Learning by Doing: Reflections on the First Four Years of the Sustainable Agriculture Career Development Event

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Introduction

In recent decades, agricultural sustainability has taken the fore with producers, policy makers, and the public alike (Williams and Wise, 1997). Productivity gains are offset by the industry's dependance on environmentally degrading methods and production practices (Williams and Wise, 1997). Ground water depletion from excess irrigation is a concern for producers unable to meet crop water demand (Mitchell-McCallister et al., 2020). Prolonged use of chemical inputs such as fertilizers and pesticides poses health concerns to applicators (Williams and Wise, 1997). Aside from this, concerns over climatic conditions abound, with climate models indicating potential increases in severe weather events (Mitchell-McCallister et al., 2020).

With this backdrop, sustainable agriculture has emerged as a framework for environmental soundness, economic concerns, and quality of life (Agbaje et al., 2001). This field offers pathways for research, education, and employment. However, many of these practices are not being taught in school-based agricultural education (SBAE) programs, due to lack of educator expertise in this area (King, 2019). Innovative teaching methods are necessary to increase teacher preparedness and student participation in sustainable agriculture. The Sustainable Agriculture Career Development Event (CDE) is an educational innovation to help incentivize the integration of sustainable agriculture principles and practices into SBAE.

This competition provides SBAE teachers resources for instructing students in the field of sustainable agriculture and a framework for instruction. The Sustainable Agriculture CDE provides traditional and urban agricultural students alike an opportunity to demonstrate knowledge and skill in various areas of sustainable agriculture, as well as explore potential career opportunities. It was created, piloted, and is hosted by East Texas A&M University.

This project fulfills the AAAE research value related to advancing public knowledge of AFNR systems by incentivizing SBAE teachers to discuss an underrepresented niche of the agricultural industry with their students and future leaders in AFNR systems. This project fulfills AAAE research value realted to increasing prosperity through innovation in AFNR systems by educating future leaders in these areas to utilize practices that are ecologically sound, economically feasible, and ethically responsible.

How It Works

The Sustainable Agriculture CDE is modeled after other Texas FFA CDE contests. Teams consist of three or four individuals involved in school-based agricultural education programs. These teams compete by answering various test and problem-solving questions related to sustainable agriculture practices. The contest consists of 50 multiple-choice exam questions, 10 problem-solving activities, and 25 identification items. Students are given 50 minutes to complete the written exam, 30 minutes for problem-solving, and 30 minutes for identification. Each of the three sections is valued at 100 points each. There are 300 total points available for each individual, and 900 total points are available for each team. Team scores are calculated by adding together the three highest ranking individual scores from that team.

The written test consists of 50 multiple-choice questions to be completed in 50 minutes. These questions are derived from various sources related to sustainable agricultural practices. This aspect of the contest covers a wide array of best practices in sustainable agriculture including cover cropping, integrating livestock, weed management, and soil health.

The problem-solving section consists of 10 mathematics questions to be completed in 30 minutes. These questions follow a pre-set theme for each year and are provided in the study reference. The purpose of this section is to challenge students' knowledge and skills related to sustainable agricultural practices. These questions require interpretation, calculation, synthesis, and/or application of technical knowledge in a real-world context.

The identification section consists of 25 items selected from a predetermined list of tools, insects, weeds, and cover crops associated with sustainable agriculture in Texas. Contestants are provided a list of numbered items that may be used for identification.

Results to Date

From the years 2022-2025, there were, on average, approximately 7 teams competing in the Sustainable Agriculture CDE. Since its inception, we have seen participation in the Sustainable Agriculture CDE decline. In 2022, the pilot year of this competition, 13 teams competed. In 2023 and 2025, we had 5 teams compete. In 2024, only three teams participated.

Most teams (18) were from North Central Texas, and East Texas. Only two teams were from the East Central region. The furthest distance traveled to attend this competition was 274 miles; the shortest was 8 miles. Preliminary results indicate that the Sustainable Agriculture CDE is predominately viewed as a regional competition.

Future Plans

We aspire to increase participation in the Sustainable Agriculture CDE as this innovative teaching method diffuses across SBAE programs in Texas. We seek to communicate the relative advantage, trialability and observability of this competition through hosting various educational workshops over this CDE. A primary channel to achieve this end is to present this as a professional development opportunity for SBAE teachers both in-person and online. This will include a clinic and practice CDE for SBAE teachers at the summer professional development conference. Additionally, we aim to host several invitational Sustainable Agriculture CDEs with partnering high schools and community colleges. Finally, we seek to increase access to contest resources through launching a CDE informational webpage through East Texas A&M University.

Costs

One of the relative advantages of the Sustainable Agriculture CDE is the low cost associated with this competition. The contest resources, including rules, regulations, and study guides, are available from publicly held domains. As such, these tools are offered online free of charge to school-based agricultural education programs and students alike. The primary cost at the secondary level is practice time and collection of specimens for identification.

References

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