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Agricultural Education Magazine Potpourri

EDITORIAL

Publishing in *The Agricultural Education Magazine*

by Harry N. Boone, Jr.

Typically I adapt my editorial remarks to the theme (and space) for the current month. Since the January-February issue has a Potpourri theme, I will take this opportunity to discuss publishing in *The Agricultural Education Magazine*. Keep in mind that *The Agricultural Education Magazine* is the professional journal of agricultural education.

Who Should Publish

Anyone with an interest in agricultural education at the secondary school level is invited to submit articles for publication. While a number of articles are submitted by teacher educators, I would like to encourage high school agricultural educators to take the time to share their expertise with their peers.

What Should be Published

Articles written by professionals about the practices of the profession are always popular. While information presented in the *Magazine* should have a base in current research, it is not a research journal. Articles should include practical applications that agricultural educators can use in their day to day efforts in the high school.

Where Should I Publish

There are many opportunities for agricultural educators to publish. You should consider sharing your expertise in publications relating to agricultural education, career and technical education, and education in general. From my perspective the "where" should I publish is obvious. *The Agricultural Education Magazine* is the journal for agricultural education professionals and should be a high priority on your list.

When Should I Publish

The Agricultural Education Magazine operates on themes. In the September-October issue the Editor publishes the themes for the upcoming year. Along with the themes, the Editor also selects a Theme Editor to identify potential authors, solicit articles, and perform the first stage of edits to the articles. The Theme Editor also prioritizes the articles. I use this list to determine the order of publication as well as make decisions if we have too many articles for an issue. As the Editor for the past five years I have asked the profession for theme suggestions.

Why Should I Publish

Although some individuals could argue with me (check the official definition of a profession), teaching agricultural education is a profession. As a member of the profession it is your responsibility to expand, support, and improve the body of knowledge associated with the profession. One way to meet this challenge is to share knowledge and experiences through workshops, mentoring, and publications. *The Agricultural Education Magazine* is a wonderful opportunity to advance the profession by sharing your insights and expertise.

Keep in mind the best articles for ***The Agricultural Education Magazine*** are the ones that have a clear point and share practices that can be used in the "real world" of teaching agriculture. ***The Magazine*** is a "hands-on" practical approach journal. Articles should share specific steps one can take to make teaching agriculture more enjoyable. Philosophical or theoretical articles are appropriate if they have a specific message and point and can be useful to the practitioner in the field.

Order of Publication

Articles that have been solicited by the Theme Editors and fit the current theme are given priority for the issue. I ask the Theme editors to solicit six to eight articles for each issue. Depending on the length of the articles, I have two options. If I have too many articles I will keep the "extra" articles and try to work them in a future issue. If I do not have enough material to fill the entire issue, I have to rely on articles not published in past issues or other submitted articles to fill the space. Therefore if you have an idea that does not fit one of the themes, go ahead and submit it directly to me at (harry.boone@mail.wvu.edu). Although it may take some time, there is a good chance that I can use the article.

I would like to thank the Theme Editors and authors that make *The Agricultural Education Magazine* possible. You are doing your part to advance the agricultural education profession.

Dr. Harry N. Boone, Jr., is a Professor at West Virginia University and Editor of ***The Agricultural Education Magazine.***

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Subscriptions
Subscription price for *The Agricultural Education Magazine* is $15.00 per year. Foreign subscriptions are $25.00 (U.S. currency) per year for surface mail, and $40 (U.S. currency) foreign airmail (except Canada). Orders must be for one year or longer. We can accept up to a three year subscription. Refunds are not available. Please allow 4 - 6 weeks delivery of first magazine. Claims for missing issues cannot be honored after three months from date of publication, six months for foreign subscriptions. Single copies and back issues less than 10 years old are available at $5 each ($10.00 foreign mail). All back issues are available on microfilm from UMI University Microfilms, 300 North Zeeb Road, Ann Arbor, MI 48106. UMI University Microfilms telephone number is (313) 761-4700. In submitting a subscription, designate new or renewal and provide mailing address including ZIP code. Send all subscriptions and requests for hard copy back issues to the Business Manager: Jay Jackman, National Association of Agricultural Educators (NAAE) 300 Garrigus Building, 325 Cooper Drive, The University of Kentucky, Lexington, Kentucky 40546-0215, Phone: (859) 257-2224, FAX: (859) 323-3919.
E-mail: NAAE@uky.edu

Article Submission
Articles and photographs should be submitted to the Editor or Theme Editor. Items to be considered for publication should be submitted at least 90 days prior to the publication date of the intended issue. All submissions will be acknowledged by the Theme Editor and/or the Editor. No items are returned unless accompanied by a written request. Articles should be approximately four double spaced pages in length (1500 words). Information about the author(s) should be included at the end of the article. Photos and/or drawings appropriate for the "theme issue" are welcomed. Photos/drawings should be submitted in an electronic format (jpg or tiff format preferred – minimum 300 dpi). Do not imbed photos/drawings in the Word document. A recent photograph (jpg or tiff format preferred– minimum 300 dpi) of all authors should accompany the article unless photographs are on file with the Editor. Articles in the *Magazine* may be reproduced without permission but should be acknowledged.

Editor
Dr. Harry N. Boone, Jr., Professor, Agricultural and Extension Education, West Virginia University, PO Box 6108, 2054 Agricultural Sciences Building, Morgantown, West Virginia 26506, Phone (304) 293-5451, FAX: (304) 293-3752.

E-mail: harry.boone@mail.wvu.edu

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THEME EDITOR COMMENTS

New Seeds for Agricultural Education Programs

by Deborah A. Boone

Arctic chill, polar vortex, snow, cold and more snow best describe winter in West Virginia this year. As a result of the extreme winter we now have to deal with potholes and ruts. As educators some of us get into ruts and find it hard to move out of the "what we have always done" routine. As many of us look forward to spring and all the new growth it promises, you may be looking for some new ideas to spring forth and add renewed vigor to your agricultural programs. This potpourri issue of *The Agricultural Education Magazine* compares to the new seed catalogs that are appearing in our mailboxes; it provides "new seeds" for the agriculture program. Some of the "new seeds" include how we might use social media as a recruiting tool, for educational purposes, and to market our programs. New garden tools are always welcome in spring, so check out the teaching tools for environmental education, insight into rejuvenating instruction in concrete, using powder coating as an affordable metal finishing application, or developing project based learning in food science. We often teach leadership, but have you ever thought about teaching followership?

We often find ourselves in a struggle to keep our students focused on the classroom when they want to focus on the technology at their disposal and frequently in their hands. Smart phones presents a number of challenges in the classroom, but when you embrace the technology and put it to work for education they can present many more benefits and opportunities than challenges. Dr. Noah Freeman outlines how smart phones can be used as a teaching tool using the camera as a means for students to demonstrate learning outcomes. Michael Woods discusses the benefits of being a "connected" agricultural educator by including the use of a webcam to improve agricultural literacy of a community and a more global audience. Dr. Robin McLean proposes social media as a professional development tool and compares characteristics of Facebook, Twitter and Pinterest. Dr. McLean also acknowledges the pitfalls to social media and offers solutions for potential pitfalls. Dr. Joshua Rice recommends and discusses ways he has successfully used social media to recruit students to the agricultural science programs.

Looking for some new "teaching packages" that focus on environmental management related to animal agriculture? Then you won't want to miss the article by Jill Heemstra, Dr. Shannon Arnold and Thomas Bass with numerous links to critical environmental education concepts, curriculum materials, study modules, Smartphone apps, TV shows, virtual tours, some materials translated in Spanish, and free "teaching packages" available online.

Franklin Reber and Dr. Connie Baggett remind us that concrete is one of the most widely used building materials in the world. Concrete furniture, soffit, siding, shingles, walls, countertops, tables and tombstones can be seen just about anywhere. Check out their article for ways to rejuvenate your ag program by providing "concrete" instruction.

Shelly Armour poses the question "Do we need to teach students how to follow or do they do it naturally?" Agricultural education stresses leadership, but Ms. Armour reminds us that to be good leaders we also must know how to follow. She provides some ideas on how to help students become better followers.

Methods to apply paint to fabricated metal projects can vary and may be limited by space, time, available resources and skill level. Dr. Ed Franklin suggests that a hobby-size powder coating system can be an affordable metal finishing process for agricultural educators with a limited budget. Dr. Franklin offers insight into system set up and use, as well as clean up and safety concerns.

Agricultural educators strive to keep up with societal changes which influence workforce needs. Dr. Don Edgar discusses the factors which influenced the development and implementation of a food science based program of study in Northwest Arkansas. The program emphasized project based learning and brought together industry partners who helped to develop curriculum where students were necessarily embedded and engaged in the learning process.

As we enter the spring thaw (hopefully), it is time to get out of our ruts of doing the same thing and check out the "new seeds" offered for agricultural education programs. Hopefully you will find just the right "seeds" to help your program grow and blossom, with new ideas and approaches to learning.

Dr. Deborah A Boone is an Associate Professor at West Virginia University and Theme Editor for the January-February issue of ***The Agricultural Education Magazine.***

Smart Phones as a Teaching Tool

by Noah Freeman

Over the past decade our students have become increasingly connected to the world outside of the classroom while we are trying to keep their attention in the classroom. With the development of new technology it is become increasingly difficult to keep students focused on the task at hand and away from the technology in their hands. It started with the cell phone and the occasional student forgetting to turn off the ringer during class, it then moved to text messaging where students could have a silent conversation with others during class, and in some cases, with the student across the room. We now have smart phones where students are connected to the Internet and social media as a constant distraction and soon we will have Internet-connected glasses where students will always have connectivity to somewhere outside of the classroom in the corner of their eye.

For years I had policies in my syllabus of no phone calls or texting during class and if you are caught using your phone it would be placed on the front table for the rest of the class. Over the years I have had many cell phones on the front table and many disagreements with students about cell phone use. This draconian policy was difficult to enforce and took away from my completely engaging with the students during classes. About a year ago I decided to change my policy and philosophy on use of phones in the classroom and instead develop ways to use the technology as an educational tool rather than fight it.

> The next step was to encourage students to use their phones as a learning tool.

Embracing the Technology

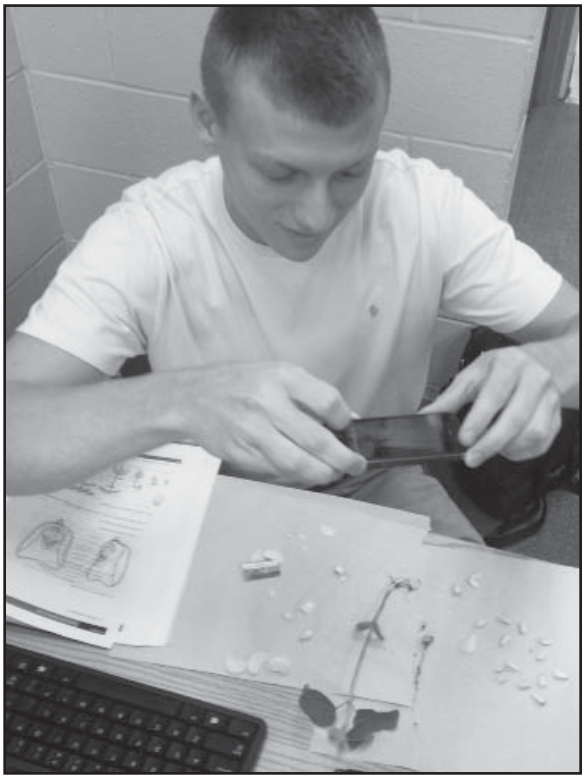
The first thing I did was to change policies in my syllabus about phone usage during class. I gave the students the freedom to text during class and take phone calls as long as it didn't distract other students. If I couldn't keep the students engaged during class then I have bigger problems than smart phones. The next step was to develop teaching methodologies to engage with the students and encourage them to use their phones as a learning tool.

Every Student has a Camera

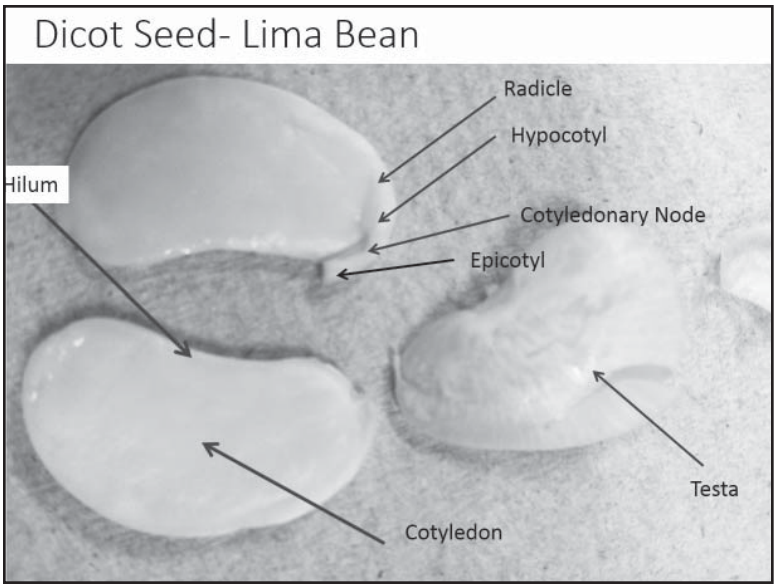
Students with smart phones have a camera and with a camera they can demonstrate learning outcomes. I have taken this idea and tried to incorporate it into as many activities as possible in my classes. The first camera activity that I developed was a seed and seedling parts identification lab in my introduction to crop production class. In this lab we dissect corn and lima bean seeds and seedlings and identify the parts and structures. In the past I would have students do the dissection and have them attempt to draw what they saw. The drawings would basically be just a copy of the book picture and very little learning and benefit to the student would take place. In many cases the dissection of the seeds and seedlings was just an afterthought to many students.

I now have students do the same seeds and seedlings dissections but they take pictures of the specimens with the camera on their phone. After taking the photos they send them to their computer and insert the pictures into their laboratory report, label the specimen parts on the pictures, and submit electronically for evaluation.

After the success of the first camera lab I have tried to think of other



Student taking pictures for the seed and seedling ID lab.



Example of student work from seed and seedling ID lab.

creative ways students could use the camera on their smart phone to facilitate learning outcomes. Here are a few of the exercises that I have come up with and I am always looking for more:

In my tillage and soil residue cover lab I have students take pictures of crop residue coverage before and after tillage and describe and discuss the impact of tillage on crop residue and effects of tillage on crop production and the environment.

For the grain harvest lab students take pictures of a list of combine parts and also pictures of seeds on the ground after harvest to calculate post-harvest loss. Student then have to label the pictures of combine parts and show post-harvest loss.

In my plant pest ID and control class I have students do a pest of the week assignment. The students have to take three different pictures of a given pest each week. They have to insert the pictures into a pest of the week report template and answer questions about each pest. For extra credit in the class I have the students add a picture of themselves with the pest of the week as a status update on Facebook. I personally enjoyed seeing the students post the pest of the week on Facebook and reading the comments their Facebook friends would leave. In future assignments I want to continue to explore ways social media can be used in the classroom.

I also use the smart phone for students to prove to me they actually completed a laboratory activity or exercise. An example is that in my introduction to soils unit we do a soil color and texture lab. In the lab I have students determine soil color and texture of different soil samples. Rather than just write down the soil color and texture of the sample, I have them take a picture of the soil sample next to the correct Munsell color chip and also have them take a picture of the completed soil ribbon test for each soil sample.

Information at Their Fingertips

In an attempt to keep students focused during lecture and discourage texting and using the Internet for non-class work, I have created a lecture worksheet that has to be completed during each class lecture. The lecture worksheets are essentially a lecture outline in question format for the students to complete. The lecture worksheets have been an amazing way to keep the students paying attention and focused on the class and every student essentially taking notes. Since starting to use the lecture worksheets I have had an increase in attendance and a substantial increase in active participation.

At this point the lecture worksheets had worked great but I still had not incorporated the use of smart phones into my lecture materials. After the initial creation of the lecture worksheets I started to imbed questions into lecture materials and lecture worksheets that student need to use their smart phone to look up the answer. Depending on the question, I don't share the answer with the entire class in an attempt to get all students to look up the answer. In other cases I use the smart phone questions and answers as a point of discussion in the class to start a future topic. My goal is to have a smart phone question about every 10 to 15 minutes of lecture. I have made the lecture worksheets worth 10 percent of the course grade and when grading the lecture worksheet I only grade the smart phone questions for the correct

Students taking pictures of crop residue coverage.

Example of student Facebook status update with pest of week.

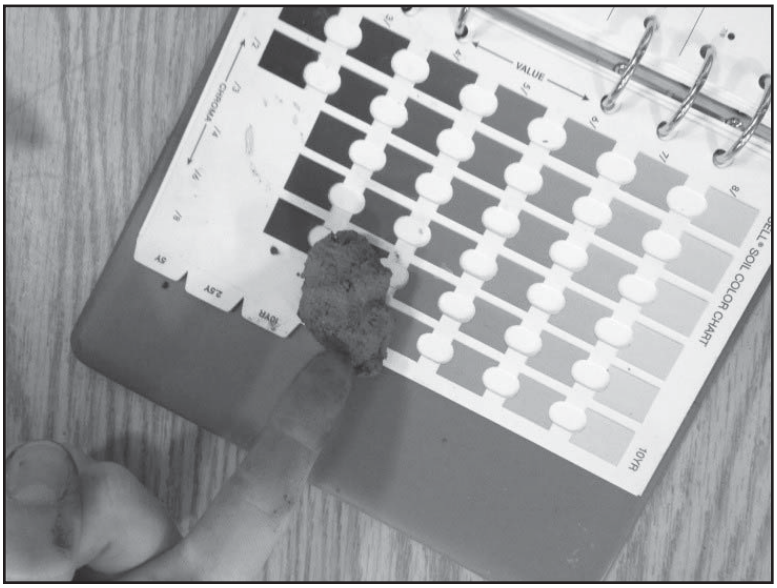
Example of student soil ribbon test verification.

answers. I view the rest of the lecture worksheet as the students taking notes and only check for completion while grading.

In the future my plan is to make the worksheets available for students to complete on a tablet or touch screen laptop. I have students draw lots of pictures on the lecture worksheets therefore any device would need to be capable of allowing students to draw pictures. Students would then be able to submit worksheets electronically for grading with some automatic grading possible. I am also beginning to imbed multiple choice questions into my lecture notes and worksheets that help me to gauge how well students have learned materials prior to exams.

Summary

In the past year I have completely reinvented the way I teach and relate to students during class utilizing smart phone technology and it has been a very positive change. I seldom have students not paying attention during lecture, not actively taking notes, or missing classes. I also no longer fight with students about not using their smart phone during class.



A student using soil color verification.

The other day after class I was talking with a student as she was working on one of my camera lab assignments. I asked her if she liked the incorporation of smart phone activities in class and if other teachers were trying similar activities. Her response was very positive in that the smart phone activities were very helpful in her learning and gaining a better understanding of the materials. She also responded that no other teacher had used smart phones as teaching tools.

I hope that others can learn from my success of embracing the use of smart phone technology in the classroom and come up with creative ways to engage students.

Dr. Noah Freeman is an Associate Professor of Agriculture at Ivy Tech Community College Lafayette Region, Lafayette, IN.

Being a "Connected" 21st Century Agricultural Educator; It's "Peaches" for Ag Literacy!

by Michael K. Woods

As agricultural educators, we often answer the questions, "What do you teach?" Or, "Why do they have agriculture in school?" We struggle with the implication that we must justify our importance and our professional passion. What if our purpose and goals were easily understood? I pose this: What if social medial tools of 21st century educators helped educate not only the authentic purpose of your program, but also to promote agricultural literacy community wide?

> We have the capability of putting agriculture at the forefront by effectively and quickly disseminating information via social media and modern technology.

In our program at Cumberland Valley we recently had the opportunity to do just that. In January of 2013 we adopted a pregnant Berkshire gilt, who was quickly, and affectionately, dubbed "Peaches" by our students. "Peaches" and her reproductive journey led to the education of a suburban, and eventually (to our surprise and delight!), global community using a web cam feed that had over 6,500 views via UStream (www.ustream.tv). The videos were dually posted on YouTube (www.youtube.com/mkw5001). The videos led to a blog (peachespig.blogspot.com) with 2,500 views and a twitter campaign that resulted with over 52,700 followers reading about agricultural education and student achievement. Connected agricultural educator indeed!

Welcome to the rapidly evolving 21st Century where we are quickly becoming a part of the "Twitterverse," Facebook, Instagram, YouTube, and Pinterest among many other social media venues as we tweet, post, and pin anything and everything related to life and work. With the vast assortment of new teaching tools literally at our fingertips, are we as agricultural educators using them effectively inside and outside of the classroom? Are we still apprehensive to use these new, perhaps foreign, and to a degree scary technology tools in our teacher's toolkit?

Relax. Take a deep breath. Let's examine how a wide variety of social media is already being used by our 21st century agricultural education colleagues across the country to make our society more globally aware about our programs and about the importance of agriculture. Let's take a look at Mr. Matt Eddy, CASE Certified Instructor and FFA Advisor at Southeast Polk High School in Iowa. During the Iowa State Fair, Mr. Eddy (connect with him on Twitter @AgEd4Me) posted quick references via Tweets about cattle check-ins, show results, and general updates about happenings at the fair. He also uses FourSquare (https://foursquare.com) to tag his locations when visiting agricultural education hotspots and points of interest. This allows 'followers' to trace his recent activity and possibly frequent similar locations and sites of interest.

A web cam was used to share the educational activities with a global audience.

What is Dr. Robin McLean doing in the great state of New Jersey? Dr. McLean is an agricultural science teacher at Northern Burlington County Regional Middle School who has used social media to promote ag literacy. Not only does she use her personal Twitter handle (@RCMcLean) to connect with agricultural and career and technical educators across the nation via her hashtag #CTEChat, she has also created a Facebook, Twitter, and Blog for her #TeachAg mascot (@HootieTeachAg). Her students and colleagues regularly follow her updates for assignments, classwork, programming additions, and general information.

How can we forget the use of social media as a recruiting and teaching tool for our professional organizations at our colleges and universities? Dr. Daniel Foster (@FosterDanielD), Assistant Professor of Agricultural and Extension Education at The Pennsylvania State University, encourages his undergraduate and graduate students to use social media as an educational and marketing tool. Students under his supervision manage various campaigns and educational tidbits via @TeachAgPSU, in addition to Facebook, Pinterest, Tumblr, and Instagram. Pre-service teachers at Penn State are being taught how to effectively and safely use social media professionally among their peers while student teaching.

What does this mean for you the local agricultural educator and FFA advisor? What if I told you we, as #AgEdu teachers, have the capability of putting agriculture at the forefront of education simply by effectively and quickly disseminating information via social media and modern technology? Well, we can! How you may ask? What if the Chapter FFA Reporter took the role of a Social Media Manager? As a part of the Program of Activities, what if we create a Social Media standing committee?

Michael Woods with a newborn pig shortly after birth.

We all know that the FFA is a student run organization which allows us to influence and mold our learning through applied STEM in agricultural education both inside and outside of the classroom. What if agricultural education went 'viral' via social media or started trending from the overuse of hashtags and '@' connections?!? Ultimately, the possibilities are endless. Ask yourself; How will YOU and your students be positive agents of change in your community? The trick is to overcome our fears and hesitations. Jump in with both feet and #TakeChances,. The water's fine!

Interested in learning more or want to share ideas? Tweet at me and follow me on Twitter using @CV_Aggie or follow our Ag Education Program and FFA @CV_FFA or 'like' us at www.facebook.com/CVFFA

Michael Woods' blog posting for the class swine project.

Michael K. Woods is a CASE instructor and FFA advisor at Cumberland Valley High School, Mechanicsburg, PA

Facebook, Twitter and Pinterest, Oh My! Using Social Media as a Professional Development Tool

by Robin McLean

Social media resources abound and are for more than just "being social." Facebook, Twitter and Pinterest can be used to enhance professional growth, find teaching ideas, and keep abreast of current trends in education. Although I initially joined each for personal reasons, each now plays a role in my professional development. Some might wonder "why have a social media account?" I have found them to be a tool to ask and answer questions, collaborate with colleagues around the country, get feedback, organize ideas, and remove the sense of isolation that sometimes comes with teaching a subject where I might not have a team of colleagues in the same content area in my building (see Table 1 for a comparison of the three resources).

In the Beginning

I initially came to use social media for personal reasons. I had friends who were discussing Facebook so I joined it to reconnect with friends from my high school and college days, as well as see family photos of those who lived far from me. I would check it every few days and see what was new from my friends. As my connections to friends increased I started to check on a daily basis but didn't consider that I would ever grow to use it professionally.

Unlike Facebook which I was using to personally network, I joined Twitter for a different reason. I had read somewhere that it would be wise to set up a Twitter account if I wanted my name because otherwise it might get taken. So I created an account to do exactly that, save my name. As it was, I couldn't get the name I wanted and settled for @RCMcLean. Then I let the account sit. I had no idea what I was going to do with it. I'd look at it every so often and started to follow traffic reports, local news, politicians, and some agriculturally related tweeters, including #agchat. I would tweet on occasion. Sometimes I would go for months without ever opening my account. I ignored it long enough that I even forgot my password. What could Twitter do for me professionally?

Pinterest, too, began for personal reasons. During lunch in the faculty room (*and yes, I believe in the value*

Table 1

A Comparison of Three Social Media Resources

Characteristic	Facebook	Twitter	Pinterest
Ability to curate/ organize items	Not easily	Mainly through creation of lists and favorites	On boards
Mark favorites	No	Yes	No
Privacy settings	Yes – varying levels	Yes – can protect tweets	Not really – can make pins unsearchable on Google; can set private boards only you see
Look up other users	Yes – can be challenging depending on privacy settings	Yes	Yes – search pinners
Ability to combine with other social media and manage from one location (such as Hootsuite)	Yes	Yes	No
Able to share with others	If they are your friend or in a group you are in	Through retweeting or more directly through an email	Can send to other pinners; able to share to Facebook or Twitter; can email

of going there so I can celebrate and share the wonders of agricultural education with my colleagues), discussion turned to pinning recipes, crafts and party ideas. I don't cook. I was working on my doctorate and surely didn't have time for crafts. Without children, parties weren't something I needed to plan. However, based on "peer pressure" in the lunch room, I created an account and began pinning books, quotes, recipes, workout ideas, and other essentially personal items. So began the journey with social media.

What happened that caused me to change?

As I saw friends on Facebook starting to "like" education based pages, I began to "like" them as well. Initial education feeds I followed included Edutopia, Edudemic, Free Technology for Teachers, National Science Teachers Association, ASCD and of course the National Association for Agricultural Educators. Reading posts from these sources would take me to articles related to integrating technology in education, science lesson ideas, and other education based content. As a result of commenting on posts on education based pages, I began to build my professional network.

Some of these readings on Facebook helped me to explore how I could use other social media for professional development. I began to follow the #edchat and #edtech hashtags on Twitter and if I could identify with something a person tweeted or liked an idea they shared, I started to follow them. These connections exposed me to ideas that would be applicable in my agricultural education classroom yet were coming from science, social studies and technology teachers from grades 3 to college level professors and from as near as my town and as far as Australia. A post that really resonated with me was the "Teachers Guide on Creating Personal Networks." It provided a plethora of social media tools as well as how I could use them to help me grow professionally.

Challenges in the beginning

As I began my journey into using social media for professional growth, there were some challenges. With so many social media tools available, I had to decide which ones I wanted to use. I also needed to determine what and when to share. At one point my mother claimed my Facebook feed was full of too many agriculture and education posts. Another challenge was developing a routine for using social media to grow professionally without getting completely absorbed in it. It is truly possible to lose hours on Pinterest and Twitter not solely by staying on the social media platforms themselves but by visiting the resources they provide connections to.

> Social media can be used to find teaching ideas and keep abreast of current trends in education.

How do I use them today?

Facebook: As with many other technological resources, my use of each of these social media tools has evolved. I still use Facebook as a mainly personal tool; however, there are pages that I follow that help to grow me as a professional. I've added to the initial core I started to follow as I developed Facebook into a location for professional resources. I share some of them as they might be useful tools for you as you develop your own professional network. Some of these pages include Curriculum for Agricultural Science Education, a variety of state FFA associations, local FFA chapters and FFA alumni, as well as state agricultural education and/or career and technical education associations, and the Association for Career and Technical Education. To keep connected to agricultural education, I follow Teach Ag Penn State, TSU Ag Ed, Teach Ag and 4-H. I stay current on agriculture issues and facts through Ag 101, American Farm Bureau Federation, state farm bureaus and Ag Careers.com. I have found that knowledge without motivation will not get me far and therefore I follow Venspired and I Appreciate Teachers.

Although I know some educators choose to keep their Facebook as a solely personal place and that is the main focus of mine, I seek professional benefits through making connections on Facebook. One of the assets has been the ability to serve as a virtual mentor for another agricultural educator in my state. Tiffany Morey was teaching in Northern New Jersey and I in Central during the early portion of her teaching career. During the times between face to face conferences we were able to share teaching experiences, challenges, opportunities, and other issues via Facebook chats. Kellie Claflin is another educator who I connected to originally through NAAE Communities of Practice and Twitter, then "friended" on Facebook. I have grown to look forward to see what she is doing in

her agricultural education classroom and gain ideas for mine through what she posts.

Twitter: Twitter has become a tool to seek feedback and advice from colleagues. It provides real time communication. It allows me to see shared images of what people have been doing in their agricultural education programs and FFA chapters. If the image piques interest, I am able to inquire about what they were doing and consider ways to implement it into my classroom. One of the first agricultural educators I started to follow on Twitter was Matt Eddy (@AgEd4Me) because we served as Teach Ag Mentors together and I liked the passion he brought to the profession. As I began to connect to other educators, I would look to the essence of the person expressed through their 140 character Twitter biography. If one was lacking, I was less likely to follow them.

Twitter allows me to grow professionally beyond just the agricultural education area. It is an information source with links to educational policy and reform issues. It provides the opportunity to virtually attend events and conferences through following the designated hashtag for the event and the experiences tweeted by people attending. It is a way to network beyond conferences where I meet people. It is a way to seek feedback and help me practice being a lifelong learner.

Although I follow agricultural education related hashtags including #agedu, #FFA, and #teachag, I also make sure to include #careerteched, #preservice, #scied, and #STEM to increase the opportunity to receive information related to education and the diversity of resources with the potential to improve my practice. I have barely scratched the surface of educational hashtags. More which might meet your needs can be found by an author named Cybraryman who has an extensive list at http://www.cybraryman.com/edhashtags.html.

Table 2
Pitfalls Of Social Media

Potential Pitfall	**Solution**
Losing myself to social media	Set a time; set limits and stick to them
Pinning a resource to use and finding the school's surf nanny/ web filter has blocked it	Test resources at work before you plan to use them; have a "Plan B"
Thinking you will use every idea you find	Accept the fact the world it filled with great ideas, you can't use every one of them. It is great to have the resources there though.
Violating workplace social media policies	Know what the rules are. If there aren't any, apply your educational leadership to create appropriate guidelines.

Pinterest: The sole way I use Pinterest is as an idea organizer. I have created boards related to the content of each of the subjects I teach, as well as professional development opportunities, educational technology, grant prospects, and FFA ideas. If someone repins one of my pins, I use that as clue we might have similar interests and explore their boards. If there is one I think can add to my professional resources, I begin to follow it. Although this media does not provide as much interaction and dialogue as Facebook and Twitter, the resources shared help to fill my professional virtual toolbox.

Solutions for potential pitfalls

Through increasing my professional growth through social media, I have found challenges, as well as ways to conquer the challenges. They include:

Facebook, Twitter and Pinterest might not be the best tools for everyone. However, I have found them to be a source of shared resources, motivation, and commitment to a common cause. I have expanded my professional knowledge and changed some of my classroom practices based on resources I have found on them. For me, they are a tool to keep me current in an ever changing field.

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Dr. Robin McLean is a middle school agricultural science teacher in the Northern Burlington County Regional School District, NJ

Utilizing Various Media Sources To Recruit Students Into High School Agricultural Science Programs

by Joshua E. Rice

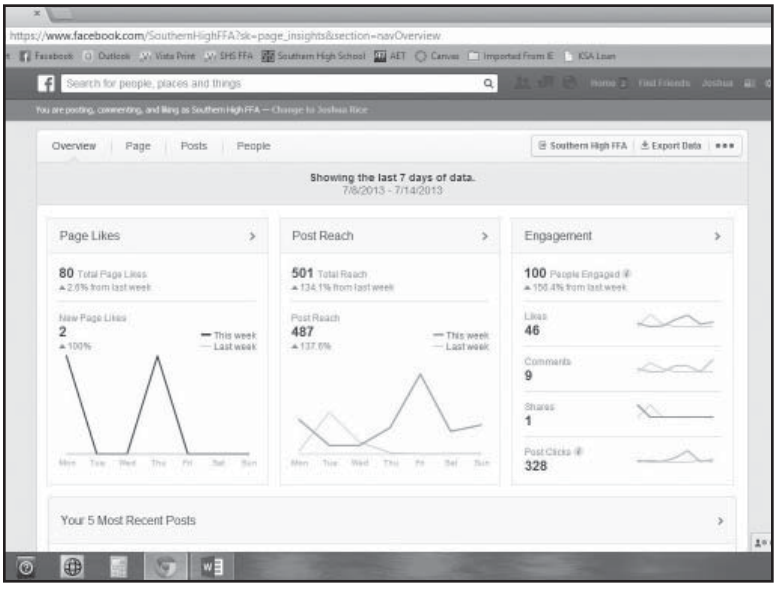
The student demographics within high school agricultural sciences classrooms are rapidly evolving throughout the United States. Attracting students into high school agriculture science programs is a vital part of developing, sustaining, and growing high school programs. It is important that high school teachers and guidance counselors utilize digital media, social networking, and print media to attract students to their program and also keep the parents and community informed on agricultural science program activities and achievements.

Over the past 20 years, the backgrounds of students enrolling in agricultural sciences courses have changed dramatically. Students are coming from more urban areas and are showing an increased interest in non-traditional agriculture careers. In addition to the change in the students, there have been drastic improvements in the technology used within the classroom and the role that media plays in the lives of students. The agricultural science program at Southern High School utilizes numerous forms of digital and print media to attract students to the program and also maintain community relations.

In 1991, Hoover and Scanlon conducted a national study of agricultural educators about their recruitment practices. Teachers ranked recruitment activities in the category "FFA organization activities" as most effective and most frequently used. Teachers ranked media; which included using local news-papers, radio, and television; as the least effective and least frequently used recruitment activity. In 2003, Myers, Dyer and Breja, conducted a study on recruitment strategies and activities used by agriculture teachers. The most often used recruitment strategies as reported by agriculture teachers were contacts with feeder schools, individual contact by the agriculture teacher and student contact with other potential students, utilization of the FFA, and the use of various publications (promotional brochures, videos, posters, bulletin boards, newsletters, newspaper, radio, television, and school announcements). The apparent evolution in recruitment strategies is most likely the by-product of an increase in the use and availability of technology and social media resources.

> Utilizing technology is one of the best recruitment techniques that agriculture teachers have at their fingertips.

When I began teaching at Southern High School in Harwood, MD in the fall of 2011, the school did not have an FFA and had an enrollment of 23 students in the agricultural sciences department. The school was offering two CASE courses (Intro to AFNR and Honors Plant Science). The greenhouse that was at the school had not been used for years and the classroom that was being used was a wood shop. The initial undertaking that I had to address was informing the students and community of the opportunities that the agricultural science program offered.



Activity summary for the Southern High FFA Facebook site.

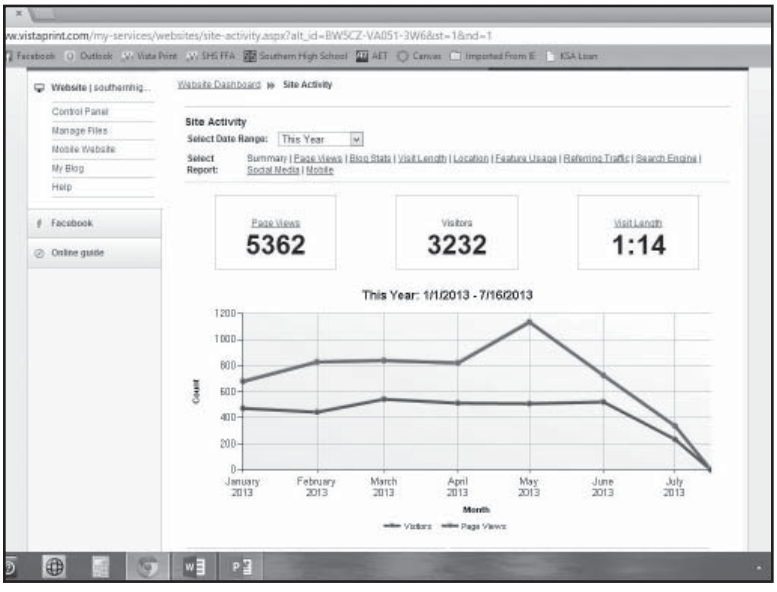
The first task that I took on after starting at Southern High was to charter the FFA. The FFA gave the students a common thread and a sense of ownership and responsibility. The group dynamic encouraged the students to work together and create group goals that they worked toward achieving. In essence, the FFA became the students' organization and they were the driving force behind the success of the program. Without participation from the students, the program would not have been able to develop past its infancy stage.

The second step in my recruitment campaign was to develop a digital FFA chapter newsletter. The newsletter highlights a different agriculture student each month, includes a calendar of events, a garden calendar, and also includes articles written by students who share their experiences within the classroom, laboratory, and their supervised agriculture experiences (SAEs).

The FFA reporter is responsible for the development and distribution of the newsletter. The reporter has a list-serve with the email addresses of all of the past and present parents of students within the program, the email addresses of all of the faculty and staff of Southern High School and Southern Middle School. Members of the Farm Bureau and community stakeholders also receive the newsletter. Currently, over 250 people receive the newsletter each month.

After the development of the newsletter, I realized that the chapter needed to have a place where perspective students, parents, and stake holders could go to keep track of chapter events and retrieve important information. I created a chapter website using www.vistaprint.com. The website costs $15.00 a month with unlimited pages. The FFA reporter and chapter members have the ability to modify/update the website whenever they choose. The website contains information about the following: courses offered, the National FFA Organization, SAEs, the Southern High FFA newsletter, the Southern High FFA horse judging team, and the Southern High FFA Alumni.

The website provides the chapter with monthly reports that allows the chapter to monitor the number of site visitors, the pages that are being viewed, where the visitors are located, and how long they are viewing the site. During the 2012-2013 school year, www.SouthernHighFFA.org received over 5,360 page views by over 3,200 different people.



Activity summary for the Southern High FFA website.

During my second year at the school, the enrollment of the agricultural sciences program increased to 54 students and there were now three CASE courses being offered (Intro to AFNR, Honors Plant Science and Honors Animal Science). The newsletter and chapter website were continuing to grow. As I explored new avenues for advertising I decided to involve more social media into the recruitment strategies. The majority of the students at Southern High School had Facebook and Twitter accounts. I decided to create a Facebook page and Twitter account for the Southern High FFA.

One of the major benefits of utilizing Facebook and Twitter is that the followers; students, parents, and stakeholders; have the ability to receive updates and information instantly on their computers or mobile devices. One of the potential pitfalls is that the information needs to be monitored closely due to the public nature of the social media tools. Making sure the privacy settings are secure and that there are media releases for the students is an extremely important safeguard that must be taken.

The students have embraced the social media tools utilized by the agricultural sciences program and they use them as a way to stay connected, not only with their peers and stakeholders, but also use them as a way to find other FFA members throughout the United States with similar interests. The social media accounts help to capture important photos and milestones for the chapter, and in turn, aids in development of the history of the chapter and increases the quality of the chapter scrapbook.

The Facebook page is widely followed within the Southern High community. Similar to the website, the Facebook page provides weekly data

to support the success of the public relations campaign. During the week of July 8, 2013, the Southern High FFA Facebook page reached over 501 people. There were 100 people engaged in posts and commenting on posts. FFA members, parents, sponsors, potential students, and community members follow the page and comment on the events that are occurring.

I am now in my third year of teaching at Southern High School and the agricultural sciences program has over 85 students enrolled. I largely credit the increase in membership to the public relations and social media applications that are utilized to keep the community informed. If the community and students are not aware of the events and opportunities that are available, they are less likely to become involved.

Traditional methods of student recruitment that were highlighted in the 1991 study by Hoover and Scanlon cannot be overlooked or left by the wayside. An agriculture teacher must deploy all means of recruitment possible to ensure a successful program. Agriculture teachers need to continue to visit students at their home or workplace. Teachers need to engage students in educational trips and conferences and should continue to illustrate the opportunities that are available to students through their participation in the National FFA Organization.

Today's agriculture teachers must also take into consideration the culture of their current and potential students. Students today are part of the technology generation. They get their news and updates on their phones and computers. They spend considerably more time utilizing electronic devices and would have a hard time imagining their life without their phones.

I attribute the increase in student enrollment within the Southern High agricultural sciences department to two strategies: the development of the Southern High FFA and the use of various media sources to recruit students and increase awareness. Ensuring that the past, present, and future students of the agricultural science program are kept informed of opportunities and activities taking place increases their awareness and interests in the program. Today's students are immersed in technology and utilizing that technology to get their attention, in my opinion, is one of the best recruitment techniques that agriculture teachers have at their fingertips.

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Dr. Joshua E. Rice is an agricultural education teacher at Southern High School Agricultural Sciences, MD.

Upcoming Themes

May-June

Experiential Learning in the 21st Century

Theme Editor: R. Kirby Barrick, Ph.D.
Professor
Agricultural Educ & Communication
College of Agricultural & Life Sciences
University of Florida
220 Rolfs Hall
PO Box 110540
Gainesville, FL 32611-0540
Email: kbarrick@ufl.edu
Phone: 352-273-2587

July-August

Assessing Student Achievement

Theme Editor: Andrew Thoron, Ph.D.
Assistant Professor
Agricultural Educ & Communication
College of Agricultural & Life Sciences
University of Florida
307C Rolfs Hall
PO Box 110540
Gainesville, FL 32611-0540
Email: athoron@ufl.edu
Phone: 352-294-1992

Building Environmental Leaders for Animal Agriculture: Teaching Tools and Curriculum Support

by Shannon Arnold, Jill Heemstra, & Thomas M. Bass

Young or beginning livestock and poultry producers, as well as those who advise, teach, and mentor them, are faced with a reality in which understanding environmental science and policy is a critical factor in management decisions. It is critical because not only does environmental management have implications in productivity and viability of a farm or ranch, but also in public perception and policy. The authors believe that producers who will be successful in the future will be able to: 1) practice and demonstrate environmental stewardship and comply with pertinent regulations, 2) consider the systemic implications and efficiencies of management decisions, 3) access credit and markets and enhance revenue by documenting positive practices, 4) reduce risks related to lawsuits and complaints, and 5) become proactive advocates for animal agriculture and part of policy development. As a result; producers, secondary agricultural educators, extension agents, and industry representatives must become better educated on environmental and natural resource concepts. Therefore, the purpose of this USDA-NIFA Young and Beginning Farmer Grant project was to develop livestock and poultry environmental management curricula, multi-media content, and activities usable in formal, informal and self-study agricultural education settings.

Through a coordinated, stakeholder driven approach, new educational resources were developed to address this growing need for environmental education. An online, research-based curriculum containing pilot tested, educational modules was developed for direct use by young farmers, secondary agricultural educators, extension agents, and industry representatives. These free "teaching packages" provide curriculum materials developed by university specialists and are linked to AFNR Career Content Cluster Standards. The self-contained packaged modules were developed using a multi-media approach, including online delivery and interactive forums. The materials include PowerPoints, videos, discussion questions, student worksheets, lesson plans, evaluations, references, and hands-on activities to teach about manure management, environmental policy statements, water quality regulations, greenhouse gases, and managing manure nutrients.

> Reliance on agricultural professionals to provide up-to-date information is becoming more critical.

Many concepts were identified as important in environmental education and it was recognized that the specific competencies related to each concept will be dependent on the type of operation and geographical location. The following technical subject areas were identified as the most important concepts related to environmental education today. The web content at http://www.extension.org/54360 is being organized around these core competencies with a vetted resource list of related curriculum and self-study materials.

Critical Environmental Education Concepts

Science Concepts

The USDA\NRCS acronym of "SWAPA+H" (soil, water, air, plants, animals + humans) was utilized as a starting point for a facilitated brainstorming session in which scientists, educators, and beginning farmers identified core environmental and agricultural science concepts required to be a successful producer. The following were identified as the requisite science concepts for evaluating information sources and making environmentally-sound management choices.

- Soil science/soil health

Competencies: soil sampling, interpreting soil test reports, biological, chemical and physical properties of soil

- Water quality and quantity

Competencies: identify water quality issues of local, regional & national importance, identify ag connections to these issues

- Air emissions (including greenhouse gases)

Competencies: identify air quality issues of local, regional and national importance, identify ag connections to these issues

- Plant science

Competencies: Basic plant anatomy, growth, reproduction, nutrient uptake, taxonomy

- Animal science

Competencies: Basic animal anatomy, growth, reproduction, nutrition

- Food safety

Competencies: Recognize potential risk areas for on-farm contamination of foods

Production Concepts

Almost every activity on a farm or ranch has potential environmental ramifications. This level of scrutiny or detail can be overwhelming, especially for a beginning farmer or rancher. Therefore, it was important to keep an eye on the "big picture" when identifying important concepts and competencies.

- Pest and disease management (plant and animal health/productivity)

Competencies: selecting appropriate control products at appropriate rate/dose

- Nutrient management

Competencies: Nitrogen cycle, developing a nutrient budget, calculating appropriate fertilizer/manure application rate, balancing ration to meet animal needs

- Grazing management
- Irrigation management

Competencies: calculate stocking rate and stocking density

- Production efficiency

Competencies: calculate product produced per unit of input

- Animal handling, stress, welfare

NYFEA event where young farmers and teachers/educators discussed the top issues facing agriculture. Environmental management was one of the top issues identified. The information from these sessions were used in developing the educational modules.

Even though animal welfare is not directly related to environmental management, the general public and consumer often use this as a proxy. Farmers/ranchers who appear to abuse animals or treat them inhumanely are also viewed with suspicion regarding their environmental management choices.

Management and Economics Concepts

In this conceptual area environmental stewardship was not mutually exclusive with profitability; quite the opposite. Environmentally sound management decisions often can lead to greater profitability.

- Regulations, policy, rules, liability
- Documenting and communicating stewardship efforts (record keeping)
- Quality management; systems management

Competencies: identify monitoring points and criteria

- Emergency planning
- Marketing opportunities related to environmental impacts

Communication, advocacy, public relations

A common thread in discussions is that farmers and ranchers need to be aware of how the public perceives their farm or ranch and to be proactive in communication and community involvement.

- Awareness of public perception
- Involvement in community
- Development of guiding principles (mission statement?) that includes a section on environment

Educational Resources

Website

The website showcases the modules and was organized around core competencies. This provides a starting point for beginning animal agriculture producers (or those that advise them) to identify funda-

mental topics, assess their level of knowledge in each of those, and be directed to appropriate resources for that knowledge level. The website can be found at http://www.extension.org/pages/32944/educational-modules:-building-environmental-leaders-in-animal-agriculture-belaa. The environmental skills and knowledge header that outlines the completed competency pathways can be found at: http://www.extension.org/pages/54360/beginning-farmer-and-rancher-stewardship-resource.

Curriculum materials (modules):

All of these modules have been cross-referenced to the national Agriculture, Food, and Natural Resources (AFNR) Career Content Cluster Standards.

- Environmental Regulations http://www.extension.org/61240
- Greenhouse gases http://www.extension.org/63908
- Managing manure nutrients http://www.extension.org/65573
- Manure Management 101 http://www.extension.org/66226
- Managing dead animals (video FAQ series) http://www.extension.org/68315
- Small Scale Poultry and Livestock http://create.extension.org/node/93826

Self-Study Modules

- Greenhouse Gases and Agriculture http://www.extension.org/64989
- Playing by the Rules http://www.extension.org/64950
- Manure nutrient planning, regulations, and water quality http://www.extension.org/65678

Spanish Materials

Two videos were translated into Spanish. The topic on both is sampling manure:

- http://www.youtube.com/watch?v=ZtS_CRLfy-8&feature=plcp
- http://www.youtube.com/watch?v=UWHowBRQ1gs&feature=plcp

A group of community college instructors and extension educators that were introduced to the curriculum and materials.

Sampling manure is a very important skill for a Spanish-speaking farm worker or farmer. Good manure samples are the basis of a nutrient plan—a vital tool for protecting water quality.

Another publication, "A Guide for Communication in Livestock Operations" http://www.ianrpubs.unl.edu/epublic/live/ec142/build/ec142.pdf, was developed as a tool to improve communication between English and Spanish speaking workers on the same farm. The guide includes many common terms as well as specialized words and phrases for manure management tasks. This publication was a collaborative effort with the University of Nebraska Extension manure management team.

Smartphone apps

- Manure Monitor:

  iTunes:https://itunes.apple.com/us/app/manure-monitor/id565101082?ls=1&mt=8

  Google Play: https://play.google.com/store/apps/details?id=com.movecreative.feedlot

- Manure Calculator:

  iTunes: https://itunes.apple.com/us/app/manure-calculator/id564930746?ls=1&mt=8

  Google Play: https://play.google.com/store/apps/details?id=com.movecreative.manurecalculator

TV show

Two grant project staff were involved in the writing and filming for a ½ hour television show that was shown on Nebraska public television titled "Modern Manure Management." This show was also submitted to other state public TV networks and to RFDTV.

http://www.slideshare.net/LPELC/modern-manure-management-fall-2012-14884589

The show was meant to highlight manure management career opportunities for ag students.

Virtual tour

One "virtual tour" of a community anaerobic digester was developed and published at: http://www.extension.org/pages/63540/cayuga-county-manure-digester-virtual-tour. Material and media for a second virtual tour of an on-farm dairy manure digester was collected and will be published within the next few months.

Material usage

- Slide sets and videos were uploaded to Slideshare at http://www.slideshare.net/LPELC
- Videos were posted to the YouTube channel at http://youtube.com/user/lpelc

Publications

The following website contains all of the curriculum materials and self-study modules: http://www.extension.org/pages/54360/beginning-farmer-and-rancher-stewardship-resources

An abstract and poster from the 2012 National Land Grant Sea Grant Water Quality Conference can be seen at: http://www.usawaterquality.org/conferences/2012/poster%20abstracts/Heemstra.pdf and http://www.usawaterquality.org/conferences/2012/Posters/Heemstra_poster.pdf

An abstract presented at the "Waste to Worth: Spreading Science and Solutions" conference can be seen at: http://www.extnesion.org/animal+manure+management. "A Guide for Communication in Livestock Operations"is available at http://www.ianrpubs.unl.edu/epublic/live/ec142/build/ec142.pdf

To summarize, this USDA-NIFA Young and Beginning Farmer Grant project sought to provide science-based and applied environmental education materials for potential, young, and new and beginning livestock and poultry producers. The hypothesized need for such materials was determined by experts in environmental management for animal agriculture, secondary agricultural educators, and industry representatives. The lack of educational materials and credible information on this topic was expressed by one agricultural educator who said, "Environmental education is a whole new area and more research is needed on how it fits into agricultural education curriculum standards." Reliance on agricultural professionals to provide accurate, up-to-date information to youth and adults is becoming more critical with societal changes. This must start at the secondary level and continue into the professional world.

Thomas Bass presenting the materials at the Agriculture's Promise event in Washington D.C.

Dr. Shannon Arnold is an Assistant Professor in Agricultural Education at Montana State University.

Jill Heemstra is an Extension educator in the Livestock and Environmental Management program, University of Nebraska.

Thomas M. Bass is a Livestock Environment Associate Specialist with the Montana State University Extension.

Rejuvenate Your Secondary or Post Secondary Ag Program with Instruction on Concrete

by Franklin C. Reber & Connie D. Baggett

Concrete has been known to exist since 3000 BC when the Egyptian Pyramids were first built with a primitive form of concrete, mud and straw mixed with gypsum and lime for the mortar. Although today's concrete is much better the concept remains the same. Concrete has become so popular that today it is used for nearly any building product. Concrete soffit, siding, shingles, walls, countertops, tombstones and most recently concrete furniture can be seen just about everywhere. Three weeks ago I was watching the show "Restaurant Impossible" when a facility was given a new makeover. They used polished concrete tables to replace the old ones.

> It is nearly impossible to look around you without seeing some form of concrete.

Instruction in Concrete Construction for Your Program

At the Pennsylvania College of Technology I have developed an instructional unit in concrete for post secondary education which could and has been adapted for middle and high school students. The first unit starts with the history and development of concrete and the concrete industry. This is followed by identifying quality concrete, tool identification, and Portland cement. Units five and six discuss proper sub-grade and form preparation. Unit seven deals with proper curing for adequate strength and durability. Unit eight discusses slab defects and methods and techniques to avoid them. Unit nine is proper reinforcement using wire mesh, reinforcement bars or "rebars," and both rod and mesh fiber. Unit ten is all about admixtures and their benefits. These units progress in a logical sequence so that one unit builds upon the previous one.

Student Evaluation and Grading

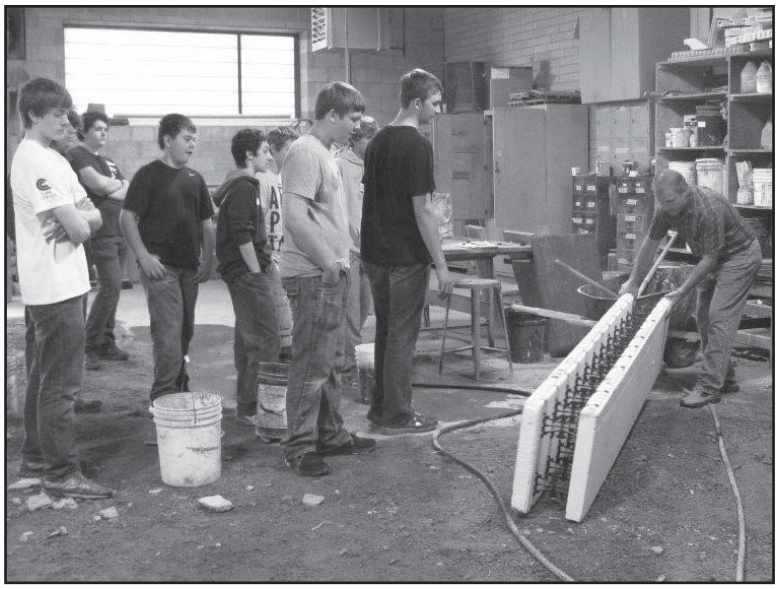
I have taught these units at the post secondary level but have also adapted components of them for seventh through ninth grade on career day as well as tenth through twelfth grade as an after school activity for a local high school.

SAEs or supervised agriculture experiences have been a part of agriculture education since the beginning. SAEs have changed significantly since the day of the large farm has become almost a thing of the past. Many students do not have the opportunity to complete an actual agricultural experiential learning experience on the farm; therefore, it is important to offer a variety of other experiences as well as introducing new ones. Concrete is a resource that could and should be used to allow students to complete their SAE requirements. When we evaluate all of the different uses of concrete in the agriculture industry, it should make us realize the importance of knowing and understanding concrete preparation, placement, finish and care. Some of the agricultural uses include insulating concrete form (ICF) walls, crop storage buildings, precast for livestock and dairy, pervious for the horticultural industry and redi-mix for floors. In addition, the growing

After school activity with Williamsport High School students making concrete stepping stones

interest in decorative concrete makes this material highly desirable.

Concrete is the most widely used building material in the world. It is nearly impossible to look around you without seeing some form of concrete. In most instances people don't even realize it is either concrete or a concrete product, such as the ICF walls on the Marriott or the finish on the face of Wal-Mart. The ever changing uses of concrete gives it both beauty and versatility. In addition, concrete uses a variety of by products from other industries such as fly ash and furnace slag which helps to make this a green product. All the attributes of concrete make this a material that would create a beneficial SAE experience for students.



After school activity with Williamsport High School students building insulated concrete form (ICF) walls.

Implications for SAE and Entrepreneurship

This unit of instruction compliments the unit that Shawn Abma (2010) wrote. Abma's unit was titled "Teaching Patio Designs Using Concrete Pavers." This unit was also described in the *Agricultural Education Magazine* (Vol. 83, No. 1, July/August, 2010). Secondary school students learning the information, skills, and techniques from both of these units will help prepare them for a strong SAE activity and perhaps for entrepreneurship upon graduation from high school. In the current job market, these skills will probably be well received.

Pennsylvania College of Technology students pouring and finishing sidewalks.

Franklin C. Reber is an Instructor at the Pennsylvania College of Technology in Williamsport, PA.

Dr. Connie D. Baggett is an Associate Professor of Agricultural and Extension Education in the Department of Agricultural Economics, Sociology and Education at The Pennsylvania State University, University Park, PA.

Should We Be Teaching "Followership" in Addition to Leadership?

by Shelley M. Armour

As agriculture teachers/ FFA advisors we stress leadership development with our students. Are we doing our students a disservice by not teaching them also how to be a follower? Sam Rayburn, former Speaker of the United States House of Representatives for 17 years, said "You cannot be a leader and ask others to follow you, unless you know how to follow too." The question to ask ourselves is, "Do we need to teach students how to follow or do they do it naturally?" I am going to argue yes we do need to teach them.

> The skills necessary to be a good follower are the same as it takes to be a good leader.

If you take a look around the current high school classroom you will see a generation that has always had "instant gratification." They have grown up with technology that immediately brings them what they want. They don't have to communicate with each other in a professional manner. Conflict is dealt with via text message or other electronic means. Our students have also been taught that it is best to be a leader, not a follower. When I tell my class they are going to learn leadership skills, but also "followership skills" I often get blank stares.

Let us not confuse followership with "servant leadership." While they are closely related they are different principles. Servant leadership is an excellent leadership model that utilizes a "top down" approach. The leader of the group puts the needs of the group before themselves. They share their power. They, however, are still the leader, not the follower.

When I was growing up in the FFA family, and even through most of college, I found the word follower to be a negative word. It was my job to lead the group, not follow along like everyone else. It wasn't until I became involved with some professional organizations and earned a place on a national board that I realized I needed to change my approach. I was at the top of the organization with ten other top-notch leaders. It was much like the idiom "Too many cooks in the kitchen spoil the broth." Here we had a group of leaders adding their own ingredients to the mix. Each wanted to leave their specific mark on the soup and did not always look at the whole recipe. This sometimes resulted in an argument that in retrospect was unnecessary. I realized that I didn't have to lead every activity. I could hone my skills and lead when I needed but I could also support others initiatives as a follower and that wasn't a bad thing.

As an agriculture teacher/FFA advisor, I follow the role of my officer station, the wise owl, and work to impart what I have learned, often through trial and error, onto my students. I strive to teach my students that they don't always have to lead a group. Someone can be a strong leader and a strong follower. The skills necessary to be a good follower are the same as those needed to be a good leader. According to *Forbes Magazine* the following 10 qualities make a strong leader: honesty, ability to delegate, communication, sense of humor, confidence, commitment, positive attitude, creativity, intuition, and ability to inspire. I also desire these qualities in someone that I am leading. Just because a student isn't the leader of the group doesn't mean they can't delegate or be creative with other members of the group.

If you want to work on this in your classroom I have a few ideas that I have utilized. One thing that I have done is divide the class into groups. I will build groups with several students that have demonstrated strong leadership skills. This forces the students, whether they realize it or not, to adopt different roles as there can only be one 'top dog.' While you do this exercise you can work on your other

(continued on page 25)

Shelley M. Armour is an agriscience teacher at SouthWest Edgecombe High School, Pinetops, NC.

Powder Coating: An Affordable Metal-Finishing Application For The Secondary Program

by Edward A. Franklin

One of the tasks of the agricultural mechanics laboratory instructor is supervising the method of application of paint to fabricated metal projects. After the chipping, grinding, and polishing comes the question of how to apply paint to finish the project. Methods vary and depend on space, time, experience, and resources.

Aerosol paint application in the form of a spray can is a common method and has the benefits of choice of colors, appearance of finish, cost, and availability. The limitations of aerosol spray cans include controlling overspray, clogged tips, disposal of cans, local regulations of purchasing by minors, the environmental concerns (emission of fluorocarbons into the atmosphere), and user inexperience with method of application.

Spray painting systems are common in industrial settings. Equipment includes a spray gun, siphon cup, air hose, and compressed air system. Application requires a well-ventilated area (typically a specially designed spray booth), masking and surface preparation, and experience with mixing paints to acquire the correct viscosity to flow through the nozzle of the gun that is matched to the appropriate air pressure (psi). Resources such as space, time for preparation, user experience, cost for materials, number of projects, and equipment may pose as limitations to such a method.

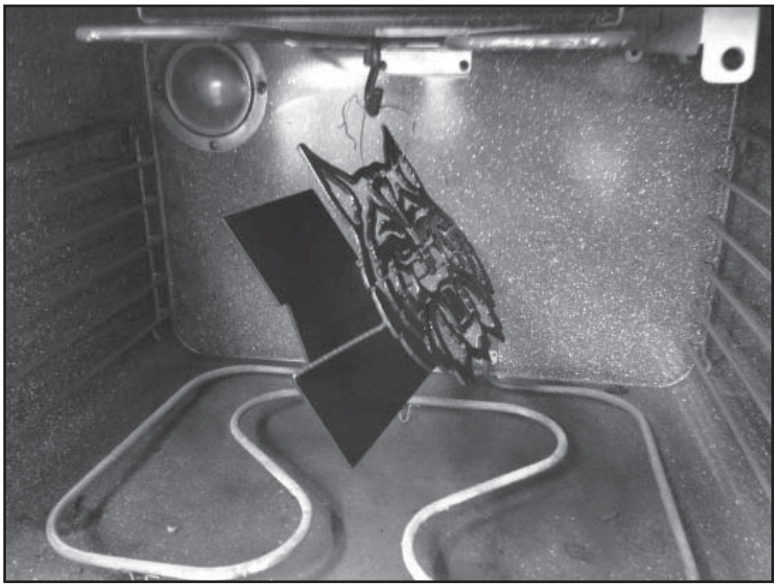
Powder coating paint application is a method used by both professionals and hobbyists. Equipment manufacturer use powder coating on metal surfaces such as frames and chassis, for reasons of ease of application, appearance and durability of finish, and consistency of quality of finish. The method of application involves the use of a spray gun, a siphon cup or bottle, a grounding clip, an electric power supply, a compressed air system, and an oven for paint curing. A small hobby-size system can range in cost from $60.00 to $250.00. Powder paints come in a variety of colors and finish appearances. Costs vary depending on amount of powder ordered, color, and finish. A 16-ounce bottle of white, red, yellow, or black powder paint can be acquired for as low as $5.00 from a vendor such as Harbor Freight Tools. A vendor such as Eastwood sells complete spray systems, powder paints, metal surface prepping supplies (such as wire, hooks, rubber plugs, paint stripping solution, etc.), spray booths, and curing ovens.

Can an agricultural educator with a limited budget afford to invest in such a technology? We wanted to investigate how a hobby-size powder coating system operates to determine ease of set-up and use, system clean up, and quality of application.

System Setup and Use

The hobby system operates on 120vac and requires a snap coupling to connect to a compressed air system. Such air systems are a common piece of equipment in the agriculture mechanics laboratory. A powder coating system requires a heating source to cure (or "bake") the powder paint to adhere to the metal surface of the project. According to the instructions for the hobby-size system, a powder-coated project is cured at 400 degrees Fahrenheit for 20 minutes. For our trials, a used electric oven was acquired. The limitation to the oven is the available space (cubic inches) inside the unit and the ability to "suspend" the project in the open space to prevent surface marks from appearing on the finish of the project due to contact with an oven rack or tray. Powder coat paint will

Powder coating paint application is a method used by both professionals and hobbyists.

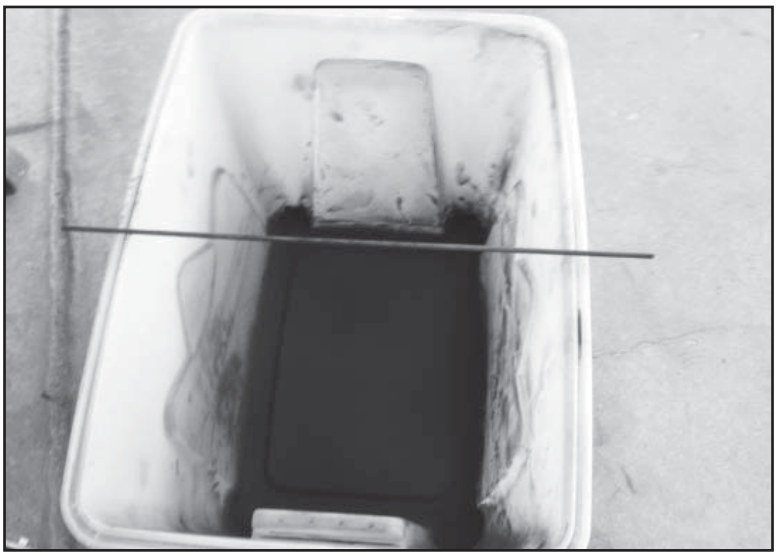


A powder coating system requires a heating source to cure (or "bake") the powder paint to adhere to the metal surface of the project.

adhere to all exposed surface area. Suspending the project using a small diameter wire and an "S" hook from a frame provides the applicator with the ability to "spray" the powder over all areas while turning or rotating the object. The alligator clamp (ground clamp) used to complete the electrical circuit can be removed and relocated to another part of the project. Our early attempts consisted of preparing a make-shift spray booth from a portable welding booth on a table on our patio. Brown paper and masking tape was used to provide an area where the paint powder from overspray could be collected. A small pipe "A-frame" was constructed to suspend the small projects. A paint brush was used to collect paint powder over spray for recycling. The foot-pedal is used to regulate the amount of voltage supplied to the project and increases the attraction between the negatively-charged paint particles and the positively-charged surface of the metal project. The volume of powder paint sprayed from the gun is regulated by adjusting the amount of air pressure (10 to 30 PSI) entering the gun. Attention must be paid to maintaining a gun tip to project distance of six to eight inches. Holding the gun too close to the project will result in an arc passing from the project to the end of the gun and causes a mark or blemish in the paint application. Touching the tip of the gun may result in the applicator receiving an electric shock. Also, over application results in a "runny" appearance on the cured project, similar to holding the aerosol spray can too close to the surface of a project. Once a satisfactory coating has been applied, care must be taken to move the project to the pre-heated oven for curing. Bumping, rubbing, or making contact with the painted surface project will remove paint from the metal surface. Set a timer for 20 minutes. Once cured, the project will have a "wet" appearance. Carefully remove the project from the oven using gloves and long-handled tongs or pliers. Hang the cured project on a rack to air cool.

System and Application Clean Up

To reduce set up and clean up time, a plastic container (15-quart size or larger, serving as the storage container for powder coating system components) may serve as a portable "spray booth." Larger projects can be sprayed over larger plastic containers. Over spray paint powder collected in the container is recyclable. Care is taken to move the powder from the sides and corners to collect in one pile. A small paint brush can be used to manipulate the powder. Powder paint is carefully poured through a paint straining fabric (available from local paint suppliers) pulled over the wide end of a plastic funnel and placed in the powder paint bottle. The powder is "sifted" through the fabric material as it passes through the funnel and returned to the storage bottle. Foreign material is captured and removed. Any powder paint not captured is simply "blown away" using a compressed air gun. The application gun, paint bottle or siphon

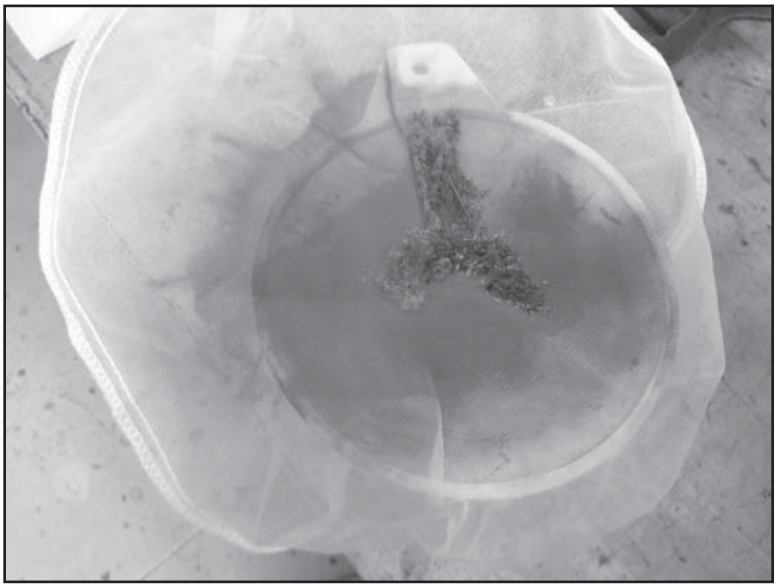


A plastic container (15-quart size or larger, serving as the storage container for powder coating system components) may serve as a portable "spray booth."

cup, power unit, and airlines are easily cleaned using a compressed air gun. The powder coating applicator gun, power unit, foot-pedal, ground clamp and cord, and airline can be organized and placed into the plastic container for storage. Additional useful items include the paint bottle (also serves as the siphon cup), a plastic funnel, paint fabric, brush, wire, metal "S" hooks, and 3/16" diameter rods (various lengths, for suspending projects over plastic containers).

Safety Concerns

As with all power tools with electrical connections, safety working around electricity is a concern. As mentioned, making contact with the applicator tip while spraying can result in an electric shock. Due to the size of the paint particles, application in a well-ventilated area away from an open-flame source is a must. Students should wear long sleeve shirts, safety glasses, and rubber or plastic gloves when applying paint powder. Students sensitive to dust should wear a mask over the mouth and nose to prevent from inhaling powder paint or a plastic face shield. Heavy leather welding-type gloves should be worn when placing projects in the oven and when removing items from the oven following curing.



Over spray paint powder collected in the container is recyclable.

For more information about power coating, powder coating systems, paints, preparations materials, ovens, and booths, check the websites for vendors such as Harbor Freight Tools (www.harborfreight.com) and Eastwood (www.eastwood.com). Harbor Freight markets a relatively inexpensive system and a limited variety of powder paints. Eastwood features a wider variety of systems and materials, and their site includes short video clips and reference materials.

Powder coating is a metal-finishing technology that can be introduced to a local agriculture mechanics laboratory curriculum with a minimal investment. The benefits include a cleaner application process, recyclable powder, and an affordable paint that requires no primer on clean metal surfaces.

Dr. Edward A. Franklin is an Associate Professor in the Department of Agricultural Education at the University of Arizona.

Should We Be Teaching "Followership"... ***(continued from page 22)***

students' leadership skills by pushing students that are normally followers out of their comfort zone. Within those groups they will have to work out positions until someone steps up and becomes the leader. With your officer team you can change the chairperson for each meeting and discussion. It will be uncomfortable for all students involved. It's easier to just make heterogeneous groups of leaders and followers but if we continue to do that are we truly exposing our students to everything they will experience post-high school? They are going to start at the bottom of the work ladder, more than likely, and need to utilize leadership skills to move up, as well as followership skills.

Reference

Prive, T. (2012). Top 10 qualities that make a great leader. *Forbes*. <http://www.forbes.com/sites/tanyaprive/2012/12/19/top-10-qualities-that-make-a-great-leader/>.

Project Based Learning: Initiating Food Science at the Secondary Level with Industry Input

by Don Edgar

Project based learning is not a new idea in agricultural education but as a current buzz word it has gained traction into mainstream education. Learning to do and doing to learn have been the mantra of educators about agriculture since its inception. As educators have gained new skills in and outside the classroom and with a renewed interest in where our food comes from and how it affects us, understanding and teaching through project based learning should be utilized by present teachers in today's agricultural education classrooms.

As educators, we continually strive to make a difference in the knowledge growth and acquisition of skills in our students. As agriculture programs grow in interest and student needs, teachers must determine how existing curriculum needs are to be adapted or development of new curriculum and/or courses are undertaken to keep pace with societal shifts. Presently, this has occurred in North West Arkansas. The advisors of Springdale High School, along with local industry input, did an extensive evaluation of their program to determine how best to impact their students in today's workforce needs. The result was the development and implementation of a food science based program of study.

How did it happen?

Springdale agricultural education teachers and Arkansas Department of Career and Technical Education staff brainstormed on how to develop and build this program once the need was identified. The first priority for teachers and state staff was that this program was not going to be a normal course idea when compared to the standard course offered by all teachers. This was due to limitations in equipment and other resources. Therefore, industry and local school district personnel were gathered to determine the ability to ensure the success of this program at its initial location within the state. This preliminary meeting also brought in University of Arkansas Food Science personnel. Together an action plan was formulated and future plans were outlined. In order to make sure the curriculum was relevant school advisors visited four Universities across the nation and one secondary school (Chicago School of Agricultural Science) to outline the curriculum and laboratory equipment needed.

Next, curriculum and frameworks were developed. Meetings with local industry were held to determine if equipment and curriculum frameworks met their expectations for future professionals. Reports were compiled and evaluated by outside personnel and recommendations were submitted to the state staff. Final program approval was provided by the state staff and equipment and laboratory space was completed.

Emphasizing Project Based Learning

In conjunction with state staff, the local teachers developed appropriate curriculum and associated activities with emphasis towards project based learning. It was a priority that the curriculum and teaching activities would emphasize project based learning. Thus, the importance of industry approved curriculum and equipment to emulate real world settings and parameters remained at the forefront. All involved parties expressed the need that students must be engaged and embedded in the learning process.

This course would not just be "hand-out" knowledge but focus on student acquisition of knowledge through projects with defined constraints. Therefore; the science, technology, and other related competencies espoused through this course would be a focus through student learning. Topics are introduced and associated projects are outlined to student groups that allow exploratory learning to occur. Boundaries of time are not essential because of the end product equaling knowledge and experience. Many projects require multiple attempts based on the lesson material to be covered. This is provided for in the teacher preparatory plans. The teachers believe that a one shot attempt does not ensure knowledge acquisition and students are encouraged to be creative in their thinking and experimental processes. For students, failure of an attempt just means we need to re-think what we are doing and try another way! This has produced students who can be more creative in their learning as well as those that understand they may not complete it perfect on the first try and it might take 4-6 times to get where we want to go.

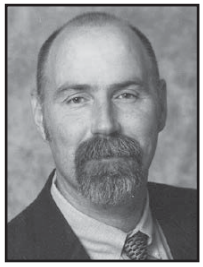
This learning environment fosters engagement and outside the box thinking. An example of a couple projects are measuring or delaying enzymatic browning also known as Maillards reaction. Students would analyze enzymatic browning then

determine methods of preventing or slowing this process to aide in food preservation and/or packaging. Students would set up the experiment based on the project and test different amounts. Through sensory testing, the correct amounts indicate how and why those elements affect final products. Another example would be the effects of food analogs. Food analogs are non-nutritive food additives such as artificial sweeteners. The emphasis on sensory evaluation and consumer perception as it applies to calorie counts is an excellent example of real world challenges faced by food processing companies. These real world scenarios enable students to solve these issues by applied food science.

Teachers, the District, and Students

The response to this program has been overwhelming. Although food based courses are not normally implemented or taught in departments of agricultural education, students have flocked to the program to gain professional skills. This school district is in an urban setting that has numerous industries associated with food based projects. Teachers have found that students enjoy the rigors of the courses and the style of learning presented to them. Many see the direct correlation between what is being learned and what employers expect which supports engagement and learning. Others enjoy the hands-on activities and social cognitive learning taking place in the laboratory. Teachers and students agree that the impact in their local community is evident through knowledge and employment opportunities. It is expected that students enrolled will look further at advanced education when previously that might not have been the case.

In today's educational environment there are many "new" ways to teach but learning through doing with success or failures impact knowledge and skills developed. Our professional environments involve people and the group project based learning emulated through this program exemplifies that notion. Students are given a program with parameters but it is up to them to come up with the final analysis and/or product. As a profession we know that project based learning works. We also know that we must tailor our programs around our community needs. This program has done so and brings out what we are: agricultural science teachers. Engaging future scientists of agriculture and providing experiences related to agriculture is what we do.



Dr. Don Edgar is an Associate Professor in the Department of Agricultural Education, Communications and Technology at the University of Arkansas.

Parameters for *The Agricultural Education Magazine*

The best articles for *The Agricultural Education Magazine* are the ones that have a clear point and share practices that can be used in the "real world" of teaching agriculture.

- Final copy should be two to four pages. A **four page-double spaced** manuscript (app 1500 words) is approximately two pages in *The Magazine.*
- Articles should be accompanied by a recent headshot photo of the author(s) (unless you have published in *The Magazine* in the past 24 months).
- If the author(s) has photos and drawings etc. appropriate for the "theme issue" for which he/she is submitting an article, please make sure the photos are of high quality and they tell the story. **Digital photos are acceptable, BUT must be 300 dpi or higher.**
- All photographs, drawings, etc., should be sent as stand-alone files (jpg, tif, etc.). **DO NOT** incorporate the photos/drawings, etc., into the Word document.
- **Manuscripts should be sent to the Theme Editors if at all possible,** however articles may be sent to the author(s). Theme articles get first priority in article selection for publication. General articles will be used when space is available.
- The Theme Editors have been provided with a timeline for their respective issue. Please work closely with Theme Editor on the submission deadlines.
- **Please make sure your name, job title, appropriate school/institution connections, mailing address, phone and e-mail address are available and clearly identifiable.**
- Each author is asked to sign a "release" form. This release form gives permission to reprint your article once it is published in ***The Magazine***. The release form will be sent to you when the Editor receives it as a submission from the Theme Editor, or if sent directly to the Editor, upon approval for use in ***The Magazine***.
- If your article is published, you will receive a free copy of the journal along with a letter of congratulations. Additional copies of ***The Magazine*** may be available from the Business Manager.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