

IN THIS ISSUE

Biotechnology and Emerging Technology in Agriculture

- 3... Feeding the World
- 4... Bringing CSI Excitement to the Classroom
- 5... USDA Grant Launches Biotech Program
- 6... Power Your Classes with BioEnergy
- 7... Bio-Security: Protecting Our Food and Fiber System
- 8... An Agricultural Education Report Card
- 12... Agriscience Attracts Students
- 16... Agriscience Students Earn Scholarships, Accolades
- 17... Getting a Grasp on Global Issues
- 18... Biotechnology and Agricultural Education
- 19... Knowledge Key to Alumni Advocacy
- 20... Opening Doors of Opportunity
- 21... Teacher Resources
- 23... FFA News
- 24... American FFA Degree Update

Biotechnology Enhances Program

if you pay attention to agriculture media, you've probably noticed an increasingly rapid biotechnology drumbeat in the content. From disease- and herbicide-resistant seeds to enhanced animal health products, agriculturists are adopting biotechnology products at a rapid pace. In fact, a recent report notes that the billionth acre has now been planted using biotech seed.

Cowanisque Valley High School in Westfield, Pa., serves a very rural student population. There are 380 students in grades 7-12, and about 140 of them enroll in agriculture courses annually.

Andy Boyer, who teaches agriculture at the school, describes it as "110 percent rural," and estimates 30-40 percent of his students have a direct connection to production agriculture. Boyer believes the future for many of his students includes biotechnology, so he began offering a course in the subject six years ago.

Rapidly Evolving Subject

"Biotechnology is a subject that really captures my students' interest," Boyer says. "Because the technology is developing so rapidly, I've never taught the same class twice. I cover animal applications, plant applications - including plant tissue culture and some microbiology - and ethics, including cloning and evolution issues. I'm adding information on producing pharmaceutical products in plants via 'pharming' techniques, as that topic is increasingly relevant in our geographic area."

Boyer continues, "Because I teach the topic using a lot of hands-on activities, it is an area of science in which many different types of students can do well. However, this is also a class that attracts high-level academic students. It is a good mix of students and pushes my more traditional agriculture students to excel."

Boyer teaches in a 72-minute block, using lecture, lab and individual work time strategies during each class session. "I use a lot of group projects where the students work on things together. They really get into the activities and, by doing the activities, learn the science associated with why things happen the way they do," he says.

Resources Available

To launch the program, Boyer used funding provided by the school district. He purchased an autoclave, glassware and a laminar flow hood with the original funding. Boyer uses sections from the National Council for Agricultural Education's Biotechnology for Plants, Animals and the Environment curriculum (available at www.teamaged.org/PGS/index2.htm#7) along with activities and lab ideas he's collected over time, many from the Internet. He also supplements the course using the text, "Biotechnology, An Agricultural Revolution" from Delmar Learning (www.delmarlearning.com).

Boyer encourages teachers to include biotech in their agriculture courses. "Many agriculture career paths will require an understanding of basic biotechnology," he says. "Don't let funding be a barrier to getting started. There are grant funds available, and you can find many inexpensive options for labs."

This issue of *FFA Advisors Making a Difference* focuses on biotechnology and emerging technologies in agriculture. Turn the page for more ideas on enhancing your program in these exciting areas.





focused

For the 20,000 people of Syngenta, farmland is not just another place to do business. It's the place we call home. You see, Syngenta is dedicated to innovative crop protection, seed solutions and sustainable agriculture around the world. And nothing else. In other words, we're passionately focused on seeing crops do well. Just like someone else we know.

www.syngentacropprotection.com



FFA Advisors Making a Difference is published eight times a year to assist FFA advisors in making a positive difference in the lives of students.

Publication Staff

Ernie Gill, Editor
Jeri Mattics Omernik, Managing Editor
Jody Mattics, Graphic Design
Amber Striegel, Communication Specialist
Lynn Hamilton, Contributing Editor

Correspondence and Address Changes

All correspondence should be sent to Ernie Gill, editor. Old and new addresses, including label, should be sent to Ernie Gill, editor. Both should be mailed to:

FFA Advisors Making a Difference
6060 FFA Drive
P.O. Box 68960
Indianapolis, IN 46268-0960

You may send electronic messages to the editor at egill@ffa.org or to the managing editor at jmo@rmmc.biz.

The National FFA Organization is a resource and support organization that does not select, control or supervise state association, local chapter or individual member activities except as expressly provided for in the National FFA Organization Constitution and Bylaws.

Important Contacts

FFA Staff	317-802-6060
FFA Ordering	1-888-332-2668
FFA Alumni	317-802-6060
NAAE	1-800-509-0204
The Council	1-800-772-0939
FFA website	http://www.ffa.org

The FFA Mission

FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education.

The Agricultural Education Mission

Agricultural education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems.

Rocky Mountain Marketing Communications, Inc.
Editorial Consultant
Published by Larry D. Case, Coordinator, Agricultural and Rural Education, U.S. Department of Education
This publication is available online at
[\[www.ffa.org/media/html/med-pub-index-htm\]](http://www.ffa.org/media/html/med-pub-index-htm)

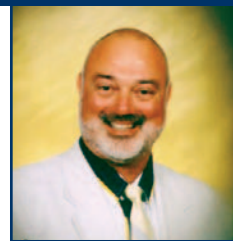
Watch for the LPS Logo



The logo shows how this issue of *FFA Advisors Making a Difference* relates to Local Program Success, a national initiative to strengthen agricultural education programs. You'll see this icon on all FFA materials. The shaded apples show which areas the materials address.

Perspectives

Feeding the World



By Thomas Avant
Agriscience Teacher, Pitkin High School, Pitkin, Louisiana

how will agriculture continue to feed the world? How will we modify plants and animals to be more disease resistant and productive? How will we protect consumers against bacterial pathogens that reside in our agricultural products and protect our plants and animals against pests and disease?

These are all questions that concern production agriscience students as well as students interested in biotechnology. In our agriscience classes at Pitkin High School, I teach production agriscience. In today's world, it is imperative for production agriculturalists to be informed about biotechnology that can affect their businesses. It is impossible to separate today's agriculture from biotechnology. For instance, ask a soybean farmer if he has heard about Round-Up Ready soybeans. Or, consider the possibility of milk goats being cloned and genetically modified to produce human proteins in their milk, and that milk being processed by a pharmaceutical company to produce much-needed medicine for human consumption.

How can we, in production agriscience, ignore the importance of biotechnology in agriculture? We can't, and for this reason I have been actively working with LSU's Microbiology, Molecular Biology Outreach Program with a grant from the Howard Hughes Medical Institute. Agriscience teachers from across our state attend a one-week workshop where they learn to work with microbes that have agricultural applications and how to work

with DNA. After teachers have attended this workshop, they may borrow all of the equipment used in the workshop and use it in their classrooms. I feel that it is very important for all high school agriscience programs to become serious about this field.

Our students are also involved in an environmental project with Dr. Eric Achberger at LSU. We have collected fecal samples from all animal species that might possibly pollute the streams in our area, from wild animals to local livestock. My class isolated *E. coli* from these samples and delivered them to LSU where DNA fingerprints were run. Every species of animal has slightly different strains of *E. coli* thus giving a unique DNA fingerprint when examined. When *E. coli* pollution is found in a body of water, DNA fingerprints can be run on these organisms and compared with the bank of known DNA fingerprints to identify which animals are polluting our streams. It is possible a dairy farm could be blamed for polluting a stream when the real culprits are a family of beaver further upstream. In fact, we have already established that beaver are polluting our streams and lakes at Pitkin.

I hope that my fellow agriscience teachers understand and accept that biotechnology is here to stay and that it is an extremely important area in today's agriculture. It would benefit all of us to be better informed and incorporate this most important area into our curricula.



Bringing CSI Excitement to the Classroom

florence, S.D., is a small, rural community surrounded by fields of wheat, corn and soybeans, as well as pastures full of grazing cattle. At first glance, Florence High School (student population 87 in grades 9–12), might not appear to be on the cutting edge. But open the front door, and you'll find that things aren't always as they seem.

Jim Chilson, a veteran teacher with 30 years of classroom experience, chuckles when he's asked to explain the agriscience program he's developed in Florence. "My background is in animal science. I started in the classroom teaching agriculture and biology because the school needed a science teacher as well as an agriculture teacher."

Chilson continues, "I developed an interest in wheat breeding and started spending my summers working as a field inspector for the South Dakota Seed Inspection Service. I learned basic biotech skills through that job. We were using gel electrophoresis to identify seeds long before CSI became a big hit on television and worked the technology into their story lines."

From Biology to Biotech

Chilson says his personal interest in agriscience led to starting the agricultural education program at Florence in 1990. "This is a rather unusual agriculture program because we don't have an agricultural mechanics shop," Chilson says. "We have a science lab, and the curriculum is focused on science in agriculture."

Chilson requires his science students to participate in the school's science fair and his agriculture students to participate in the agriscience fair. Chilson helped start South Dakota's state-level event in the early 1990s, and 20 of this year's 45 state-level participants were from Florence.

Along with plant and animal science courses, Chilson offers a biotechnology course. "I incorporate lots of lab work in all of my agriculture classes," Chilson says. "In the biotech course, I include a lab on DNA extraction, and it definitely gets the students interested. I use the students' interests in agriculture to help them understand science. If I can pique their interest in science, I can get them on their way to good careers."

Chilson estimates that approximately 65 percent of his students come from production agriculture backgrounds. However, not many will be returning to the area's farms and ranches. Of the 10 seniors who will be graduating from his agriscience program this year, only two or three will go into production agriculture.

Opening Doors of Opportunity

Pride is evident in Chilson's voice as he explains that three of his senior-level students—one of whom is his son—have been accepted into the agricultural engineering program at South Dakota State University. Chilson's son, Josh, was just named the South Dakota Star in Agriscience for his biodiesel research. Another student, Eric Simonton, is working on converting biomass (corn stalks, switch grass, etc.) to ethanol.

Chilson recently attended the Intel International Science and Engineering Fair (Intel ISEF) in Phoenix, Ariz., with the three students, each of whom had earned the opportunity to participate in the event



Eric Simonton works on his biomass project.

because of their work at qualifying fairs. The Intel ISEF [www.sciserv.org] is the world's largest pre-college celebration of science. Held annually in May, the Intel ISEF brings together over 1,400 students from more than 40 nations to compete for scholarships, tuition grants, internships, scientific field trips and the grand prize: a \$50,000 college scholarship.

Chilson has encouraged the students in their alternative energy endeavors. "We do not have to put guards around our corn and soybean fields like we do around our oil fields," he says. "The more energy we can produce here at home, the better shape we'll be in as a nation in the future."

Professional Development

Chilson advocates and exemplifies lifelong learning. He attends in-service training workshops every summer and tries to focus on science-related topics. Chilson also stays in touch with the industry through contacts from his alma mater, South Dakota State University.

He offers a few words of wisdom for his colleagues. "The more knowledge you possess, the better job you'll do serving your students. Your employability as a teacher is much more assured if you have a strong science background. If you can teach science, you're that much more valuable to a school district"

USDA Grant Launches Biotech Program

have you ever attended a professional development workshop and thought to yourself, “My students would really get into that – maybe I should add it to my program?”

After attending an “Exploring Biotechnology” workshop and deciding the topic was a good fit for his program, Michael Johnson pursued a USDA challenge grant to fund a biotech program. The Wake Forest, N.C., high school agriculture teacher was successful in his grant application and is pleased with the progress made to date. Johnson says, “I’m not a great grant writer. The USDA staff was great to work with. They answered lots of ques-



Johnson assists a student using a pipette during a lab.

tions and provided assistance every step along the way.”

Getting Started

“Wake Forest is located about 30–40 minutes from Research Triangle Park,” Johnson explains. “A significant part of the economy is driven by biotechnology-based businesses, so our students see lots of career opportunities in the field. I discussed

adding the biotechnology course with administrators, science teachers and students and all were supportive, so I completed the USDA grant application. The grant request was successful, and we started a semester course using the grant to purchase lab tables, an autoclave and other equipment.”

Integrating with Academics

Now, Johnson says the biotechnology course is the focal point of his program’s strength. “We offer the biotech course to students at the sophomore level and above,” he says. “As prerequisites, they have to have taken biology or my introductory agriscience course or have to be referred by a science teacher. One of the neat things about this has been that the science teachers have greater respect for the agriculture program and envy our equipment.”

“The course attracts students into our program who would not otherwise enroll,” Johnson continues. “These students frequently say things like, ‘I don’t want to be a farmer. Then, they get interested in the biotechnology course and enroll in our advanced agriculture courses. Because we teach the information in an applied manner, the students can connect it to the real world.’”

Johnson chuckles as he relates a story of student success. “The class was working through a unit on Mendel’s genetics theory, and the light bulb suddenly clicked on for this student. He came up to me and said, ‘We studied this for two weeks in biology, and I never understood it. We’ve been talking about it for three days in your class and now I get it!’ He was so

excited. Those are the moments that make teaching so rewarding.”

Instructional Resources

Johnson uses the National Council for Agricultural Education’s Biotechnology for Plants, Animals and the Environment instructional materials (available at www.teamaged.org/PGS/index2.htm#71) as the base for his curriculum.

“The materials include a lot of lab activities, and we run with it from there. My students are required to keep lab notebooks, just like students in science courses, and they

“When you’re in a school where you’re serving non-traditional students, offering a biotechnology course is a great choice. It attracts students who wouldn’t consider taking an agriculture class, but then they tend to take additional agriculture courses.”

receive science credit for the course.” In addition, Johnson relies on Carolina Biological for many of his supplies.

Wake Forest Rolesville High School serves about 2,000 students on the outskirts of Raleigh. Johnson has 85 unduplicated students in his agricultural education program, most of whom call the suburbs home.

Serving Students

“When you’re in a school where you’re serving non-traditional students, offering a biotechnology course is a great choice,” Johnson says. “The course attracts students who wouldn’t consider taking an agriculture class, and they tend to take additional agriculture courses.”

Johnson encourages teachers who are hesitant to reconsider. “Once you get started teaching biotechnology, you’ll find it very rewarding. Don’t be scared to try something new. I have a lot of fun teaching this course. Just get in and get going, and you’ll be fine.”

Power Your Classes with Bioenergy

today, the United States imports 27 percent of its raw energy materials—primarily petroleum products—and that gap is expected to grow to 38 percent by 2025, according to the U.S. Department of Energy.

Gasoline is up an average of 38 cents per gallon from last year, and energy officials predict that prices will stay high through at least 2006. Natural gas prices, a key component of electricity generation, are through the roof as well, and imports are expected to double over the next 20 years to keep up with increasing U.S. demand. Is relief in sight?

Alternative Energy and Agriculture

Good news may be on the horizon. You and your students could be part of the solution by learning more about renewable energy resources, many of which can be produced by one of America's greatest resources: the U.S. agricultural industry. Ethanol and soy biodiesel are being produced from two of the U.S.'s most plentiful crops—corn and soybeans.

Farmers are harvesting an additional crop from the winds that gust over their land. Wind energy generation in the U.S. has increased more than 350 percent since 1996, and most of the wind turbines are churning over farmland. Energy derived from biomass is garnering a lot of attention, as it can generate electricity from animal waste, timber byproducts or energy crops such as switchgrass or hybrid varieties of poplar and willow trees. Solar and geothermal energy are also options that farmers are exploring to offset high utility bills.

Nationwide, farmers are finding that by producing or using the raw energy

resources on their land, they're able to supplement their incomes and provide renewed vitality in the rural landscape, in addition to helping reduce dependence on foreign sources of energy. In a number of cases across the country, FFA chapters have started their own bioenergy projects, helping to reduce their school systems' utility bills and gaining hands-on experience with new technology.

There are federal funding sources available to encourage implementation of such projects, such as the Perkins Grant (www.pcc.edu/pavtec/perkins/default.htm) or U.S. Department of Agriculture Secondary and Two-Year Postsecondary Agriculture Education Challenge Grants program (www.csrees.usda.gov/about/offices/serd_funding.html). Your state may have additional incentives to encourage school-based renewable energy initiatives; visit (www.dsireusa.org) for a list of each state's incentive programs.

If you're worried about the amount of time you'll have to invest to create new curriculum materials for renewable energy instruction, don't. Virtual libraries are full of materials for your use. Below is a list of web-based instructional resources to get you and your students started on the road to renewable energy.

Instructional Resources Available

Renewables Are Ready Teachers Guide—Curriculum guide by the Union of Concerned Scientists; provides junior and senior high school level lesson plans for wind, solar, photovoltaic and biomass, as well as policy issues that arise when implementing renewable energy in local areas. This free, 95-page Adobe Acrobat download is available at (www.ucsusa.org/documents/Renewablesready_full_report.pdf).

The U.S. Department of Energy sponsors an education page full of a variety of renewable energy curriculum sources. Most are free downloads. To review, click on (www.sustainable.doe.gov/municipal/edtoc.shtml).

The U.S. Department of Energy's Energy Efficiency and Renewable Energy division maintains an educational page as part of its website. Teachers of all grade levels can download free instructional materials, as well as ideas for student projects on this comprehensive, easy-to-navigate website. (www.eere.energy.gov/education/learning.html).

The Illinois Environmental Protection Agency and the Waste Management and Research Center provide a wide variety of educational resources by topic; and energy curriculum materials can be searched by 16 categories and filtered by grade level and type of instructional material. Learn more at (www.greeningschools.org/resources/curricula.cfm).

Spirit Lake High School in Spirit Lake, Iowa, owns and operates two wind turbines to power the school's electricity needs, as well as to sell extra energy to the local utility. Faculty involved with the project have developed free curriculum materials regarding wind energy, which are available at (<http://www.spirit-lake.k12.ia.us/dist/wind/>).

The Laurentian Environmental Center, owned and operated by Moundsview Public Schools in Minnesota, also provides wind energy information. Their curriculum guide and corresponding CD on wind energy are available for \$25 by visiting (www.laurentiancenter.com/windyclassroom/).

Biosecurity: Protecting our Food and Fiber System

Since September 11, 2001, U.S. citizens have a better understanding of our vulnerability and the ongoing need to secure key assets and sectors of our economy from intentional attack. This heightened level of awareness not only includes defending the nation from direct attacks to people, but also from attacks that attempt to disrupt our country's ability to feed itself and the world.

A single plant or animal disease outbreak not brought quickly into check could drastically affect our ability to keep our animals and plants healthy. Furthermore, an outbreak, even on a very limited scale, could undermine consumer confidence in the food supply if it isn't managed well.

Defending Against Disaster

Events in Europe, including the foot-and-mouth disease outbreak in Great Britain in 2001, have shown the devastating effects that can occur from even a slight delay in detecting a highly infectious animal disease agent in the livestock population. Plant diseases caused even more devastation in Europe in the 19th century, creating the Irish Potato Famine that caused the ancestors of many Americans to flee to the United States to avoid starvation. Avoiding such a plant or animal disease in our country during the 21st century requires a cooperative effort among the federal and state governments, our universities, and the public.

Agriculture and the larger food and fiber system have many characteristics that make them vulnerable. An intentional effort to introduce contaminants into

our food supply or an interruption in the flow or availability of food products would instill fear and could be very disruptive. Our agricultural system is large and contains numerous global interconnections. This makes the task of provide complete control and protection is very difficult.

Biosecurity Principles

Biosecurity, simply stated, is the practice of protecting and isolating assets (animals, plants and various input products) from biological agents. From a veterinary medicine point of view, biosecurity is also viewed as part of an "infection control" strategy, similar to what is commonly used in hospitals, clinics and other human healthcare facilities.

"Security" is an ongoing process and is implemented through a set of actions and technologies designed to protect facilities, data and other assets. This includes fences, locks, electronic surveillance systems, alarms, and other hardware and software devices. Purdue University's Rural Security Planning booklet (www.btny.purdue.edu/Pubs/PPP/PPP-64.pdf) covers basic security and planning principles, physical security, product storage and categories of personnel threats.

Another source of information on agricultural security rises from the problem of "meth" (methamphetamine) drug labs commonly being located on farms and in remote rural areas. As a result of the growing meth lab problem, several universities, including Ohio State (<http://ohioline.osu.edu/aex-fact/0594-1.html>) and the University of Minnesota (www.bae.umn.edu/ennotes/S/S101-2004-08.html), have produced fact sheets that cover basic farmstead and chemical security.



Online Resources

A new agrosecurity website, [www.agctr.lsu.edu/eden], can help educators, producers and agricultural industry professionals incorporate security into their facilities and business practices. "It's a one-stop clearinghouse of educational information, web pages and agency contacts," says John Shutske, agricultural safety and health specialist with the University of Minnesota Extension Service.

"Many security and terrorism experts consider our agricultural system to be among our country's most vulnerable targets," Shutske adds. "A terrorist's goal could be to instill fear, damage the economy or directly impact the lives and health of people."

The site includes background information (including a history of past incidents affecting agriculture), agrosecurity principles for protecting farms, preparing for an agroterrorism event and an array of other information sources.

Penn State University's Veterinary Science Outreach program maintains a number of educational bulletins, PowerPoint slide presentations and links related to animal biosecurity (<http://vet.extension.psu.edu/Biosecurity/BioMain.html>). The U.S. Poultry and Egg Association has developed a Biosecurity Educational Module, which is available on a CD-ROM at no charge to qualified individuals (www.poultryegg.org/Biosecurity/biosecurity.cfm).

In addition to the resources listed here, most states have resources available through the Department of Homeland Security. Visit (www.usda.gov/homelandsecurity/) for details.

An Agricultural Education Report Card: *Data from Assessment is a Call for Action*

“**W**hen I first saw this information, I went through the whole range of emotions. It made me mad, and I wanted to question the data,” says Jason Larison, who teaches agriculture in Holton, Kan., and was named one of the top 40 educators in America in 2004 by Disney.

What data was it that angered Larison? The data was derived from agriculture student scores from last spring’s *High Schools That Work* assessment. Across the country, schools are being held accountable for student performance. From the No Child Left Behind program to individual state efforts, educators—including agriculture educators—are being asked to document student progress like never before. Much of this effort stems from a push by the business community, which is demanding better performance from workers.

As an academic discipline, agricultural education needs to demonstrate how its programs help students learn and how those programs can be assets to school districts. The 2004 National Association of Agricultural Educators’ Convention in Las Vegas featured a report card of sorts from the *High Schools That Work* program, followed by a panel discussion on the data presented.

Dr. Ann Benson, a consultant to the Southern Region Educational Board (SREB) and project director for the national High School to College and Career Transitions Initiative, launched the discussion by presenting data from the *High Schools That Work* (HSTW) program.

HSTW is a consortium of 32 states, including 1,000 high schools and 200 middle schools from all across the United States. Its goal is improving the quality of high schools with emphasis on raising the

academic achievement of high school students. HSTW is a data-driven organization that seeks to establish an environment of high expectations in participating schools.

Benson Challenges Agriculture Educators

Formerly the Oklahoma Department of Career and Technology Education state director, Benson is a long-time friend of agricultural education and assured the audience her goal was to inform and assist in improving the agricultural education profession. Dr. Benson thanked agricultural educators for their work and challenged the profession to do more.

“Agricultural education has served as not just a model to the career and technical education community, but to education in general,” Benson said. “You have a history of leadership and tradition to build on, but you also have challenges that need to be met.”

Benson presented data from the NAEP test administered in the spring of 2004 to more than 60,000 seniors in 31 states. The test focused on how well students were performing in reading/language arts, math and science. In addition to the academic achievement portion of the test, teachers and students were asked a battery of questions about their educational experiences in high school to indicate their study practices, expectations, the influence of counseling, etc.

Benson indicated high schools are in a period of transition and asked teachers to think about what was happening in their own schools. “How are we doing in helping our students improve their academic skills? What can we in agricultural educa-



Dr. Ann Benson addresses the 2004 NAAE Convention.

tion do to improve the academic achievement of high school students?”

“If we are to preserve opportunities for students to take career and technical courses in their high school schedule, we must know how we are doing and be prepared to make changes to accommodate the challenges,” Benson said.

By the Numbers

Of the 60,000 students who took the NAEP-based test last spring, more than 2,500 indicated they had taken an agriculture concentration. The test results are, in a word, disappointing.

- Only 46 percent of agriculture students met the HSTW reading goal, which was third lowest among CTE students.
- According to the data, 45 percent of agriculture students say they seldom or never placed importance on writing in their agriculture courses.
- Only 53 percent of agriculture students met the HSTW math goal; 40 percent answered “seldom” or “never” when asked if their agriculture classes placed importance on math.
- Only 46 percent of agriculture students met the HSTW science goal. This result is particularly striking because of the underlying science concepts inherent in the agriculture curriculum. For years, agricul-

ture teachers have promoted the idea of students receiving science credit for taking agriculture courses. Yet, this data indicates student proficiency in science is lacking. Benson challenged, "We need to ask ourselves, 'Are we doing all that we can to connect the science curriculum and/or state science standards to what we're teaching?'"

- Of all agriculture students who took the test, 39 percent didn't meet any of the *HSTW* academic goals.
- Only 12 percent of agriculture students reported having intensive science experiences (used science equipment to do classroom activities; worked with one or more students in class on science activities; prepared a written report on a science-based project; read an assigned book or article dealing with science).

Benson said, "I've observed great relationships between agriculture teachers and their academic counterparts, particularly in science in Nebraska, Idaho and Illinois. I'm sure there are others. However, the data shows that our agriculture students are not reaching their potential with regard to academics. Ask yourself, 'What can I do?'"

Work-Based Learning

The results didn't get any easier to digest in the category of work-based learning experiences – an area in which one would expect agriculture students to shine. Of all CTE student groups, agriculture students reported the lowest percentage of intensive work-based learning experiences (48 percent, see graph).

“Use your strengths to build, and use the information presented here as your growth opportunities to better prepare students for the future.”

Benson commented, "This is a distressing bit of information, as agriculture educators have long focused on the importance of the SAE aspects of the agriculture program and membership in the FFA. Are we doing all we can to show that these experiences have something to do with real-world work experiences?"

She continued, "We must link what we teach to what lies ahead in terms of occupations for our students. If not, then those who would say that agricultural education courses are career exploratory will win the battle. The research shows that students perform at higher levels if they see the real-life relevance of instruction."

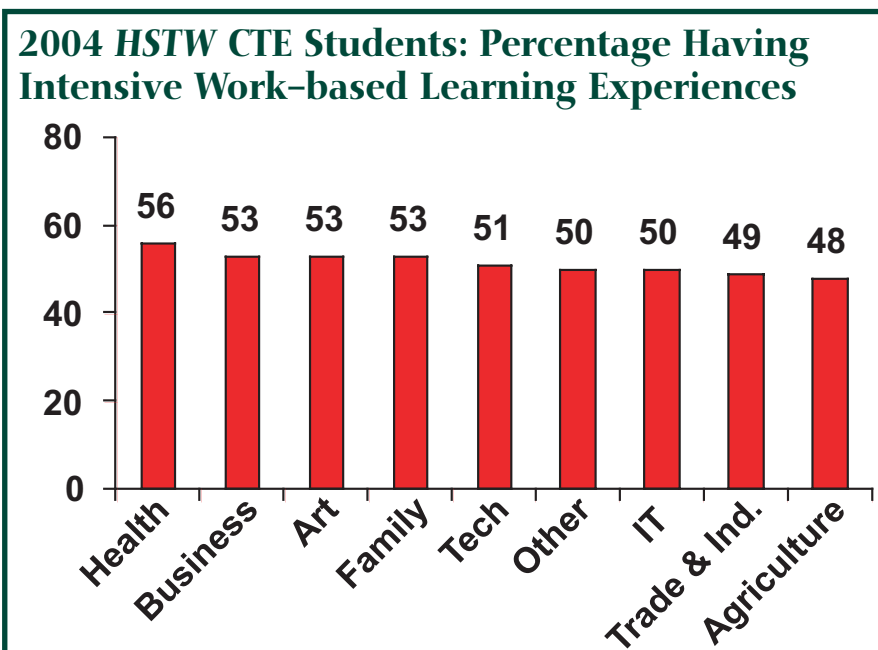
Benson presented further information regarding the need to strengthen students' senior year experience. "The senior year has been a wasted year for huge numbers of our students," she said. "The results show that upwards of 40 percent of all students entering college have to take one or more remedial courses in English or math. The research shows that when college students take even one remedial course, they are 50 percent less likely to ever graduate. We believe that high school juniors should take a developmental exam to determine their college readiness, then use their senior year to become ready. If the test shows they are ready, then early-college courses and other rigorous courses should be provided."

Benson also advocated the Smaller Learning Community (SLC) strategy as a way of increasing high school success and organizing students into career strands. "The many occupations included in the agriculture cluster lend themselves to organization into SLCs."

Build on Strengths

Benson reminded teachers of agricultural education's solid record of achievement in developing leadership skills. "There is a reason agricultural education and FFA have commanded such a high level of respect across the country," she said. "Use your strengths to build, and use the information presented here as your growth opportunities to better prepare students for the future."

"It's up to you to decide what to do with this information," Benson concluded. "You can spend your time refusing to believe that the data is accurate. However, when more than 2,500 students in 31 states answered questions that provide this kind of data, it deserves some of your time to contemplate and discuss. We at *HSTW* stand ready to assist. At the encouragement of Larry Case and Jay Jackman, we will be offering a pre-conference for agriculture teachers, state staff and teacher educators prior to our national staff development conference in Nashville this July. The focus will be on developing



strategies to meet the challenges I've discussed. I encourage you to send a team of teachers from each state to work on strategies that can be brought home to the other teachers of your states and communities."

A Teacher's Response

As one might imagine, agriculture educators found the data presented discomfoting. Jason Larison represented teachers in a panel discussion that followed Benson's remarks.

"When I had processed the fact that, regardless of how you slice it and what arguments we can present against it, the data presented is, to date, the only data available," Larison says. "At that point, my anger frustration turned into sadness for the students being served and our profession in general. The more I thought about it, the more I understood that this is information we as a profession need. We need to process it, discuss it and decide how we can move forward to improve what we do on a daily basis."

Larison compared this experience with one to which many teachers can relate. "I had a group of really sharp students who wanted to compete in the Farm Business Management CDE," Larison recalls. "We had spent a lot of time preparing, so I was fairly confident going in that they would do well. When the results were announced, I was shocked at how poorly these students had performed."

Larison continues, "At first, I rationalized it must have been a bad test. Then, after I had a little time to digest the results and review their scores, I began to realize that it wasn't the test. Merely, the students weren't as prepared as I thought they were. We needed to roll up our sleeves and work harder the next time. Once we knew where we were, we could begin to



Larison shares his thoughts regarding the HSTW data with colleagues at the 2004 NAAE Convention.

improve in our weak areas. This is the same way I see this 'agricultural education report card.' Now that we know where we are, we can get to work and be more prepared for the next assessment."

Making Connections

Larison encourages agriculture educators to apply this thought process to the disappointing data. "We've never been measured like this before," he says. "My school isn't a HSTW school, but as I looked at the data and thought about my students, I really couldn't honestly dispute the results. The data made me think about how I help my students make connections between what I teach and what is being taught in their academic courses."

As an example, Larison cites use of the Pythagorean theorem. "We teach our students how to make sure the trailer or shed or whatever they are building is 'in square,' but do we use the same terminology our math counterparts are using? Do we show them how to make the measurements and then tie that back to the Pythagorean theorem they learned about in their geometry classes? We need to work with our academic counterparts to make sure we're

using the same terminology they are. It is foolish to think students will make the connections if we don't provide the appropriate guidance in our instruction."

More troubling to Larison than the academic scores were the work-based learning data. "I was most alarmed by how students perceived their agriculture coursework and its connection to careers. For years, we have hung our hats on how our programs use SAEs and FFA to provide students with a career connection. Somewhere there is a significant disconnect between what we think we're teaching and what students perceive they are learning. It is clear we need to strengthen the SAE component of our programs."

When Larison contemplates how his students would perform, he isn't satisfied with the results. "I would bet my students would report fairly low numbers as far as rigor and relevance are concerned," he explains. "I speculate they equate 'rigor' with how difficult they perceive a lesson to be. Because they enjoy what they are doing in my courses, I suspect they don't necessarily equate the work with 'rigor,' even though the concepts they are learning are fairly complex."

He continues, "I believe we all need to raise our level of play, so to speak. We need to challenge ourselves and our students to push harder and learn more. This data is a reality check. We need to stop patting ourselves on the back and take time to make sure we're doing the best we can do to serve our students."

National FFA Advisor Dr. Larry Case responds, "Jason is absolutely correct with his assessment. Teachers need to understand that their students' academic performance will be evaluated, and they will be held accountable. The good news is that the data shows teachers who emphasize academic achievement make a difference in the way students score. It is our job at the national level to identify practices that lead to students' academic achievement, then provide teachers with

“
This data is a reality check. I believe we all need to raise our level of play. We need to challenge ourselves and our students to push harder and learn more.
”

the tools and training to implement those practices in their local programs.”

Case continues, “The preliminary thinking includes modifying career development events and degree programs to include academic achievement criteria. This might be a way to provide another way to motivate students.”

Doug Loudenslager, chief operating officer of the National FFA Organization, encourages teachers to return to agricultural education’s core values. “In my travels across the country, agriculture teachers, school administrators, teacher educators and state staff have shared similar concerns providing anecdotal evidence that the three-circle model of classroom, SAE and FFA are not considered critical for all agriculture students. We tend to expect and encourage FFA membership and strong SAEs for only those students who have the potential to win a CDE or a state or national FFA award. That is really unfortunate.”

“
The good news is that the data shows teachers who emphasize academic achievement make a difference in the way students score.
”

Addressing the Accountability Issue

At the national level, Team Ag Ed is united in its approach to addressing accountability issues. The National Association of Agricultural Educators (NAAE) is taking the lead and encouraging teachers to participate in an upcoming HSTW pre-conference.

Dr. Jay Jackman, NAAE executive director, says, “Dr. Benson’s presentation was quite thought-provoking and her message

quite clear. Agricultural education must take a serious look within to determine how we can best deliver our education programs to accomplish our goals of career preparation and academic success through classroom/laboratory instruction, work-based learning (via SAE), and leadership development (via FFA).”

Professional Development Opportunity

Jackman continues, “We have a tremendous opportunity to participate in an agricultural education pre-conference that will convene July 12-13, just prior to the *High Schools That Work* Staff Development Conference in Nashville, Tenn. It is the planning committee’s desire that many, many agricultural educators will attend this event. We encourage teams of educators (state Team Ag Ed groups and/or teams of local school educators—agriculture teachers, academic teachers, counselors and administrators) to attend the pre-conference. This pre-conference has the potential to be a major milestone in school-based agricultural education.”

The pre-conference will focus on reviewing the relevant data regarding how agriculture students perform academically, identifying and developing

strategies for improving the reading, writing, mathematics and science competencies of agriculture students and raising the achievement level by producing challenging assignments and relevant, project-based learning activities. The agenda is designed so that participants will leave the workshop with the tools needed to work with other agriculture educators in their states to improve students’ academic and career proficiency.

Moving Forward

“An evolution has occurred in our profession,” Loudenslager observes. “First known as ‘vocational agriculture programs,’ our terminology changed to ‘agricultural education programs’ in the late 1980s. Maybe this data and similar reports are a call for action and another change.”

Loudenslager continues, “Perhaps it is time for us to begin speaking in the language of academics and refer to our programs as ‘agricultural science.’ As a first step, maybe it is time to build partnerships with our colleagues who teach math, science and English, and identify academic applications in our agricultural science classes, as well as agriculture applications in the recognized academic courses. You can learn more about how to make that happen at the upcoming HSTW pre-conference.”



Doug Loudenslager discusses the issues at the National Agricultural Education Inservice meeting.

An invitation to the pre-conference from Dr. Gene Bottoms, SREB senior vice president, along with additional details, may be found at [\[www.naae.org/links/workshops/index.html\]](http://www.naae.org/links/workshops/index.html). The PowerPoint document Dr. Benson presented at the NAAE convention and a brief biography may be accessed at [\[www.naae.org/links/news/items/\]](http://www.naae.org/links/news/items/). For more information on the Southern Region Educational Board and *High Schools That Work*, visit www.sreb.org.

 Professional Growth

Agriscience Attracts Students

Iike swallows to nearby San Juan Capistrano, students flock to the Mission Viejo Agriscience Academy in California. Kimberley Miller, the lead instructor, credits it to a revitalized agriscience curriculum and a great facility.

Miller, who was named the 2004 Agriscience Teacher of the Year at the 77th National FFA Convention in Louisville, Ky., also deserves a slice of the credit. When Miller arrived at the Mission Viejo High School (MVHS) campus four years ago, she found a dilapidated program and an out-of-date curriculum.

Rebuilding the Curriculum

"I met with my district curriculum development committee and discussed implementing agriscience classes and pursuing science credits that would meet graduation requirements," Miller says. "With the increasing demand for accountability through testing and increasing college entrance requirements, I felt the program needed a new curriculum. I developed a curriculum based on meeting the combined state science and agriculture standards. The result was an

approved four-year Agriscience Academy and the Agriscience Exchange Program."

Students in the academy are offered a four-year course of study that includes agriscience, agriculture biology, veterinary medicine, floral design and agriculture economics. All the courses are considered college preparatory, and all but the beginning agriscience course receive college-level credit through the University of California and California State University systems. In addition, students who complete all four years receive a special seal on their diplomas, identifying them as Agriscience Academy completers.

The exchange program, which is exclusive to the Mission Viejo campus, provides science, math and architectural design students from the main campus with opportunities to participate in lab activities at the school farm. In exchange, agriscience students can use labs on the main campus.

"These exchanges have been very beneficial," Miller says. "The students learned about acreage, slope, square footage and other concepts, then put that knowledge to work by creating blueprints for improvements at the facility. This academic integration led to students designing and building a new shade house."

Build it and They Will Come

Miller spent her first year at MVHS combating a negative image of the agriculture program and rebuilding the curriculum. In four years, the program has grown from 84 students to 254, with a second teacher added a year ago to help manage the growth.

"We implement recruitment activities, but they are of secondary importance to our students word-of-mouth messages," Miller says. "Our students enjoy the hands-on learning and the fact that we teach in an applied manner. For example, in agriculture biology they get to see firsthand how the knowledge they are learning is applied in the real world. We take soil samples and run tests. They plant clover seeds near a creek to recover nitrogen and reduce water pollution at nearby Doheny Beach."

Miller continues, "The farm serves as our living laboratory, and they love it. The agriscience facility is located off the edge of the main campus, and I've had students come up and say things like, 'I love it down here. This is my world.' They take a personal interest in the facility and take responsibility for taking good care of it."

Teacher Impact

Beyond the curriculum and the facilities, parents and administrators indicate Miller is the key reason the program is successful. "Kimberley has an innate ability to identify the unique traits of each student and address their needs accordingly," says Marti Mackenzie, a parent volunteer. "She embraces each child with the idea that he or she is a key member of the MVHS student body. As a dedicated advocate for her students, Kimberley encourages each student to strive for their personal best. It is the individual attention given to her students that generates interest in the program. She is a mentor that makes a difference."





Marilyn McDowell, MVHS principal, adds, "Mrs. Miller has greatly enhanced our science offerings and has a waiting list of students who want to be in her program. Her lessons are hands-on and produce incredible results for her students. As a result, we have students who find their niche in high school. They learn responsibility and are afforded leadership training and opportunities they would not get in other science classes. Our science curriculum is expanded and enriched with new course offerings and alternatives to the traditional college prep coursework."

McDowell continues, "Because of the agriculture program, this school provides unique opportunities for its students that aren't available anywhere else. In the community, we preserve and honor the agricultural history of the area. Parents bring their students to this school specifically to participate in the agriculture program. Ag makes our school unique and adds character to the campus, while enriching the lives and futures of our students. Mrs. Miller's work ethic, creativity, professionalism and ability to reach students are exemplary."

Engaging Students

In addition to an increasing number of FFA members, Miller reports more students are active in the chapter. "Students are genuinely excited about their SAE programs, and many want projects that

revolve around agriscience. Our greenhouse is full of orchid projects that are grown through the use of hydroponics. I am seeing students develop new objectives for their futures based on their interests in agriscience. We have a number of students working toward careers in agriscience and medicine – both human and animal. These students are discovering early on how a career choice can make their lives successful and fulfilling."

Beyond SAE participation, Miller's students have also increased their participation in career development events, including creed speaking, public speaking, parliamentary procedure and job interview categories. "Most students who participate in the speaking contests choose agriscience topics, as they are very comfortable with the subject matter," she explains.

The most successful chapter activity is the annual agriscience fair. "Students in all classes compete and conduct presentations to administrators and teachers, who we invite to judge the event," Miller says.

"We have a special awards ceremony during our annual banquet for chapter, region and state-level participants."

"Agriscience is such a cool thing – such a 'now' thing," she continues. "It opens up so many opportunities for students. When you start gaining recognition for your program, resources will make themselves available. Since winning this award, I've had administrators ask what they can do to help. Parents, too. Receiving professional recognition validates what we do and how we teach our students."

Miller encourages teachers to apply for professional awards, including the Agriscience Teacher of the Year Award. "Many teachers shy away from applying for awards, but it's what we ask our students to do all the time. We need to set a good example for them," she says. "My philosophy is that the more positive attention I can garner for the program, the stronger it will become and the more resources will be made available."

The Agriscience Teacher of the Year program is sponsored by the PotashCorp as a special project of the National FFA Foundation. For more information on this program, visit www.ffa.org/programs/ag_sci/index.html#teacher or call 317-802-4402.

You Can't Win if You Don't Enter

Teachers are often reluctant to complete award applications for themselves. In fact, their aversion to drawing attention to themselves can create challenges for programs designed to recognize outstanding educators. Such is the case with a number of National FFA Organization awards, including the Agriscience Teacher of the Year award.

Why Apply?

As 2004 Agriscience Teacher of the Year Kimberley Miller acknowledges, too often teachers fail to fully embrace the professional and academic value of applying for awards. The opportunities awards open for students, the partnerships they create for schools, and the recognition they generate for programs are tremendous wins teachers often seek to generate. Applying for this award is an easy step on the path to generating those opportunities, partnerships and recognitions.

Details

In the Agriscience Teacher of the Year program, every state winner receives \$100, and the national finalists each receive a \$500 cash award and a \$1,500 grant for their school to purchase agriscience equipment. The application form, selection criteria and other details can be found online at www.ffa.org/programs/ag_sci/index.html#teacher. For more information, please send an e-mail message to agriscience@ffa.org or call 317-802-4402.

Why Do Leaves Change Color in the Fall?

All leaves carry pigment for all colors to which they may change throughout the year. The predominant color, appropriate for the season, is the one we see, and the others are masked. The following lab activity will help students understand this natural phenomenon.

Background

Chlorophyll is the pigment that gives leaves their green color. In the fall, when days become shorter and temperatures lower, chlorophyll breaks down and is no longer produced in the leaf. This is when the other pigments, carotenoids (responsible for orange and red) and xanthophylls (responsible for yellow) become visible.

Activity Description

In this activity, students will separate pigments found in a leaf through a process called chromatography. This method utilizes a solution containing leaf pigments from leaves ground up in alcohol and shows them traveling up filter paper and separating. The smaller, or less abundant pigments travel higher.

Materials Needed

- Test tubes – 3 per lab group
- Test tube racks
- Coffee filters
- Scissors
- Green leaf extract
- Colored leaf extract
- Pipettes
- Acetone (fingernail polish remover)
- Graduated cylinder

Preparation

Green leaf extract is made by chopping or grinding fresh green leaves with rubbing alcohol. Add a little alcohol when you first begin to chop or grind, then a little more. The richer the color of green in the alcohol the better. Adding too much alcohol will lighten the pigment mixture too much. Colored leaf extract is the same way, only you will need to start with leaves that have changed to orange, yellow or red.



Procedure

1. Trim two test strips from the filter paper to dimensions of 20 cm long by 12 mm wide. Your test strips must be long enough to stick out of the test tube.
2. Cut two small, v-shaped notches out of either side of the test strips about 2 cm from one end.
3. On one test strip, place a dot of green leaf extract just above the notches. It is best if you add several dots to the same spot to ensure enough pigment has been applied.
4. Let the pigment dry on the filter paper for about one minute.
5. Repeat steps three and four using the colored leaf extract on the other test strip.
6. Pour 5 ml of acetone into each test tube.
7. Hang one piece of filter paper inside each of the test tubes to that only the end of the test strip below the notch is in the acetone.
8. Place the test tubes in the test tube rack for about 15 minutes and observe the reaction. Record observations every three minutes.
9. At the end of 15 minutes, remove the filter papers from the test tubes.
10. Tape each test strip on to the back of your lab sheet and label:
 - Which extract was applied from the start on each?
 - What colors can be identified?

Results

From the green extract, the students should see green at the bottom of the filter paper, then yellow, orange, red and brown colors moving up the test strip. From the colored extract, students should see brown, then red, orange, yellow and lastly, green.

Agriscience Lesson Plan 2

Clover Bumps

Legume plants work symbiotically with bacteria to absorb nitrogen from the air and water and “fix” it in the soil for use by plants. This lab activity will help students understand nitrogen fixation and how legumes may be used to clean areas where excess nitrogen is located. After performing this activity, students will understand how bacteria help clovers live, and how clovers can help clean water sources.

Materials Needed

- Trowel
- Clover plant
- Clover seeds
- 1 quart (1 liter) plastic bucket
- tap water
- paper towels
- Magnifying lens
- Microscope
- Water test kit (for nitrogen)

Procedure

1. Dig up a clump of clover from a field or lawn, obtaining as much of the root system as possible.
2. Fill your bucket with water and dip the root system in the water enough that all soil is removed.
3. Use the paper towels to blot the plant dry.
4. Observe the plant, especially the root system. You should observe little bumps or nodules on the plant’s root system. Take a digital photo of the plant for your future comparisons.

Discussion

Why are there bumps on the root system?

As you already know, plants need nitrogen compounds found in soil. Seventy-eight percent of the Earth’s atmosphere is nitrogen gas, but plants cannot utilize nitrogen in gas form. Nitrogen-fixing bacteria changes the nitrogen gas

into nitrogen compounds plants can use. The nodules on the roots of a clover plant represent one way that this bacteria lives with a plant. This is a symbiotic situation for the clover plant and the bacteria. The bacteria “fixes” nitrogen gas so that the plant can use it, and the plant provides food for the bacteria.

Procedure, continued

1. Plant clover seeds or clover plants near a creek or stream. Use the clover plant you originally dug up, and mark which one it is.
2. Take a water sample from the stream or creek and evaluate the amount of nitrogen in that sample. Record this information
3. Plant the clover as close to the stream as possible, but just away from the bank so that the clover is not in water all the time. Let the clover grow.
4. Take water samples just downstream from the clover patch that will begin to grow every week and compare it to your original reading. Over time, you will see a marked decrease in the amount of nitrogen that will run along the same side of the stream as the clover patch. The bigger the clover patch, the bigger the difference in nitrogen levels.
5. Continue evaluating for about eight weeks.
6. After eight weeks, dig up a few clover plants. Follow instructions for evaluating the bacteria nodes above. Are the new nodes bigger than the original plant nodes you photographed?
7. For further investigation, cut the node open and evaluate them under a microscope or with a magnifying glass.



Agriscience Students Earn Scholarships, Accolades

One of the best ways to highlight the value of agricultural education programs is through showcasing student achievement. Frequently, that means through FFA and its award programs.

However, the positive message can be amplified when it is sent through recognized academic channels. A recent achievement by two students from the Minneapolis-based Agriculture and Food Science Academy delivered the message most eloquently to science teachers, parents and administrators.

Last fall, Hannah Von der Hoff and Elizabeth Argo of Minneapolis each received a \$1,000 scholarship and a bronze medal for their research project at the prestigious Siemens Westinghouse Competition in Math, Science and Technology. They attend the Agricultural and Food Sciences Academy in Little Canada, Minn., which also received \$2,000 from the foundation. Their research project looked for evidence of genetic drift in organic soybeans.

For their research project, Von der Hoff and Argo set out to find evidence of genetic drift in organic soybeans. Genetic drift, which causes contamination of organic and conventionally grown soybeans, occurs when wind, insects or birds carry pollen from genetically modified soybeans. In addition to the negative effect of genetic drift on crops, organic soybean producers suffer major profit losses because they may no longer charge a premium price for their product.

Since undertaking their project, the team has worked to inform organic soybean producers in their home state about the danger and the need to take precautionary steps. Their research can also play a role in alerting manufacturers of genet-

ically engineered crops. Carl Aakre, their high school advisor and biotechnology administrator, was their mentor.

Siemens Westinghouse Competition

The Siemens Westinghouse Competition in Math, Science and Technology recognizes remarkable talent early on, fostering individual growth for high school students who are willing to challenge themselves through science research. Through this competition, students have an opportunity to achieve national recognition for science research projects that they complete in high school. It is administered by The College Board and funded by the Siemens Foundation.

Students may submit research reports either individually or in teams of two or three members. Impartial panels of research scientists from leading universities and national laboratories judge the reports in the initial blind reading.

Students whose projects are selected for further competition are invited to give an oral and poster presentation at one of the six regional events hosted by partner universities. At each of these regional competitions, an individual and a team are selected as regional winners. These students receive scholarships of \$1,000 each as a regional finalist (including team members) and \$3,000 each as an individual regional winner. The winning team will receive \$6,000 to be divided among team members. Regional winners then receive an invitation to advance to the national competition in New York City.

In the national competition, students' presentations are judged by research scientists recruited for their specific expertise in the area of research for each project. The top individual and team winners



Argo and Von der Hoff with their display at the National Agriscience Fair.

receive additional scholarships of \$100,000. Runners-up receive scholarships ranging from \$10,000 to \$50,000.

Encourage Participation

Often educators think that high-level research competitions such as the Siemens Westinghouse program are beyond the reach of their students and limited district resources. But you only need one student and your own initiative to get started.

If you have students with a strong interest in agriscience, encourage them to consider participating in this competition. Registration for the 2005-06 competition opened May 3, and the deadline for entries is October 3. More information about the 2005 program, along with information for educators and students, may be found at [www.siemens-foundation.org/]. For more details about Von der Hoff and Argo's work, including a one-page summary of their work, visit [www.siemens-foundation.org/2004/Notre%20Dame/Hoff-Argo].

About the Siemens Foundation

The Siemens Foundation provides more than \$1 million in college scholarships and awards each year for talented high school students in the United States. Its signature programs reward exceptional achievement in science, math and technology. By supporting outstanding students today and recognizing the teachers and schools that inspire their excellence, the foundation helps nurture tomorrow's scientists and engineers.

Getting a Grasp on Global Issues

the news is filled with stories from around the world that can cause fundamental shifts in our economy and our society. Instability in the Middle East impacts energy costs. Animal diseases in faraway lands impact how we must manage animal health—and public perception—here at home. As global trade increases, so does our need for understanding global issues and interactions.

So, how do agriculture teachers increase their awareness of global issues and incorporate them into their programs? It starts with cultivating an awareness of the issues and grows in many different ways. One of those ways is to dive in headfirst and participate in international experiences.



Folan works with horticulture students at Florin High School.

Building a Network

Sheila Folan did just that and enjoyed a “trip of a lifetime” in 2001. Four years ago, Folan participated in the Toyota International Teacher Program (TITP), through which 50 U.S. high school teachers benefit from two weeks of rigorous travel throughout Japan. This unique cultural/educational study tour focuses on Japan’s past and present and explores issues shared by all industrialized countries.

“The Toyota program was a tremendous experience,” Folan says. “Spending two weeks traveling through Japan with

teachers from across the country was incredible. It opened up a world of opportunities for me and my students because of the network it helped create.”

Serving Students

Folan, who teaches horticulture at Florin High School in a Sacramento, Calif., suburb, infused the experience into her courses. “I am able to share social and cultural information in the context of horticulture,” she says. “The experience and the information garnered have provided a springboard for me to network with teachers from across the country and, literally, around the world.”

The Florin High School student body is very diverse ethnically and socio-economically, with a high population of English-language learners. Folan’s hands-on approach to science through horticulture provides many students with a path to success academically.

“Our students are literally children of the world,” Folan explains. “We have students from Mexico, Central America, Southeast Asia and Eastern Europe who speak 31 different languages. Because of our hands-on approach, student achievement is quite high in our program. It helps to have visited another country and be able to understand some of the cultural dynamics at work.”

Reaching Out

When Folan received a message earlier this year announcing the opportunity to travel to Japan again, she didn’t hesitate. “When I saw the Expo 2005 announcement asking for teachers to lead a group of students, I jumped at it. I couldn’t think of a more worthwhile way to invest my time this summer than to help students learn through an international experience.”

Folan has been selected to help lead this summer’s Toyota Youth Program at EXPO 2005 to Aichi, Japan. Among the students participating are three FFA members who were selected based on their

achievements in the 2004 National FFA Agriscience Fair. Robert Bialozynski of Pulaski, Wis.; Abby Ongley of Greenwood, Pa.; and Courtney Timmons of Byng, Okla., will participate in the 10-day program organized and administered by the Institute of International Education. For more details on this program, visit [\[www.iae.org/programs/type1\]](http://www.iae.org/programs/type1).

Rhonda Glasscock, corporate contributions manager for Toyota Motor Sales, U.S.A., Inc., says, “Toyota highly values education, teachers and the critically important part they play in developing tomorrow’s leaders. We are extremely pleased that each year several agricultural science teachers are selected to participate in the Toyota International Teacher Program. Toyota recognizes that educators are not only great ambassadors abroad, but also great ambassadors in their classrooms for international awareness.”

Opportunities

Each year, a number of different organizations provides opportunities for teachers to travel and study abroad. These include Earthwatch Institute expeditions [www.earthwatch.org/], USDA’s TEACH program [www.fas.usda.gov/admin/teach/teach.html], and the Toyota International Teacher Program [www.toyota.com/about/community/education/doors.html].

Folan encourages teachers to apply for international experience programs. “These programs are an excellent introduction to the world of international travel and education,” she says.

The TITP is open to educators in Washington, D.C., and the nine states where Toyota operates major manufacturing, design and research facilities: Alabama, California, Indiana, Kentucky, Michigan, Missouri, New York, Texas and West Virginia. Applications for the June 2006 program will be available in September. For more information, visit [www.iae.org/pgms/toyota] or e-mail [toyotateach@iae.org].

LPS Staff

Tony Small

Team Leader
Office: 317-802-4300
Cell: 317-709-0298
tsmall@ffa.org

Seth Derner

Specialist, Northwest Region
Office: 317-802-4413
Cell: 317-902-8596
sderner@ffa.org

Kevin Keith

Specialist, Northeast Region
Office: 317-802-4254
Cell: 317-709-0806
kkeith@ffa.org

Ernie Gill

Specialist, Southwest Region
Office: 317-802-4222
Cell: 317-294-8410
egill@ffa.org

Larry Gossen

Specialist, Central Region
Office: 317-802-4352
Cell: 785-230-0899
lgossen@ffa.org

Jeff Papke

Specialist, Southeast Region
Office: 317-802-4350
Cell: 317-294-0896
jpapke@ffa.org

Michele Gilbert

Program Coordinator
Office: 317-802-4301
mgilbert@ffa.org

Collegiate Services

Eric Schilling

Collegiate Specialist/PAS
Executive Director
Office: 317-802-4214
Cell: 402-202-6083
eschilling@ffa.org

Jill Casten

Program Manager
Office: 317-802-4356
jcasten@ffa.org

Kristy Miller

Program Coordinator,
PAS/Collegiate
Office: 317-802-4220
kmiller@ffa.org

Local Program Success

Biotechnology and Agricultural Education

throughout the history of agricultural education, teachers have worked to stay on top of new technologies and changes in the industry, even though change comes faster and faster, and the technologies become more and more advanced as time progresses.

One such area of change in agriculture and related industries has been biotechnology. Biotechnology has been controversial in its applications and ethics. It requires high-level science skills in its workers; it also requires tremendous accuracy and has almost infinite potential.

Serving Student Needs

While some agriculture educators have grasped the broad potential for instruction in biotechnology and sought ways to integrate instruction in and about biotechnology into their curricula, the somewhat challenging characteristics of biotechnology and the biotechnology boom have, on occasion, caused agriculture instructors, departments and school districts to shy away from this area of instruction.

Instruction about biotechnology presented in an inclusive and non-judgmental way should be a part of every agricultural

education curriculum in our country. We provide no service by not equipping our students with the basic information needed for them to make informed decisions when it comes to biotechnology.

Far too much harm has been done over the recent developmental years of biotechnology (and its research and resulting businesses) due to lack of information and use of scare tactics. If students are unaware of basic information about the processes used in biotechnology and the laws and ethical rules for research and development, they may make ill-informed decisions that can impact their long-term quality of life.

It is impressive to visit agricultural education programs across the country and see the efforts being made to acquaint students with biotechnology. Such activities as DNA extraction and gel electrophoresis and the background sciences needed for comprehension will also elevate the agricultural education profession as a major delivery conduit for science competencies so important in today's high-stakes testing atmosphere. This alone may be the more important impetus for integrating biotechnology into the agricultural education curriculum.

Some teachers have relayed to me that they have been including instruction on everything from awareness, communications and ethics of biotechnology to actual laboratory tissue culture and development of patented organ-



By *Kevin Keith*
LPS Specialist
National FFA Organization

isms for the past 15+ years. Also notable is the number of states offering professional development workshops in the areas of biotechnology, as well as the number of resources offered on the broad subject of biotechnology and its many parts. The National FFA Organization commends those who have accepted the challenge to integrate biotechnology into their classrooms and challenges those who have not yet implemented such instruction to do so.

Resources Available

There have been a large number of resources identified through this publication over the past years, and we will continue to bring these to your attention. Do not hesitate to contact universities, colleges, research institutions, educational resource vendors and your national Team Ag Ed organizations and staff as you encounter needs in your efforts to include this important subject matter in your local curriculum. Continue to use communications such as *FFA Advisors Making A Difference* to stay on top of available resources that may support your endeavors in this area.



Local Program Success is a national initiative designed to enhance the quality and success of local agricultural education programs. LPS uses the total program concept of Instruction, SAE and FFA and four strategies (Program Planning, Marketing, Partnerships and Professional Growth) to assist local teachers in facilitating successful local programs that meet the needs of students and the com-

Knowledge Key to Alumni Advocacy

as an FFA advisor, I have asked FFA Alumni members to actively participate in advocating for national issues such as the Carl Perkins Act reauthorization. Although this piece of legislation is crucial, what is even more important is the advocacy that occurs in the local community.

Many advisors feel that it is their sole responsibility to advocate or promote the agricultural education program. However, it is unrealistic to think that one individual can do it alone. Advisors must use all the resources at their disposal. One of the most effective resources they have is the local FFA Alumni members.

As an agriculture educator, I know firsthand how effective alumni members can be as advocates for agricultural education and FFA. Their active involvement with the program gives them a unique knowledge of its tangible benefits for today's youth. They are able to share that knowledge with key stakeholders in the community, like agribusiness owners, community leaders, parents, school administrators and policy makers.

They are also able to share firsthand knowledge of the program's needs. Because they have already established community relationships with key stakeholders, they can have a greater influence in persuading others to support the local agricultural education program financially and otherwise.



By Ron Nash,
Agriculture Teacher
Zillah High School
Zillah, Washington

For assistance and information on working with FFA Alumni affiliates, contact the National FFA Alumni Association at 317-802-4294 or send an e-mail to fsal-dana@ffa.org.



ffa

new horizons



THE MAGAZINE OF THE NATIONAL FFA ORGANIZATION

I N T H E C L A S S R O O M

June
Issue

As a way to help teachers use *FFA New Horizons* as a teaching tool, you'll begin seeing this box in *FFA Advisors Making a Difference*. In this space, FFA staff will identify key articles in the upcoming issue of *FFA New Horizons* and suggest strategies on how to use the articles in your classroom!

Page 18

FFA member C.C. DuBois

Promising Practice:

- Encourage students to apply for proficiency awards in the areas of their interests. This will help them develop their SAEs and learn valuable record keeping skills.

Web Connection:

- Visit [www.ffa.org/programs/proficiency/index.html] for information about the Agricultural Proficiency Award Program.

Page 19

National FFA Officers in Japan

Promising Practice:

- Have students explore agriculture in different countries. They can research the most profitable crops, what the best months are for growing and many other agriculture-related topics.

Web Connection:

- Students can read more about the National FFA Officers' adventures in their online journals at [www.ffa.org/students/html/nationalofficers.htm].

Page 24

The College Factor

Promising Practice:

- Have each student choose and research a career in agriculture. Encourage them to interview college students pursuing a career in that field to find out more information about salaries, education requirements, etc.

Web Connection:

- Visit [www.ffa.org/collegiate.cfm?method=c_job.CareerSearch] to search an extensive agricultural career database.

Opening Doors of Opportunity

Burbank High School, located in San Antonio's inner city, is home to a thriving agricultural education program and a budding effort to increase diversity in FFA membership.

One of the nine key strategic priority areas for the National FFA Organization is to improve the organization's performance as a diverse organization. In our multicultural society, the success of agriculture and agricultural education will be greatly enhanced as it attracts and engages student groups that have traditionally been underrepresented.

FFA's goal is simple. However, the challenges are significant. So, too, are the opportunities. With financial assistance from Toyota and leadership from Texas A&M University, FFA is pilot-testing a program in San Antonio designed to enhance Hispanic FFA membership.

Specifically, the program goals are to:

- increase student diversity in the targeted agricultural education programs
- increase the number of diverse students who participate in state and national FFA events
- increase the number of diverse students who apply for FFA degrees, awards and leadership positions
- increase the diversity of students enrolling in agricultural education at the university level

"This project has created a lot of interest," says Paul Jaure, the FFA project coordinator. "We're working with three high schools, all of which have 90 percent or greater Hispanic representation in their student populations. We've uncovered a number of challenges and progress is slow, but we're starting to see some success."

Opening Eyes, Minds

"Most of our students come from low socio-economic backgrounds, and they've

never had the chance to attend a state or national FFA convention," says Gerald Silva, the agriculture instructor at Burbank High School, which is one of the participating schools. "Most of our students haven't been outside of Texas, let alone been on an airplane."

An 18-year veteran of the classroom, Silva had never had the opportunity to attend a national FFA convention until last fall. As part of the diversity initiative, Silva, along with two students, a school board member and an assistant superintendent, traveled to Louisville for the convention. "It was a terrific experience and really opened my students' and board members' eyes to what FFA and agriculture have to offer," Silva explains.

The group returned to Burbank revved up and ready to make changes. "The students did a great job of telling others about their experience," Silva says. "Our membership is up 50 percent this year and continues to climb."

A Series of Firsts

Another first happened a few weeks ago when the chapter hosted an FFA leadership camp. Three FFA Made For Excellence counselors presented a specially tailored leadership program and made a big impression. "The counselors did a great job of relating to the students," Silva says. "The kids began to see the opportunities and understand all the benefits FFA offers. The training focused on helping them understand themselves and set goals. You could see a difference in their outlooks almost instantly. It showed them they really are important and that they can be successful."

The chapter also recently hosted its first parent-member banquet in 12 years. "We are constantly fighting a stereotype in agricultural education," Silva says. "Many Hispanic parents were migrant workers, and they don't want their kids to be farmers. Once they see the opportunities, their

attitudes change. When they see scholarships and job opportunities in business and science, it really opens their eyes, and they begin to understand what our program is about. After the banquet, I had parents coming up to me and offering their assistance. They'd say things like, 'Whatever you need, just give us a call.' It was extremely gratifying."



Two Burbank students enjoy a tour during their national convention experience.

Increasing Visibility

Dr. Roxanne Rosales is the San Antonio School District's career and technical education director. She feels the pilot program is helping in many ways. "One of the things that has happened is that our agriculture program has become more visible," she says. "Our core academic teachers have a greater awareness of what Mr. Silva is teaching and how what he does supports their content. The core teachers are beginning to understand the value of the hands-on activities used in the agriculture program."

While there are still many obstacles to overcome, Silva and his students have proven that, with a little training and support, attracting diverse populations to agricultural education and FFA is not an insurmountable obstacle.



TeacherResources

National Food and Energy Council Resources

The National Food and Energy Council's role as a non-profit association is to promote the safe use of electricity in rural and agricultural applications. The resources listed below are designed to help agriculture instructors teach basic electricity safety and proper electrical wiring. Here are some of the teaching aids available:

- Agricultural Wiring Handbook (13th edition; 100 pages, discounted price for teachers)
- Farm Safely With Electricity (pamphlet with several illustrations to highlight electrical hazards on the farm, teacher discounts)
- Sizing and Selecting Your Standby Generator (great for adults and students, understand how to select a standby generator for farm or home)
- Safe Electrical Wiring CD (interactive CD; color screen graphics; students "connect" basic circuits in barns and buildings)

To learn about other classroom resources available or to order, visit [\[www.nfec.org/material_to_order/mattoorder.htm\]](http://www.nfec.org/material_to_order/mattoorder.htm).

State Leaders Conference

The National FFA Alumni Association invites all alumni members and their families to attend the 2005 State Leaders Conference July 26-31, in Columbus, Ohio. State Leaders Conference (SLC) is an opportunity for FFA Alumni leaders across the country to meet and discuss the issues facing FFA and FFA Alumni. It is a time to gather valuable information and resources from workshops presented around the theme, "Advocates for Agricultural Education." Various tours and social engagements are the final touch in creating an environment for learning, friendship, relaxation and fun. For additional conference information and a registration form, visit [\[www.ffa.org/alumni/\]](http://www.ffa.org/alumni/) or call

317-802-4293. Please note: Each state is entitled to one SLC grant to cover the conference fee for their official state representative. Contact your state FFA Alumni leaders about the possibility of attending the conference as your state's representative.

Learn More About Agricultural Education Resources

The National FFA Organization wants to ensure teachers and pre-service teachers are equipped to do their jobs effectively and efficiently, which means getting you the resources that you need. Contact FFA if you have a conference, seminar, enrichment activity, meeting or class coming up where you would like to have products from The Core featured. FFA staff will set up displays, present workshops on effectively using any of the products and answer all of your questions! To schedule an event, e-mail [\[coreadvice@ffa.org\]](mailto:coreadvice@ffa.org) or call 317-802-4239. The summer schedule is filling up quickly, so don't wait to schedule your event!

Grant Writing Resources

Many educators have found that grants allow them to provide their students with educational experiences and materials their own districts can't afford. Learn how they get those grants—and how you can get one, too. Included are practical tips to help first-time grant writers get the grants they need. For details, visit [\[www.educationworld.com/a_curr/profdev/profdev039.shtml\]](http://www.educationworld.com/a_curr/profdev/profdev039.shtml).

Student Day of Education

On July 28, the National Cattlemen's Beef Association (NCBA) and American National Cattlewomen, Inc. (ANCW) will host Student Day of Education - Knowledge and Practical Advice for a Successful Career. It will be held as part of the Cattle Industry Summer

Conference at the Adam's Mark Hotel in downtown Denver, July 26-30. This is a great opportunity to advance your career and to learn more about current issues in agriculture. Visit [\[www.beefusa.org\]](http://www.beefusa.org) for the registration forms. If you are interested in attending, please e-mail [\[mhervey@beef.org\]](mailto:mhervey@beef.org) or call 303-694-0305.

Open Call For Agricultural Education Ed.D.

Are you an agriculture educator? Would you like to enhance your capabilities and increase your marketability? Would you like to make more money? If you answered "yes" to any of these questions, then consider applying for admission to the Doc @ Distance program.

Doc @ Distance is a cohort program offered by Texas Tech University and Texas A&M University that culminates in a joint Doctor of Education degree in agricultural education. The best part is your ability to take classes wherever you are, without putting your life on hold.

The commitment is a serious one, but if you want to move ahead in the world of agricultural education, then discover how Doc @ Distance can work for you. Applications will be accepted beginning September 1, 2005. Visit [\[http://docatadistance.tamu.edu\]](http://docatadistance.tamu.edu) for more information.

Biodiversity Information

"Biodiversity" provides resources for learning about genetic, species and ecosystem diversity. Explore databases on amphibians, birds, corals, fish, fires, invasive species, plants, oceans, watersheds and wetlands. Examine genetic information on flies, worms, mice and trees. All this may be found at [\[www.nbj.gov/issues/biodiversity/\]](http://www.nbj.gov/issues/biodiversity/).



Washington Leadership Conference

2005

Changing the World

Serving Your Community

Building Relationships

Will You Be There?

Registration begins March 2005!

For More Information Visit Our Website at www.ffa.org



The FFA Mission: FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education. **The Agricultural Education Mission:** Agricultural Education prepares students for successful careers and a lifetime of informed choices in the global agriculture, food, fiber and natural resources systems. The National FFA Organization is a resource and support organization that does not select, control or supervise state association, local chapter or individual member activities except as expressly provided for in the National FFA Organization Constitution and Bylaws. The National FFA Organization affirms its belief in the value of all human beings and seeks diversity in its membership, leadership and staff as an equal opportunity employer.

Our 2005
Conference Dates

- June 7-12
- June 14-19
- June 21-26
- June 28-July 3
- July 12-17
- July 19-24



Washington Leadership Conference

The dates for the 2005 Washington Leadership Conference are June 7-12, June 14-19, June 21-26, June 28-July 3, July 12-17 and July 19-24. The costs are as follows: student package: \$550; advisor double: \$585; advisor single: \$780; advisor guest: \$975; room only: \$475. This year's conference will feature high levels of service learning, mentoring and volunteerism strategies, problem-solving skills, relationship-building skills and character development. This premier leadership conference is shaping up to be the best yet! For more information and to download a registration form, visit www.ffa.org/programs/conferences/html/conf_wlc.htm, e-mail wlc@ffa.org or call 317-802-4312.

Win \$1,500 in Commercial Competition

If you're looking to teach your students about marketing communications, then you'll want to consider enrolling in Garst Seed Company's FFA Commercial Competition. The program has two components: the classroom curriculum that provides students hands-on exercises and a commercial portion where chapters can compete for up to \$1,500 for developing a winning radio, print or TV advertisement. Last year, Garst awarded nearly \$7,500 to nine FFA chapters from six states.

This year's theme "Raising Leaders Through FFA – Cultivating Agriculture's Future" helps highlight the benefits of being a member of FFA. The ads should highlight how FFA helps students become leaders and their role in keeping agriculture and related industries

viable. This is the second year Garst Seed has sponsored its national commercial competition. Ag instructors may register their chapters for the competition by sending a general inquiry e-mail to askgarst@garstseedco.com. Advisors may also register and download the curriculum, entry form and contest rules from Garst's website at www.garstseed.com by clicking on the news release titled Garst Launches Second Annual FFA Commercial Competition. Entries must be postmarked by October 3, 2005. Send entries to FFA Commercial Competition, c/o The Integer Group, 2633 Fleur Drive, Des Moines, IA 50321.

Beef Industry Scholarships

The Beef Industry Scholarship is a collaborative effort of the National Cattlemen's Foundation (NCF) and the Chicago Mercantile Exchange (CME). Twenty \$1,500 scholarships will be awarded to youths pursuing careers in the beef industry. All graduating high school seniors or college undergraduates involved in the beef industry are eligible to apply. Applicants do not need to be NCBA members. Applications for 2006 are due September 30, 2005. Full details of this year's program can be found on the NCF website www.nationalcattlemensfoundation.org/scholarship.aspx.

Chapter T-shirt Design Winners

Congratulations to the winners of the 2005 Chapter T-shirt Design Contest! FFA received and judged more than 350 designs! Six T-shirts will be sold in the 2005-2006 BLUE catalog and on www.ffaunlimited.org beginning September 1.

The winners of this year's contest are:

- Troy FFA Chapter, Missouri - "Blue & Gold Outfitters"
- Wall Lake View Auburn FFA Chapter, Iowa - "Rightside Up or Upside Down"
- New Berlin FFA Chapter, Illinois - "Who You Callin' Farmer?"

- Middleburg FFA Chapter, Florida - "Can You See Me Now?"
- Brevard FFA Chapter, North Carolina - "From the Farm to the Fork"
- Georgia FFA Alumni, Georgia - "FFA is Dynamite"

These chapters and affiliate will earn 50 percent of the gross profits on catalog and Internet sales of their T-shirts for one year. Be on the lookout for details about next year's contest. For more information about this year's contest, visit www.ffa.org/students/html/tshirt_contest.html, e-mail Dawn Sharp at dsharp@ffa.org or call 317-802-4271.

National FFA Band/Chorus/Talent Applications

The National FFA band, chorus and talent programs are a great way for members to express their creative side while participating in the largest annual youth gathering in the nation. Applications are available online in the convention area and are due to the national directors by July 1.



Ag Issues CDE Correction

The February issue of *FFA Advisors Making a Difference*, page 5, contained an error regarding revisions to the Agricultural Issues CDE. The statement should have read, "A chapter must present a minimum of five high quality public forums prior to their state-qualifying event in order to receive the maximum of 15 points. Forum presentations given after having won the state competition are encouraged, but will not count towards the portfolio score." The editors apologize for this error.

American FFA Degree Changes for 2006

beginning in 2006, the American FFA Degree application will contain several changes. The following information is provided to assist advisors and applicants.

Minimum Qualifications

As the application form indicates, among other certifications, the chapter president, chapter advisor, superintendent or principal and state advisor or state executive committee must certify all statements in the application and that the applicant conducted himself or herself in a manner to be a credit to the organization, chapter, school and community

Any American Degree application on which the applicant does not check that they have complied with all the regulations for filing local, state and federal taxes should explain this abnormality in detail on an added page.

Application Alterations

If the application is altered in any way, it will be disqualified. This includes copying the application into a Word document, altering the space given for responses for any questions or changing the font size below 10 points. For fairness, all applicants must respond to questions in the space provided.

Software Update

Microsoft Office is no longer supporting versions lower than Microsoft Office 2000. Due to that, we are requiring software to be Microsoft Office 2000. Some of the capabilities may work with Microsoft Office 97; however, FFA cannot guarantee it. For the calculations to work, users should upgrade their software to the 2000 version.

The National FFA Organization has received numerous calls from users indicating they are unable to open the application template. In discussing this problem, FFA staff members often discover the caller is using Microsoft Works rather than

Microsoft Office. The templates will not work in Microsoft Works; they are designed for use with Microsoft Office.

Cover Pages

Since the signatures have been moved to the front page of the application, some changes had to be made to the electronic applications by moving information from Cover Page A to Cover Page B. The application asks for the member ID number, but it is not a requirement. Since some students are away at college and don't have access to the chapter roster or their copy of *FFA New Horizons*, FFA doesn't require the member number. However, having the member ID number helps staff process the applications more quickly, so providing the information is helpful. Lastly, the Social Security number requirement has been removed from the application. However, it has been added to the Star Battery for audit purposes (all checks issued require a Social Security number).



U.S. DEPARTMENT OF EDUCATION
WASHINGTON, D.C. 20202-7322

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

PRSR.T. STD.
U.S. POSTAGE PAID
U.S. Department of Education
Permit No. G-17

Look for your next issue of *FFA Advisors Making a Difference* in June. It will feature stories on SAE programs, as well as provide teaching resources and FFA news.