his father.
Home on the range

The Noble Foundation’s Agricultural Division consults with farmers and ranchers located within a 100-mile radius of the institution’s Ardmore campus. Within that area, there are more than 2.8 million cattle, making livestock the predominant agricultural industry and the focus of much of the Noble Foundation’s efforts.