AG2PI SEED GRANT - PROJECT FINAL REPORT

PROJECT NAME	Seeding public-private partnerships for AG2P training

PROJECT PRINCIPAL INVESTIGATOR	TODAY'S DATE	PROJECT START DATE	DATE OF COMPLETION
Addie Thompson	5/25/23	5/15/21	12/31/22
TEAM MEMBERS (co-PI, co-I, personnel)		COLLABORATORS	
Tammy Long, Jyoshi Kumar, Anuradha Singh		Roundtable and/or module contributions and engagement: MSU IP/tech transfer office, Syngenta (two units), Bayer, Corteva, Weaver Popcorn Module expertise: Joe Gage, Zhou Zhang, Chinmay Soman, Thomas Aref, Erin Bunting, Robert Goodwin, Dave Douches, Joe Coombs, Arun Ross, Dirk Colbry One career panel: Chris Gottschalk, Sarah Potts, Francesco Cappai, Eli Hugghis, Jaime Willbur	

ACCOMPLISHMENTS

Please provide a short summary of the conclusions (both successes and failures) made from your project. Include a description of how this project will provide benefits to the agricultural genome to phenome community and, possibly, to a broader audience. You should include both qualitative and quantitative details, as necessary, to support your conclusions. Include a short accomplishment statement in non-technical language and do not include names.

This project succeeded in its goals of establishing ongoing relationships with industry groups, fostering public-private partnerships to benefit graduate students, and developing and implementing course modules leveraging these partnerships. Establishing these modules as public resources has proven more challenging, as we lack some of the expertise and resources in sharing large datasets, but we are still actively pursuing these goals. This project has contributed to the training of 39 graduate and undergraduate students at MSU, and we intend to expand this to other universities, organizations, and the public. One exciting outcome was the establishment of a teaching resource (for undergrads) developed within our data science course (grads), using data collected by undergrad biology students – this was develped into an RShiny module and is open for exploration. Over the course of time, our project drew involvement from experts in multiple state institutions and industry groups, across different crops in both outdoor and controlled environments. Engagement with the sweet corn breeding industry in our educational modules contributed to a successful sweet corn CAP grant to continue AG2P goals in the context of sweet corn field phenomics, modeling, and genetic mapping.

Products

Please list any products from this project. This may include (but not limited to) publication, concept/white paper, workshop, conference presentation, website, publicly available data or pipelines, etc. Reminder: you are required to make your prodcuts available to the broader stakeholder community using standard USDA practices, open source, FAIR, or other models. Metrics may include number of participants or times accessed, etc. Include links to recordings, DOI, etc. when possible. For presentations and posters, provide authors, date, location and presentation title.

ACTIVITY / PRODUCT	**DESCRIPTION (include URL, if applicable)**	**OUTCOME / METRICS**
Industry career discussions	Example career roundtable (Bayer gave us permission to record) https://mediaspace.msu.edu/media/1_e2enwrjw	Between 15-25 people attended each of 3 roundtable events
Course modules, with data and code	Public posting and URL forthcoming. We started hosting code here https://github.com/nrt-impacts/NRT-IMPACTS_Frontiers but have yet to update it with the recent modules, which are currently still housed with individual student/group github accounts, for example https://github.com/zhengjul/CSS844-m3-ML-DL-maize	Contributed to training of 39 students in computational plant sciences, as well as an additional set of undergrads in a computer science course taught by Arun Ross.
Educational publication on data science teaching approaches	In prep	
Tree phenology teaching resource	https://msu-phenology-project.shinyapps.io/PhenologyShiny/ This site was created in a graduate class, using data collected by an undergraduate class, in collaboration with the instructors and Tas to be geared at data visualization/analysis learning goals for the undergrad course	This module was used as a teaching tool for 500+ undergrad bio students in BS 162 "Organismal and Population Biology" in fall of 2022

Audience

With whom has this work been targeted to and shared? Please describe how this project and its products have been disseminated to a community of interest. Include any outreach activity or information sharing as well as training or professional development opportunities provided in this project.

This educational module partnership work was highlighted, with credit to AG2PI, in several invited and accepted talks. Because one of the goals of this project was engagement with the AG2P community, we emphasized presenting this work to broad audiences:

Brewbaker Lecture, University of Hawaii, Nov 2021 – university attendees
International Sweet Corn Development Association (ISCDA), Dec 2021 – public and private breeders
Corn Marketing Program of Michigan (CMPM) campus visit, March 2022 – farmers
FFA state convention, March 2022 – high school students and club advisors
MSU Genomics Symposium (GGS), May 2022 – university attendees
Genomics REU career talk, July 2022 – undergraduate researchers from across the US
International Society for Computational Biology (ISMB) Digital Agriculture at Scale panel, July 2022 – computational conference attendees
National Association of Plant Breeders (NAPB) conference, August 2022 – breeding conference attendees
MSU Engineering (ECE) faculty meeting, Nov 2022 – ECE faculty, invitation to participate/collaborate
Midwest Food Products Association Processing Crops Conference, Nov 2022 – food processing industry
Poster presented at AG2PI workshops 2022-23 and talk at mini conference 2022
Also presented at multistate project meetings for NC7 (germplasm resources) and NC1212 (phenomics)

CONTINUATION OF WORK

Next steps

How do you/your team plan to continue moving this project forward? Include how AG2PI can assist in your forward momentum.

We intend to publish some of this work in an educational journal. We also intend to make modules publicly available once we can figure out how to host data appropriately – we would be VERY open to suggestions and even collaborators on this front.
The course approaches are revamped and revised each year, and the topics and datasets change completely – we are always looking for new partners to increase our scope and reach – so, we are also very open to anyone wanting to contribute either datasets/issues or analysis expertise to current problems in the AG2P space.