**Connecting our Secondary and Adult Agricultural Education Program**

**With Post Secondary Agricultural Education Opportunities**

**Overview:**

**State College Community, High School, and Program**

The biggest industry in the State College area is education: The Pennsylvania State University, PSU; the State College Area School District, SCASD; and three other school districts including a Career & Technical Center are found in our community. Local agriculture is mostly small dairy farms, grain and hay operations, livestock enterprises, truck farms, tree fruit producers and small forestry woodlot owners.

Because PSU is our land grant institution, there is a College of Ag Sciences as well as Colleges of Science and Engineering within three miles of our high school. This provides a rich science presence in teaching, research and outreach. Also in the community there are many Ag Science professionals in: Extension, other governmental agencies and private industry -many of which are research based.

State College High School is a comprehensive high school with 13 Career & Technical Programs. There are 2400 students 9th -12th grade in a two building campus complex, and offers approximately 400 courses and 110 extra curricular clubs for students. We have 28 science teachers in the high school and an Agriculture Science teacher.

The Ag Science Program has grown from 32 students, in 1996 to almost 160 students currently enrolled in four Career Paths including: Animal Science, Plant Science, Ag Mechanics, and Natural Resources. Our program supports both FFA and Young Farmer Chapters. Both of these components provide numerous educational and leadership opportunities for secondary and adult learners.

Our program has received 40 grants totaling $370,000 in the past 10 years. The most recent grant, Service Learning, provided integration with our elementary curriculum as well as some local community groups.

Also scholarships for students from our school, that attend PSU in the College of Ag, have grown from $2,500/year to $38,000/year.

**Teaching Philosphy:** With the quality and quantity of agricultural scientists and scientist/engineers as well as the numerous agricultural professionals in our community; our program has improved using a philosophy of promoting and developing collaboration, partnerships and academic integration. My teaching/learning philosphy has been based upon educational models reflective of 21st Century Skills, STEM and Service Learning, which require me to be a lifelong and “lead learner” in my community.

Utilizing all levels of educational opportunities and community based learning our program and students have benefited from both a horizontal and vertical educational delivery system. These include: four Career Paths in Ag Science, adult education, post secondary collaboration, virtual course offerings, and Service Learning with Elementary levels.

These activities were also developed as “educational models” for others to

adopt; as well as to provide a framework for additional and easier replication for new opportunities that present themselves to our program. I am a “Life Member” of both PAAE and NAAE and have served in leadership positions, attended numerous state and national conferences. I have been selected as a National finalist in the National FFA Agrisicence Teacher of the Year and most recently, been named as a Christopher Columbus Agriscience Teacher Scholar. Lastly, participation in professional and agricultural association development activities at all levels, including the NAAE Communities of Practice, has provided my teaching/learning philosphy to develop into a “lead learner” approach not only as a teacher, but as a life learner. I have become more immersed in secondary teaching pedigogy; exposed to postsecondary methodology and connections to our profession; and effectively infused our community with adult education. Having the opportunities that abound in our school district that includes secondary, postsecondary, and adult education has been a welcomed set of challenges both professionally and personally.

**Post Secondary Connection – Seamless Conection of Educational Opportunities**

The program has provided PSU’s Agricultural & Extension Education, AEE 350, Methods in Teaching Ag Mechanics for the past 14 years. It also provided micro teaching opportunities as a part of AEE 412 for preservice teachers majoring in AEE for the last 12 years. Over 160 preservice teachers have benefitted from the experiences and methodology in these two courses. This connection to our program has increased numerous opportunities for both our secondary and adult (Young Farmer) learners as well as providing the most authentic learning outcomes for PSU’s preservice program. We have developed a model partnership with both institutions that has served our profession effectively by combining our budget, facility, student, and professional resources. This partnership has promoted sharing in many departments within PSU’s College of Agricultural Sciences with projects and educational opportunities for students at all levels – secondary, post secondary (undergraduate and graduate), and adult as well as provided professional development for the secondary teacher and post secondary professors and faculty. This connection has given me the oppoortunity as a “lead learner” to teach at another educational and development level.

**Strategies for Instruction, Experiential Learning, Partnerships, and Marketing**

***1. Program Career Paths and Dual Credit Options*** *-* Each career path is aligned with academics for both two and four year post-secondary preparation and offers both “On-Site” and “World Campus” courses. This was a program option developed utilizing a USDA Secondary Challenge grant. It allowed advanced students to take entry-level courses at PSU’s College of Ag Sciences. This provides additional resources, facilities and faculty to our program as well as an effective seamless transition to post-secondary education.

***2. Ag Safety – Tractor and ATV Safety*** *-* This started as the NSTMOP Certification, but developed into ATV safety activities with PSU’s Ag Engineering Department. As we provided statewide teacher and extension educator training sessions we also provided safety demonstrations on ATV safety and research. Students helped collect data on rollover situations and helped make safety videos used at the PA Farm Show and a segment on WPSU, Public TV. This has led to additional student participation in a “Tractor Slope and Rollover” research project. We have been asked and included in a federal grant to develop and pilot a NSTMOP “Train the Trainer” with our Young Farmer Chpater next fall for farm producers to teach employees needed safety practices.

***3. SAFE Mapping*** *-* FFA members and our program students participated in this agriscience and “Service Learning” project by interviewing local farmers and collecting on-site information about the farm operation. This data was then transposed onto aerial maps of the farms at PSU’s Geospatial Lab. This Global Positioning Satellites (GPS)/Geospaticial Information Systems (GIS) project provided the community’s Emergency First Responders and 911 with vital information about the farm in order to more effectively mitigate farm accidents or emergencies. Further use of this technology allows student to map farms, fields, crops and other GIS applications.Students presented these maps to participating farmers as well as doing project presentations to the Centre County Council of Government and as a featured Service Learning Project at the PA School Board’s Association’s state conference.

***4. Biodiesel Project*** *-* This project has become the largest as well as most complete model project that includes: 21st Century Skills, Service Learning, academic integration, collaboration, and partnerships. Students learned numerous scientific and research skills as well as providing new technical skills in alternative energy. Our students’ process used fryer oil from our cafeteria into fuel that is used in our power equipment and elementary school heating system. This project expanded by converting butter from the “Butter Sculpture” from the PA Farm Show into biofuel. Butter was more complex and challenging to convert into a biofuel because of the saturated fats and varied carbon chain lengths. Chemistry integration was extremely vital for project success. Students presented this project to numerous community groups as well as nationally to a Congressional Caucus at the Association of Career & Technical Educators (ACTE) “Going Greener” event. Myself as well as the chemistry teacher were invited to and serve on PSU’s College of Ag Sciences Biodiesel Team. This brings a multitude of resources to our program. Both the Pennsylvania Department of Education (PDE) and the Pennsylvania Department of Agriculture (PDA) provided grant funds for equipment and project resources. We developed six lessons and a powerpoint presentation that are now posted on PDA’s “Marketplace for the Mind” educational website. These lessons also won the National Association of Agriculture Educators (NAAE) Region VI “Ideas Unlimited” contest and was showcased at the ACTE/NAAE National Convention. These instructional materials and lessons were presented to two statewide workshops for teams of Agriculture and Chemistry teachers in PA. Lastly, newspaper articles and professional teacher journals were completed for this project and it is also included in the book *Fuel for Thought* –*Building Energy Awareness in Grades 9-12,* by the NSTA.

***5. Maple Sap/Syrup*** *-* This project was developed via nuclear chemistry integration and a grant from the Department of Energy. It was a student-lead project that focused on environmental impacts on Maple Sap quality. Trees were: tapped on our school campus; located on aerial photos using GIS; and samples analyzed to determine the microelements that may be present. Students took sap samples to PSU’s nuclear reactor and worked with technicians to identify microelements that were present in each sample. This was a student Agriscience project that won a silver award at the National FFA Convention as well as a project for her use in the PA Junior Science and Humanities Symposium (JSHS) at the state level.

***6. Whitetail Deer Energy Feed*** *-* This project is one of the most advanced study to date and we are the only secondary or post-secondary institution undertaking a project in this area. Our district and PSU are pursuing patent approval to protect our investigations. We are utilizing a glycerin by-product from our biodiesel project to provide feed energy for whitetail deer rations. We are working with the Animal Science department at PSU as well as their Deer Research facility to conduct our study. Also a Feed company has provided funding to test our glycerin and a biodiesel producer to provide additional technical support beyond the PSU Biodiesel Team. This project was presented at a BioEnergy Bridge Consortium and PSU’s Ag Progress Days. Students are currently concluding the second year of this study utilizing 22 yearling bucks to see how the addition of glycerin could affect deer health, antler development and hair coat quality. Lastly, students were video taped working on our biodiesel and this project by the Association of Supervision and Curriculum Development to showcase “Authentic Assessment Activities”.

***Student Organizations*** – The members of the State College FFA have been very active and successful at all levels of the National FFA Organization and have represented the FFA at various governmental functions as described in the projects outlined above. Our members have earned local to national degrees and proficiency awards. The Young Farmer Chapter has participated and led activities in the PA Young Farmer Association. Our members have also hosted and been apart of many of the projects in this application. I have also utilized the PSU Collegiate FFA Chapter and its members to work with our members and their activities. We look for their help and support as we provide another connection to their development in the preservice education program.

***Marketing Our Program*** – The program is marketed in many ways and has benefited from the partnerships and collaboration we have at every educational level. We do have 8th grade tours, parent’s night, and websites to promote our program. Many of the program and teacher awards have brought additional and more non-traditional students into our program. We have also seen more credibility from parents and other stakeholders in our program with the multiple and integration levels.

**Conclusion:** All of these projects and activities reinforce our philosophy of promoting and developing collaboration, partnerships, and academic integration. It involves students in both Service Learning and 21st Century Skill activities. If we can continue to maintain vested partners and keep them involved in at all levels of our agriscience program; our students, whether they are secondary, adult learners or preservice teachers, will have limitless and endless possibilities and opportunities in agricultural career development. The students will continue to think and develop career skills needed for jobs of the future we haven’t even thought of at this time.