Meeting Ohio's Agbioresource Need

An Innovative and Sustainable Plan for a Cutting-Edge School

By: State Senator Chris Widener

Executive Summary

Clark County and the surrounding counties have a rich history of growth and prosperity in agriculture and related industries. Harkening to the region's deep roots in agriculture—such as the founding of the 4-H Program in Springfield—it can be characterized as a key location for new and exciting innovations in education and workforce development. Clark County also possesses a strategic location near multiple institutions of higher education including The Ohio State University, industry leaders like Battelle and Scotts Miracle-Gro, and a strong network of school districts, career centers, and support institutions.

It is this region that will serve as an excellent setting for a new and innovative high school specializing in agbioresource studies; the agbioresource industry encompasses not only traditional agriculture, but food and animal science, environmental and landscape studies, and bio-based energy and industrial products. The agbioresource industry is the strongest industry in Ohio and is an exceptional asset for future economic opportunity. Budget cuts and an outdated view of ag-education have held back the potential for agbioresource courses to be intertwined with STEM and other 21st century science disciplines and approaches. This new high school will serve as a feeder for not only Ohio State and other educational institutions, but for employers who increasingly need a high tech and highly skilled workforce.

The goal of this new high school will be to equip students with the necessary knowledge, skills, and abilities so that they can be successful at an institution of higher education or be an asset to Ohio's strong and ever-evolving agbioresource industry. This mission will be achieved through strong partnerships with public and private partners and an innovative and engaging curriculum.

What is Agbioresource?

- *The agbioresource sector in Ohio is comprised of food, agricultural, green environment/landscape, and bio-based industrial products industries*
- *1 in 7 Ohioans are employed in the agbioresource industry—this amounts to more than 1 million people statewide*
- *The agbioresource industry has an economic impact topping $100 billion annually in Ohio*
- *Springfield's strategic location near Ohio State and other schools as well as employers like Battelle put it at the crossroads of this ever-evolving industry*

Creation and Accreditation

Based on discussions with education experts and policymakers there are 3 options to create this school, each with strengths and weaknesses.

1. *Structure as extension of Springfield-Clark CTC*: The Ag-STEM Academy would be operated by the Springfield Clark CTC. However, the Springfield City School District and Clark CTC would collaborate in the delivery of the Ag-STEM Academy. This would build on the strengths of both partners. State funding would include supplement for Career Technical Education (CTE). Foundation funding would be more robust and stable than with other models and Perkins grants are also available.

2. *Create independent STEM school*: Using the Dayton Regional STEM School as a model, the school would be formed as an independent STEM school under Chapter 3326 of the Revised Code. This concept, termed Ag-STEM, would focus heavily on ag-bioscience and bio-technology. As with the CTE model, students would be drawn from surrounding school districts. Unlike the CTE model Ohio State would need to be the lead on this concept, similar to Wright State's role in creating Dayton STEM. While State foundation funding for this concept would not be as robust as with CTE, there are other opportunities to earmark funds for this concept. Additionally, Ag-STEM would fit well into the existing STEM Learning Network.

3. *Form as independent charter school*: The final option would be to create a community school with either Ohio State or Springfield City School District acting as sponsor. This approach is least desirable as state foundation funding would be less than other concepts and the connection between public education, the industry, and a charter school would not be as strong. Furthermore, to date no public institution of higher education in Ohio has sponsored a charter.

Whatever approach is pursued, the overarching goal is to create an innovative and sustainable diploma-granting high school that will lead the way in agbioresource education in Ohio and throughout the nation. Additionally, Ohio State will need to grant course credit and acceptance for graduates in order to create a stable pipeline of students from 9th grade through post-secondary options up to a PhD.

Governing and Leadership Structure

The governance structure for the school will depend whether it is an Ag-STEM Academy under Springfield-Clark CTC, an Ag-STEM school, or a charter school. If the school is structured under CTC then leadership will be handled by the Superintendent and Board of Education for Springfield-Clark CTC. This would prove to be the easiest path as the leadership structure is already in place.

If the school is set up as a charter or Ag-STEM school then an independent governing board would be created. . Using the governing board from the Dayton Regional STEM School as a model, the governing board would consist of:

- A professor from Ag-Bioscience and related industries (preferably one for each area of study or school career pathway)
- Representatives from Ohio State, Springfield-Clark CTC, Clark State, Springfield City School District, and other educational elements impacted by school (local P-16 councils or ESC's, etc.)
- Representatives for local Farm Bureau, 4-H, and FFA chapters/organizations
- Representatives from private sector (preferably one for each area of study or career pathway)

In addition to the governing body or CTC board of education, an advisory panel should be established to provide additional expertise in curriculum development, school operations, and community and industry engagement. This panel should include Presidents (or their designees) from Ohio State and Clark State, Superintendents of Springfield City School District and Springfield CTC, the President of the Ohio Farm Bureau, and CEO's from industry leading companies.

Facility and Capital Needs

Following a consolidation of high school facilities in 2008 the Springfield City School District was left with a vacant building—Springfield South High School. The building is 250,000 square feet built on 16 acres; the building was fully remodeled in 1981. The building is in very close proximity to Clark State

Community College, the Clark County Public Library, Springfield-Clark Career Technical Center, and Springfield's city center, an area of focused economic development. The building is also immediately adjacent to the major fiber optic trunklines of Springfield, connected to Ohio's Third Frontier. The Springfield City School District has agreed to allow the building to be used and possibly have ownership transferred without a purchase price being assessed. This eliminates a potentially large start-up capital cost for the Ag-STEM Academy.

Key Partnerships

- *The Ohio State University (College of Food, Agricultural, and Environmental Sciences)*
- *Clark State Community College*
- *Springfield-Clark Career-Technical Center*
- *Springfield City School District*
- *Ohio Farm Bureau Federation*
- *Industry leaders including Battelle, Scotts Miracle-Gro, Dannon, & Ashland Chemical*
- *And…the COMMUNITY*

The building will still need renovations and retrofits in order to meet the needs of faculty and students. Up front capital costs are likely to exceed $1,000,000. These funds could come from Ohio State or educational institutions, capital appropriations or OSFC funds, private sector partners, or—in the case of Ag-STEM—funds appropriated through the *STEM Initiatives* line item in ODE's budget (this line item was zeroed out in HB 153)

Relation to Other Schools and Programs in Region

There are 50 separate school districts in Clark County and the 5 counties that surround it (Madison, Champaign, Greene, Miami, and Montgomery) that are potential feeders for the school. Theoretically, under the Ag-STEM model, students statewide could enroll in the school via the open-enrollment process. It is vital that the new school work collaboratively with area school districts and career centers in order to achieve maximum results. It is important that this school is seen as another option that complements the existing network of ag-education, STEM, and other educational options.

To accomplish this, the school will adopt a *portfolio approach* in the region in order to build a strong educational network that utilizes existing career tech centers, dual enrollment programs, ag-education and FFA affiliates, and higher education institutions. Through distance and digital learning initiatives as well as extracurricular opportunities, the school can increase the quality of education at surrounding FFA and ag-education programs. By creating a strong partner and asset for these programs we can alleviate concerns over a negative impact on the existing FFA and ag-education infrastructure

Student Enrollment

As an Ag-STEM Academy attached to Springfield-Clark CTC, this school will serve grades 9 to 12. Additionally, and in order to match student interests and passions with the curriculum, a distance and digital learning component should be established. This program could provide students in grades 6 through 8 with a foundation in agricultural bio-science and bio-technology while identifying those students that would be ideal candidates for the school.

It is recommended that in the first year of operation the school have both a 9th and 11th grade class, each with 100 students; 8th and 10th grade students at area schools should be offered a distance learning program to offer a survey of the agbioresource curriculum while building interest. In the first year 9th grade students would begin the standard curriculum while 11th graders would begin a special, targeted 2-year CTE program. By developing a special 2-year program for the first three years of operation, the

school can have a more rapid impact on the workforce and the post-secondary pipeline through Ohio State. After the first 3 years of operation this two year program will cease as the inaugural 9th grade class will be juniors and students who entered the school as juniors in the first 2 years will have all graduated.

Grades and Years Served

Year of Operation	School Enrollment	Grades at school	Distance Learning
1st Year	200 (100 per class)	9 and 11	8 and 10
2nd Year	400 (100 per class)	9 through 12	7 through 8
3rd Year	600 (150 per class)	9 through 12	6 through 8

The chart above breaks down enrollment targets and grades in the first 3 years of operation. As you can see, in the first year grades 9 and 11 are served, each with 100 students. In the second year all four grades will be served, again with 100 pupils per grade. In the third year class sizes increase from 100 to 150, increasing total enrollment to 600; looking at comparable high schools in other states as well as STEM schools in Ohio, 600 is a desirable target enrollment.

In addition, distance learning programs will target 8th and 10th graders in the first year to meet immediate enrollment needs, and will be expanding to grades 6th through 8th by the third year. Additional programs could be created to serve students at area high schools who do not attend the school. It's been said that 'a rising tide raises all ships', and utilizing the expertise and innovation at the Ag-STEM Academy could be a way to increase the impact that existing FFA and ag-education programs have on students, thereby expanding the footprint of the school.

Funding and Budget

As previously mentioned, initial capital costs are likely to exceed $1,000,000; total start-up costs for capital and first year operations will be upwards of $3,000,000. Once the school is fully operational revenue and expenses should stabilize; operating expenses once enrollment reaches 600 will likely start at $5 million, increasing annually. Per pupil need is $8,000, though with strong corporate and industry philanthropy, shared services and efficiencies, and reduced capitol costs this number could be reduced.

As mentioned above state funding will depend on the structure of the school. Under the Ag-STEM concept, funding is similar to a charter school; funding will follow students from their home districts to the school and is capped. If the school is part of Springfield-Clark CTC then state funding could be potentially higher, with CTE and ag-education supplements possible. Whatever model is used, funding will need to be constant and sustainable in order to create stability in school operations.

Curriculum Principles

It is critical that the curriculum encompass all facets of the agbioresource sector, meet the specified needs of higher education institutions and employers alike, and be adaptable to new and emerging trends in the industry. The goal is ultimately to create a learning experience that is realistic or 'actual', not simulated. Industry partners should be encouraged to sponsor labs and provide equipment and supplies used in the field along with guest lecturers and technicians. Additionally, much of the success of the school will depend on what students do outside of the classroom; co-ops, internships, and apprenticeships at industry partners are vital to producing the highest-caliber graduates.

Community engagement and volunteerism is another important factor to cultivate; students could grow food for area foodbanks or for other school lunch programs and could community residents with home and urban gardening techniques and energy and natural resource conservation. These types of programs not only make the school a strong asset in the education community but a key partner in the Springfield community.

Every 5 years, the Ohio Department of Education revises the *Agricultural and Environmental Systems Career Field Pathways and Course Structure*. This document specifies 7 different career pathways and the courses that would comprise them; currently no Ohio school offers all 7 and very few offer even one or two. This document should be the driving force behind curriculum development as it is developed with the needs of the agbioresource in mind. Career pathways are as follows:

A0 ..... **Agribusiness & Production Systems**
A1 ..... **Agricultural & Industrial Power Technology**
A2 ..... **Animal Science & Management**
A3 ..... **Biotechnology for Food, Plant, &Animal Science**
A4 ..... **Food Science & Technology**
A5 ..... **Horticulture**
A6 ..... **Natural Resource Management**

This curriculum should also be used to develop distance learning programs for middle school-aged students as well as program enhancements for existing ag-education programs at area high schools. Ohio State should be engaged in curriculum development and should grant credit for agbioresource coursework. By structuring a dual enrollment program and transferability of credits the pipeline between the school and Ohio State will be strengthened.

Faculty and Staff Needs

Using other STEM and ag-science schools as an example, the target student to teacher ratio would be 20:1. This means that, once the school is fully operational, 30 full time faculty members would be needed. Additionally, guest lecturers should be included to add additional expertise and insight to the overall curriculum. Factoring in administrative and support personnel total staffing needs would be roughly 50 employees. Depending on the structure and partnerships of the school, there is a potential to share services and staff with Springfield City School District, Springfield-Clark CTC, Clark State, Ohio State, and industry partners.

Under the Ag-STEM concept, teachers and staff would be employees of the Ag-STEM school, though like employees of Dayton STEM they might temporarily be employed by Wright State. Under the Ag-STEM Academy model, teachers and staff would be either employees of Springfield City School District or Springfield CTC; HR costs would be shared by both schools.

Using the budget for Dayton STEM as a model, total personnel costs would be over $3 million once the school is fully operational. Depending on the structure of the school these costs could either be covered entirely by an independent school or shared by Springfield City School District, Springfield-Clark CTC, and possibly Clark State and Ohio State if adjunct professors are used. Additional staff will be needed for adult workforce training, distant learning and outreach, and economic development projects. Also, a small staff will be needed almost immediately for planning and development before the school opens.

Adult Workforce and Economic Development Component

In addition to providing excellent educational prospects for high school students our school has the opportunity to be a catalyst for workforce and economic development in the region. The school can partner with existing programs at Clark State and other institutions to increase their impact and results or can create new programs to satisfy unmet employer needs. Additionally, the school can house a business incubator that will work in the region to increase the sustainability and profitability of not only farms but small and medium sized companies that are part of the agbioresource economy.

The school can also become a clearinghouse for ag support agencies including the OSU extension and USDA Farm Service Agency. Parents dropping off their children for class can stop by these offices and take advantage of training, job support, and other assistance. Additionally, the school can host college and career fairs for adults and students alike to learn about and be connected with opportunities in the agbioresource sector. Again, the goal is not to duplicate what is already being done, but to expand options and meet the needs of the region. The facility has an extraordinary amount of space with which to expand and be a catalyst for growth in the region and statewide.

Case Studies

Below are descriptions of notable agricultural high schools and programs throughout the nation. Additionally, there is a chart comparing budget and enrollment data from select Ohio STEM schools and existing ag schools and programs from other states. There are more than a dozen schools and programs nationwide focusing on agbioresource studies through a career-tech or STEM focus.

Agriculture and Food Sciences Academy—*Minneapolis, MN*

The Agriculture and Food Sciences Academy (AFSA) is located in Vadnais Heights, Minnesota. The school currently has 200 students from grades 9 to 12; enrollment is capped at 300. Current student to teacher ratio is 16:1. Enrollment will be expanded to 7th and 8th graders beginning next year. The school is an free public charter school sponsored by the Audubon Society. AFSA pools from 25 schools in the Minneapolis region. Graduation rate averages 94%; in 2009 91% of AFSA grads enrolled in a post-secondary program or college, with many attending the University of Minnesota. Per pupil need is estimated at $11,000; $8,300 comes from the state, the rest from grants, industry, and the Audubon Society. Total annual expenses are $2.9 million; the school also carries a 10% fund balance each year to cover unanticipated expenses. AFSA opened its doors in 2000. http://www.agacademy.com/se3bin/clientschool.cgi?schoolname=school393

Chicago High School for Agricultural Sciences—*Chicago, IL*

The Chicago High School for Agricultural Sciences (CHAS) is a specialized high school within the Chicago Public School System (CPS). CHAS has an enrollment cap of 600, though it is increasing to 720 next year. CHAS is the only school within CPS with an enrollment cap as it receives more than 1,800 applications for enrollment a year. This significant interest in enrollment is driven not only by the school's curriculum but by its high graduation rate and safe setting within Chicago. The school boasts a 92% graduation rate and close partnership with University of Illinois. CHAS opened in 1985 and has become widely-recognized as one of the finest ag-science high schools in the nation. Additionally, the CHAS farm stand offers products grown by the students on the school's 60+ acre campus. http://www.chicagoagr.org/

North Harford Natural Resources and Agricultural Sciences—*Bel Air, Maryland*

The North Harford High School Natural Resources and Agricultural Sciences Program is located in Bel Air, Maryland. In Maryland schools are administered by the county, as opposed to districts within a

county; this program is one of two ag career-tech programs in the county. The program's enrollment ranges from 50 to 60 students per grade. The program was created two years ago in response to the need to incorporate ag studies into STEM; to meet this need the program recruits teachers with science backgrounds as opposed to strictly agriculture. By structuring the program as a CTE, the school receives Perkins grants and other supplemental aid. According to school officials, one drawback to this program is that it is in a rural setting, so expansion is limited. In this instance the facility is driving the program, not the curriculum and needs of the students. http://www.hcps.org/schools/MagnetPrograms/NaturalResources.aspx

Comparison of budgets & enrollment for Ag-Science and Ohio-based STEM schools

School (City, State)	Students	Grades	Per Pupil Budget	Annual Revenues	Annual Expenses
AFSA High School (Vadnais Heights, MN)	200	7-12	$11,000	$2,800,000	$2,855,000
Dayton Regional STEM School (Dayton, OH)	338	7-11	$7,178	$3,002,514	$2,920,986
STAR Academy (Indianapolis, IN)	168	9-12	$8,500	$1,428,000	N/A
London Academy (London, OH)	385	9-12	$6,150	$2,367,292	$2,367,292
CHAS High School for Ag Science (Chicago, IL)	600	9-12			
Hughes STEM High School (Cincinnati, OH)					
MC2STEM High School (Cleveland, OH)					
Carl M. Small Regional Ag (Southington, CT)					
Norfolk County Ag High School (Walpole, MA)					
Saul Ag Science School (Philadelphia, PA)					

Conclusion

The need for this school couldn't be greater and it is obvious that the region possesses all of the necessary factors for success. We now have to connect the dots and take the next steps forward. The core partners in this endeavor are Springfield City School District, Springfield-Clark CTC, Ohio Farm Bureau, The Ohio State University, and Clark State Community College. Additional partnerships can include Greater Springfield Moving Forward (regional P-16 council), Clark County ESC, other schools and higher education institutions, and businesses throughout Ohio in the agbioresource field.

A successful rollout of this concept could lead to additional programs throughout the state. The stronger that ag-education is in Ohio the stronger our agbioresource industry will be. With billions a year in economic impact, this is an extraordinary opportunity put Ohio on the forefront of the agbioresource field and create sustainable growth and employment opportunities for the future. We must immediately create a working group to begin forming this school and must provide all support needed to make this concept a reality.

Brad Moffitt, Superintendent of Springfield-Clark CTC, Dr. David Estrop, Superintendent of Springfield City School District, Matt Grushon, Director of Strategic Initiatives and Special Projects at Wright State University, and Senator Widener's staff contributed to this report.

Attachments

1. **Ohio Farm Bureau Federation's *Ohio Agricultural Roadmap* Report**
2. **Background Information on Springfield South High School**
3. **Ohio Department of Education's *Agricultural and Environmental Systems Career Field Pathways and Course Structure* Document**
4. **Proposal from Brad Moffitt, Superintendent of Springfield-Clark CTC titled *Proposed Springfield Regional Agriculture Academy***
5. **Original Grant Request for Dayton Regional STEM School prepared by Wright State University**