January 7, 2021

Black Trailblazers in Engineering College of Engineering, Purdue University, West Lafayette, IN 47907

To whom it may concern,

I am writing to apply to participate in the Black Trailblazers in Engineering (BTE) Program at Purdue University in February 2021. I currently study Agricultural and Biological Engineering, at Purdue University. I expect to complete my PhD degree requirements by August 2021. I hope to learn success strategies from diverse faculty, administrators and students during this program, to develop a broader network of colleagues, and to more effectively contribute to the Land-Grant Mission as a researcher and educator in academia and beyond. I believe that my interdisciplinary research interests and academic and extra-curricular experiences make me a good fit for this program.

My long-term goal is to secure a tenure-track faculty position at a research intensive academic institution and to build a competitive research program and well-recognized teaching and outreach portfolios. As a result, I look forward to learning about academic job searches and interviewing, salary negotiation, transitioning to the professoriate, and engaging in and improving these cultures. My doctoral research involves investigating technological and social innovation in agricultural systems for research and commercial purposes. I specifically investigate how interdisciplinary planning, collaboration and stakeholder engagement position controlled environment agriculture as an advancement in production systems. Preliminary work has shown that teams exhibit characteristics that resemble intercultural communication that can be beneficial or challenging. To date, I have published my research in peer-reviewed journals and presented at conferences.

Throughout my career, I have worked on small and large diverse teams with principal investigators and as a team leader. I have integrated my research experience in both academic and non-academic settings. These experiences have enhanced my desire to reconcile the mismatch between human needs and available resources when designing, implementing, and disseminating research. I have mentored and been mentored across difference. This has helped me to learn, develop, and share strategies to improve the recruitment, retention, and matriculation of diverse pre-college and college students and the inclusion of postgraduate and underrepresented audiences. I have also engaged audiences across the US on critically promoting diverse participation in engineering and agriculture. These experiences helped me to win a grant award to study the intercultural competence of agricultural engineering students. I hope to further understand how students' attitudes, beliefs, and perceptions shift in the context of an intercultural approach to engineering. As a result, practitioners may find common engineering and social focus and effectively work with people who define problems differently. I believe the BTE program will me to foster connections to promote diversity and inclusion in higher education and beyond. I have included a copy of my curriculum vitae and a teaching and research statement with this application. Please contact me by email at <u>rsmith00@purdue.edu</u> or phone at 678-260-5063 if you need additional information. Thank you for considering my application.

Sincerely,

Ronald J. Smith

#### **Research and Education Plan**

The Black Trailblazers in Engineering (BTE) Program is a great opportunity to interact with current and future faculty and administrators from diverse backgrounds. I am primarily interested in developing a systematic understanding of how interdisciplinary planning, project management, collaboration and stakeholder engagement position controlled environment agriculture within in the larger agricultural system. This will help to organize, develop, adapt and increase the resilience of our production systems over time. My Ph.D. research utilizes theoretical, and field and geospatial studies to understand technological and social innovation in agricultural systems. Preliminary work on interdisciplinary teams yielded a minigrant award to study teaching and learning in an engineering senior design capstone class to improve intercultural competence of students in the Colleges of Agriculture and Engineering at Purdue University and beyond. I look forward to building on this work that seeks to understand how agricultural engineering students can work more effectively with people who define problems and their social condition differently than they do.

My future research program will combine engineering, plant science, and socio-ecological approaches to investigate food production, product enhancement, materials management, resource consumption, and waste reduction. The use of theoretical, field and laboratory studies, as well as outreach efforts will further these goals. As a researcher, I will provide a laboratory environment where students' natural curiosity can be harnessed to formulate, conduct, and publish innovative impactful research. I would like to develop an infrastructure that will support a research program to conduct serious scientific research, while attracting quality students and personnel whose educational and professional goals can be pursued. I believe that regular team-building and engagement is the key to learning how to conduct research, and how to communicate research results under different conditions for a variety of audiences. Students will be given the opportunity to present in each class. Hands-on experience is needed for all students, regardless of their end goal, in order to highlight the importance and interconnectedness of all the roles that are performed by members of a community, within and between disciplines.

I will pursue grant making opportunities with investigators across several disciplines. I seek to create partnerships with Civil and Environmental Engineering, Industrial Engineering, Horticulture, and Communication Departments to pursue grant making opportunities that will investigate design, project management, decision-making, technology diffusion, and outreach. To this end I will apply for internal grants as well as funding from agencies including, but not limited to, the National Science Foundation, the United States Department of Agriculture, the National Education Association Foundation, and the National Aeronautics and Space Administration.

My attainment as a person, student, and researcher has been shaped by many educators. During each period of my educational experience there were certain individuals who distinguished themselves in a manner that engaged, encouraged, and enabled me to look towards pursuing success at each turn. I hope to build upon these experiences to improve the education process, experience, and outcomes for students, myself, and my colleagues by increasing knowledge transfer and development, inside and outside of the classroom. As a future academic faculty, I seek to improve as an educator who will mentor, advise, and facilitate students to become future engineers, scientists, teachers, entrepreneurs, leaders, and lifelong learners. My objective as a teacher is guided by motivating students to ask meaningful questions and to critically think beyond their comfort zones. As a result, I will develop learning material that supports learning outcomes that are practical, theoretically and culturally relevant, and allow students to make interdisciplinary connections that translate beyond the classroom. One of my major goals is to establish my core objective of learning from students to help to formulate new methods that include inverted classroom and distance learning infrastructure, as well as new media that they are very comfortable with.

To date, I have had the privilege of teaching both undergraduate and graduate students in courses with both lecture and laboratory components. I hope to continue to train and mentor undergraduate and graduate students in the classroom and beyond to support the Land-Grant mission. A concurrent goal is for me to continuously improve my ability to communicate core course material, while providing an atmosphere for emergent learning. Course material and experiences will be designed so there is an evolving balance between submitted work, and student-teacher and student-student interaction.

Teaching effectiveness is both a function of student performance and student feedback. I will provide organized tutoring schedules with the help of advanced undergraduate and graduate student assistants, as well as regular office hours. I intend to teach basic sustainability courses during the first year of employment and will develop a course on systems thinking and application in agricultural engineering for the second year. This course will utilize new advances in sustainability science including decision support systems, and social-ecological frameworks and constraints that inform decision-making from personal to institutional levels. Through scholarship of teaching and learning, I hope to obtain feedback from students to help to continuously develop and enhance these courses. Students will be constantly be made aware of the need to focus on what they are doing, the impact of their actions, and the need to communicate effectively. As a result, the main objective of these courses is to learn the material, and to challenge its shortcomings so that they can learn from me, while they help to teach me to become a better educator.

Overall, I wish to create an active learning environment where diverse talents are respected and maximized. I look forward to working in an environment that supports communication, that respects multiple forms of diversity, and provides the climate for students, faculty, and administrators to grow and develop into prepared, well-rounded and insightful professionals. Developing and sustaining student learning, research, and communication will lead to enhanced outcomes with respect to the Land-Grant mission both personally and institutionally for my students, for me, and my institution as well. This is built on mutual respect between all parties involved.

I am excited about the opportunity to apply for the Black Trailblazers in Engineering Program. I look forward to hearing from you.

### RONALD J. SMITH rsmith00@purdue.edu

### 678.260.5063

225 South University Street West Lafayette, IN 47907 **Education** Purdue University, West Lafayette, Indiana PhD. Candidate Agricultural & Biological Engineering/ Aug. 2021 **Ecological Science & Engineering** M.Sc. Ecological Science and Engineering/Agronomy May 2015 Tuskegee University, Tuskegee, Alabama Plant and Soil Science M.Sc. May 2011 B.Sc. Plant and Soil Science May 1999

### **Areas of Interest and Expertise**

Food production systems, technological innovation, sustainable engineering, controlled environment agriculture, urban agriculture, engineering management and design, team dynamics and performance, producer decision-making, intercultural communication as a model for interdisciplinary research and outreach, and intercultural competence and mentoring.

Prior research efforts: testing a hydroponic crop production system in a modified shipping container for research use, evaluation of multiple use warm-season forages for soil and water conservation, animal production, and nutrient management, underutilized medicinal crops for domestic and international limited resource producers, and socio-ecological dynamics in crop ecosystems.

#### **Research Experience**

<b>Research Assistant</b>	<b>Purdue University</b>	2015 - 2020
<ul> <li>Develop and refine metrics</li> </ul>	s for evaluating and comparing controlled	d environment agriculture

- Develop and refine metrics for evaluating and comparing controlled environment agriculture (CEA) systems
- Conduct a systematic review of urban agriculture
- Site suitability analysis for urban crop production
- Stakeholder mapping and analysis for controlled environment agriculture innovation
- Site suitability analysis for controlled environment agriculture

# Graduate FellowPurdue UniversitySpring-Summer 2015Office of Multicultural Programs, Purdue University Graduate School

- Administrative support, database management, copyediting, metrics for URM success
- Studied group dynamics in intercultural and interdisciplinary settings with focus on academia
- Developed formal audits to prepare students for transitions to graduate school and postgraduate school life

### **Research Fellow**

**Research Assistant** 

## **Purdue University**

- Studied intercultural communication as a model for interdisciplinary collaboration, research, and education
- Conducted a primary review of nitrogen efficiency and uptake in corn

### Conducted inventory and analysis of forage species under greenhouse and field conditions

- Managed greenhouse and field activities for published research projects
- Formulated manuscripts for professional oral presentation
- Lab management, mentored undergraduate research fellows
- Developed and revised extension materials for Tuskegee University
- Collaborated in the development of two-stage surveys for forage producers in Alabama
- Presented research to extension and conference audiences

Examined intercultural communication to enhance interdisciplinary

academic, industrial, and governmental collaboration

### **Research Assistant**

### **Tuskegee University**

1999 - 2002

2012 - 2014

2008 - 2010

- Performed greenhouse and field activities for active research projects
- Collaborated on design and maintenance of conservation buffer strips at the George W. Carver Agricultural Experiment Station

### **Teaching Experience**

### Tuskegee University

PLSS 0100	World Food, Fiber, and People	(teaching assistant, 2009-2010)
PLSS 0501	Field and Forage Crop Production	(teaching assistant, 2008-2009)
PLSS 0521	Soil and Water Conservation	(teaching assistant, 2007-2009)
OREN 0100	Individual Growth and Development	(teaching assistant, 1999-2002)

### **Professional Development**

Preparing Future Faculty	Spring 2014
The Graduate School	West Lafayette, IN
Explored faculty roles and responsibilities and disciplinary	
paradigms as they relate to institutions of higher education	
Communicating Across Cultures	Spring 2014
College of Agriculture	West Lafayette, IN

### **Tuskegee University**

*Grants and Grantmanship* Department of Horticulture and Landscape Architecture Developed grant writing and review techniques, and panel reviews.

### Fall 2012 West Lafayette, IN

### **Peer Reviewed Refereed Publications**

Boling, P., E. Blackburn, J. Paine, and **R. J. Smith**. 2017. Farm-to-School in Indiana: The local politics of feeding children. *J. Hunger & Envir. Nutrit*.: 13(3): 385-395.

Ren, W., Y. Wang, J. Li, P. Feng, and **R. J. Smith.** 2016. Drought forecasting in Luanhe River basin involving climatic indices. *Theoretical and Applied Climatology* 130(3-4): 1133-1148.

Smith, R. J., E. G. Rhoden, J. R. Bartlett, V. A. Khan, S. Musser, A. Williams, B. Moore, A. Elliot, and J. Waddy. 2010. The importance of collaboration between Tuskegee University (Cooperative Extension Program) and the Natural Resource Conservation Service. *J. Envir. Monit. & Restor.* 6: 43-51.

Smith, R. J., E. G. Rhoden, V. A. Khan, and J. R. Bartlett. 2010. Production of eastern gamagrass accessions grown under greenhouse conditions. *J. Envir. Monit. & Restor.* 6: 35-42.

Smith, R. J., E. G. Rhoden, J. R. Bartlett, V. A. Khan, C. Drakes, and P. K. Biswas. 2008. The effect of lime application on the emergence and growth of castor oil plants. *Carib. Food Crops Soc.* 44: 401-407.

Smith, R. J. and E. G. Rhoden. 2008. Production of eastern gamagrass accessions grown under greenhouse conditions. *Carib. Food Crops Soc.* 44: 77-83.

Rhoden, E. G., J. R. Bartlett, **R. J. Smith**, and M. McIntyre. 2002. Quality of stockpiled eastern gamagrass forage. *Carib. Food Crops Soc.* 38: 434-439.

### Manuscripts under Review, Revision, or in Preparation

**Smith, R. J.**, R. M. Stwalley III, et al. 2021. What is Urban Agriculture: Systematic Review of Methods, Contemporary Issues, and Future Research. In preparation for *Current Opinion in Envir*. *Sust.* 

**Smith, R. J.**, R. M. Stwalley III, et al. 2021. A Stakeholder Analysis of Controlled Environment Agriculture Systems in the Midwest United States. In preparation for *J. Cleaner Production*.

**Smith, R. J.**, K. Quagrainie, R. M. Stwalley, et al III. 2021. Critical Success Factors for Controlled Environment Agriculture Systems: An Interdisciplinary Planning Approach. In preparation for *Landscape and Urban Planning*.

**Smith, R. J.**, K. Quagrainie, R. M. Stwalley, et al III. 2021. A Technoeconomic Evaluation of Controlled Environment Agriculture Systems in the Midwest US. In preparation for *Renewable Agriculture and Food Systems*.

### **<u>Conference Proceedings</u>** (peer reviewed)

**Smith, R. J.** and R. M. Stwalley III. 2020. Using an Interdisciplinary Approach to Assess Controlled Environment Agriculture. In *2020 ASABE Annual International Meeting*. American Society of Agricultural and Biological Engineers.

**Smith, R. J.**, and R. M. Stwalley III. 2019. Stakeholder Mapping of Controlled Environment Agriculture Utilizing the Technological Innovation System Framework. In *2019 ASABE Annual International Meeting*. American Society of Agricultural and Biological Engineers.

Smith, R. J., and R. M. Stwalley III. 2018. A Scoping Review of Urban Agriculture: Trends, Current Issues, and Future Research. In *2018 ASABE Annual International Meeting*. American Society of Agricultural and Biological Engineers.

**Smith, R. J.**, J. Houtman, and R. M. Stwalley III. 2017. A Site Suitability Approach to Sustainable Urban Agriculture Using GIS and Decision Analysis. In *2017 ASABE Annual International Meeting*. American Society of Agricultural and Biological Engineers.

**Smith, R. J.**, E. G. Rhoden, V. A. Khan, and D. Surrency. 2010a. Canopy characteristics of eastern gamagrass (*Tripsacum dactyloides L.*): implications for production in the Alabama Black Belt. *Proc.* 7<sup>th</sup>Eastern Native Grass Symposium. "Native Grasses on Working and Natural Landscapes" October 5-8, 2010, Knoxville, TN.

Smith, R. J., E. G. Rhoden, and V. A. Khan. 2010b. *Distribution* of trace minerals in eastern gamagrass accessions grown under greenhouse conditions. In *Proc. 66<sup>th</sup> Annual Prof. Agric. Workers Conf., "Facing Global Crises: Local Solutions to Energy, Food and Persistent Poverty,"* N. Tackie, T. Hargrove, R. Zabawa, and W. Hill (eds.), 209-215. Tuskegee, Alabama. December 7-9, 2008. Tuskegee University, Tuskegee, Alabama.

Smith, R. J., E. G. Rhoden, and V. A. Khan. 2010c. *Distribution* of macrominerals in eastern gamagrass accessions grown under greenhouse conditions. In *Proc. 66<sup>th</sup> Annual Prof. Agric. Workers Conf., "Facing Global Crises: Local Solutions to Energy, Food and Persistent Poverty,"* N. Tackie, T. Hargrove, R. Zabawa, and W. Hill (eds.), 236-244. Tuskegee, Alabama. December 7-9, 2008. Tuskegee University, Tuskegee, Alabama.

Smith, R. J., E. G. Rhoden, J. R. Bartlett, and V. A. Khan. 2008. Production of eastern gamagrass accessions grown under greenhouse conditions. In *Proc.* 64<sup>th</sup> Annual Prof. Agric. Workers Conf., "Meeting the Challenges to Sustainable Growth and Development of Rural Communities," N. Tackie, N. Baharanyi, R. Zabawa, and W. Hill (eds.), 155-160. Tuskegee, Alabama. December 3-5, 2006. Tuskegee University, Tuskegee, Alabama.

**Smith, R. J.** and E. G. Rhoden. 2006. Production of eastern gamagrass accessions grown under greenhouse conditions. In *Proc.* 5<sup>th</sup> *Eastern Native Grass Symposium*, M. Sanderson et al. (ed.), 50-54. Harrisburg, PA, 10-13 Oct. 2006. USDA, Agricultural Research Service and USDA, Natural Resources Conservation Service, Beltsville, MD.

### **Professional Presentations**

### **Conference Presentations**

McClure, M. D. and **R. J. Smith**. 2019. Essential Skills: Cultural Fit. Presented at "2019 MANRRS Region V Regional Cluster Meeting," October 19, 2019. Madison, Wisconsin.

Smith, R. J., B. Hunter, and K-N. Meeks. 2019. Promoting Underrepresented Minority Participation in Agriculture. Presented at "2019 Indiana Small Farms Conference," February 28-March, 2019. Danville, Indiana.

Smith, R. J., P. Morris, and E. G. Rhoden. 2018. Intercultural Dialogue to Shape Interdisciplinary Agricultural and Biological Engineering Research: A Commentary. Presented at "2018 ASABE Annual International Meeting," July 31, 2018. Detroit, Michigan.

Smith, R. J., P. Morris, and E. G. Rhoden. 2014. Cross Talk: Communicating Across Cultures as a Model for Interdisciplinary Research Content and Context? Presented at "*Ecological Sciences and Engineering (ESE) Symposium, 2014, #SCIENCE, Effective Interdisciplinary Communication,*" October 20, 2014. Purdue University, West Lafayette, Indiana.

Omotilewa, O. J. and **R. J. Smith**. 2012. Urbanization and Ecological Footprint: Where Does Sustainability Fit? Presented at "*Ecological Sciences and Engineering (ESE) Symposium 2012,* "*URBAN RISE: Footprints of a Global Civilization,*" October 16-17, 2012. Purdue University, West Lafayette, Indiana.

**Smith, R. J.**, E. G. Rhoden, V. Gathers, and C. Drakes. 2006. The Effect of Lime Application on the Emergence and Growth of Castor Oil Plants (*Ricinus communis*) Grown under Greenhouse conditions. Presented at 64<sup>th</sup> Annual Prof. Agric. Workers Conf., "Meeting the Challenges to Sustainable Growth and Development of Rural Communities," December 3-5, 2006. Tuskegee University, Tuskegee, Alabama.

### **Other Invited Presentations**

Smith, R. J., E. G. Rhoden, and V. A. Khan. 2009. Production of Eastern Gamagrass. Alabama Cooperative Extension Services, Macon County Extension Meetings, April 9, 2009. Tuskegee, Alabama.

### **Conference Abstracts**

Khan, V. A., E. G. Rhoden, J. R. Bartlett, and **R. J. Smith**. 2009. Application of poultry litter on winter wheat. Proc. National Conf. on Agric. & Nat. Res. Conserv. & Mgt., Oct. 15-17, 2009, Delaware State Univ., Dover, DE.

**Smith, R. J.** and E. G. Rhoden. 2004. Effect of acid soils on the growth and development of eastern gamagrass. In *Proc.3rd Eastern Native Grass Symposium*, J. Randall and J. C. Burns (eds.), 309. The North Carolina Botanical Garden, Chapel Hill, NC, October 1-3, 2002. Omnipress, Madison, WI.

Rhoden, E. G., J. C. Ritchie, **R. J. Smith**, D. T. Krizek, and M. McIntyre. 2004. Quality of stockpiled eastern gamagrass forage at two southeast locations. In *Proc. 3rd Eastern Native Grass Symposium*, J. Randall and J. C. Burns (eds.), 309. The North Carolina Botanical Garden, Chapel Hill, NC, October 1-3, 2002. Omnipress, Madison, WI.

### Honors and Awards

IndianaView Student Scholarship Program	2020
Demetrios Agathangelides Scholarship Award	2019
2019 MANRRS Research Discussion, 1 <sup>st</sup> place	2019
Bilsland Strategic Initiatives Fellowship, Purdue University	2014

### **Research Funding**

**College of Agriculture Agricultural Research and Graduate Education (ARGE) Grant, Purdue University.** *Smith, R. J.* and M. D. McClure. Professional Skills for Graduate Students. 2020.

Center for Intercultural Learning, Mentorship, Assessment and Research (CILMAR) Mini Grant, Purdue University. *Smith, R. J.*, M. D. McClure, and R. M. Stwalley III. Developing Intercultural Competence of Agricultural and Biological Engineering Capstone Students: A Primer. 2018-present.

### Service and Volunteering

Peer Mentoring Program with Mentoring at Purdue, Purdue University, College of Agriculture Junior Minorities in Agriculture, Natural Resources and Related Sciences (Junior MANRRS) Landscaping at Cary Homes for Children, Lafayette IN

### **Professional Memberships**

Agricultural and Applied Economics Association (AAEA) Agronomy Society of America (ASA) Alpha Epsilon (Honor Society of Agricultural, Food, and Biological Engineering) American Association for the Advancement of Science (AAAS) American Society for Horticultural Science (ASHS) American Society of Agricultural and Biological Engineers (ASABE) Crop Science Society of America (CSSA) Gamma Sigma Delta (Honor Society of Agriculture) Golden Key International Honor Society Minorities in Agriculture, Natural Resources and Related Sciences (MANRRS) National Society of Black Engineers (NSBE) Sigma Xi (Scientific Research Honor Society) Soil Science Society of America (SSSA)



15 January 2021

Purdue University Black Trailblazers in Engineering Selection Committee

Members of the Committee:

I wish to nominate my Ph.D. student, Ronald J. Smith, for the Black Trailblazers in Engineering program. Ronald is an outstanding scholar. I have never been associated with a graduate student who possesses such a keen ability to investigate technical literature about a relevant subject, find the key works, and then tackle the matter in a learned, scholarly pursuit. Ronald takes notes while he reads. He returns to advising conferences armed with questions and seeking guidance about where to concentrate his next efforts. He is an amazing individual, committed to academic pursuits.

Ronald switched fields for the Ph.D. His initial academic training, both as an undergraduate and at the Master's level, was in Agronomy. He has applied himself steadily to learning the conventions of engineering and technical thinking. He has spent significant time learning about the design process and how technologists and engineers look at problems in order to effectively communicate with his new colleagues. This effort has been one of the finest displays of professionalism and commitment to continuing education that I have seen in a graduate student.

Ronald's communication skills are superb. His written material conforms to the highest standards of technical communication, requiring very little editorial improvement. He has a strong publication record in his previous field, and he has now primed the pipeline to begin significant publications with ABE venues. I am expecting at least three completed journal articles before his graduation. His slide presentations and presence in front of a technical audience is well received. Following an ASABE Conference presentation, I had three peers comment positively on Ronald's presentation and how lucky I was to have recruited such an articulate and scholarly young man.

I really enjoy my professional discussions with Ronald, because he is a deep thinker, always asking 'Why?'. He looks for root causes and ultimate aims. He works diligently to engage with the big picture and thoroughly consider all impacts and





implications within a specific enterprise. This characteristic will serve to ensure that Ronald's future work always has impact and is relevant to society. I have worked very closely with this young man over the last few years, and I feel I understand his driving motivation. Ronald believes his contribution to humanity will be in improving the means by which we grow our subsistence. Nothing could be more noble or necessary.

Finally, I support this fellowship nomination, because I see incredible potential in this young man to teach and serve as an inspiration to others. He is a good man that wishes to perform good works. I can think of no better place for him than in an academic setting teaching other young people. Ronald will be a very approachable instructor and a practical teacher, and he has the potential to be an inspiration to others. I give this nomination my highest level of support. If anyone should wish to further discuss this young man's qualities or merit for this award, I would be happy to set a time to do so.

Respectfully yours,

Cobert M. Stwalley III

Robert M. Stwalley III, Ph.D., P.E. Assistant Clinical Professor of Agricultural & Biological Engineering Ronald J. Smith's Major Professor

