

Research Applications for INnovation (RAIN) Grants

2022-23

A Commercialization Gateway Program

The College of Agricultural Sciences Entrepreneurship and Innovation Program is committed to fostering technology development and bringing research to the marketplace through the transfer of technologies to existing and start-up companies. RAIN is a source of competitive funds for researchers within the College of Agricultural Sciences who are prepared to take the next steps in transitioning technologies generated through their research to commercialization.

Goal

To create and advance Intellectual Property (IP) from the College of Agricultural Sciences towards commercial applications

Purpose

To provide financial support that will enable researchers to refine and strengthen technologies of promise and realize the commercial potential of ongoing research projects

Impact

To stimulate economic development through the transfer of technologies to the marketplace

Program Overview

RAIN grants help investigators to explore the feasibility of commercializing their research. For example, RAIN funds may be used to assist in overcoming hurdles faced in the process, to validate commercial application of a technology, or to strengthen the intellectual property position with further testing and data collection. These funds (up to \$50,000) are intended to establish proof of concept or demonstration of a technology. The RAIN program does not support basic research or research and development for existing commercial entities.

In addition, dedicated funds provided by the Charles R. and Ellen M. Krueger Research Applications for INnovation (RAIN) Grant Endowment are available to support a graduate student whose efforts are focused on research commercialization. These funds (up to \$25,000) may be used to support a graduate assistantship for one year (Grade 12, ½-time stipend, including fringe), research activities, or any combination of these expenses. First preference for all Krueger Endowment awards will be given to support RAIN projects with significant graduate student involvement to move toward commercialization. Applicants may apply to the Krueger Endowment for graduate student support only or apply for this funding in addition to other RAIN funding.

RAIN grant awardees receive program assistance from the College of Agricultural Sciences Entrepreneurship & Innovation initiative in the form of regular consultation and networking support provided by Maria Spencer, Assistant Clinical Professor and John and Patty Warehime Entrepreneur in Residence (mtk15@psu.edu) or Scott Welsh, Commercialization Manager (swwelsh@fieldstoneinnovations.com).

Application Process (two-phase)

Proposal Concept Note (200 words maximum)

A Proposal Concept Note summarizing the project is *strongly recommended but not required*.

The concept notes will be reviewed by the E&I Program Committee to provide feedback on project suitability and approach prior to submitting the full proposal. The components of the Proposal Narrative (see “Full Proposal Outline” below) can serve as a guideline when preparing the Proposal Concept Note.

- Proposal Concept Notes must be submitted via the web portal (linked below) to the Office of Research and Graduate Education by **5:00 pm on Tuesday, February 15, 2022**.
- Submit Applications through the Penn State InfoReady portal (must use Penn State login credentials): <https://psu.infoready4.com/#competitionDetail/1856473>

Full Proposal

- Full proposals must be submitted as a unified pdf to the Office of Research and Graduate Education via the InfoReady portal (linked below) by **midnight on Friday, April 1, 2022**.
- See below under “Full Proposal Outline” for details on the required components of the proposal narrative. Please use this structure for your proposal narrative.
- Applicants who submitted a Concept Note will receive email notification of the conversion of their concept note into a full proposal draft in InfoReady. The full proposal application portal will open for all applicants on February 21, 2022: <https://psu.infoready4.com/#competitionDetail/1856473>

Full Proposal Outline

I. Title, Principal Investigator

II. Proposal Narrative (5 pages maximum)

- Background – *summarize the research progress to date, including a clear statement of the problem and the market opportunity the research is addressing.*
- Technology development plan – *outline the proposed project scope for developing your technology towards commercialization, including TRL levels at the beginning and end (anticipated) of the project, milestones, and a schedule of deliverables for each quarter. Identify the link between proposed research and commercial application. (Read more below under, “Evaluation Criteria”)*
- Commercialization gateway plan – *outline a business model describing the overall strategy to commercialize the technology both during and after the funding period using the questions in Appendix 2 as guidance. (Read more below under, “Evaluation Criteria”)*
- Krueger Endowment Applicants – *describe graduate student activities and participation in the project, detailing how students are expected to have significant involvement with the project and opportunity to develop and reflect upon their own learning, innovative skill development, and future potential*

III. References

IV. Budget (1 page) plus justification

- Projects are limited to one year of funding (no extensions or carryover permitted), although subsequent RAIN applications to advance the technology can be submitted.
- If funding is requested for graduate student stipend or tuition, only graduate students advised by College of Agricultural Sciences faculty are eligible.
- Supplemental salary is not permitted.
- Project budgets *up to* \$50,000 total costs will be considered for RAIN Grant awards and *up to* \$25,000 total costs will be considered for Krueger Endowment awards.
- Provide a summary budget in the following format:

Category	07/01/2022 – 06/30/2023
Personnel (including fringe) – Name and/or position	
Material and supplies	
Travel	
Equipment	
Purchasing services	
Other	

- Provide a justification (description and explanation of need) for each category in the summary budget.

VI. Addenda (optional - 5 pages maximum)

- Gantt chart, figures, tables, schematics, diagrams, etc.
- Industry partner - letter of interest or collaboration (not required for funding)

Evaluation Process

Proposals will be evaluated through a combination of scientific merit and commercialization potential reviews.

- Proposals will be evaluated on their scientific merit by a minimum of two reviewers.
- Proposals will be evaluated on their commercialization potential by a minimum of two reviewers.
- Scoring of proposals will be on a 200-point scale based on scientific merit and commercialization potential (100 points for each), which will include relevancy of proposed scope to key commercial issues.
- Funds will be allocated by the Office of Research and Graduate Education based on reviewer recommendations and final review by the Associate Dean for Research and Graduate Education.
- Award notices will be made by the end of May, with a period of performance from **July 1, 2022, to June 30, 2023.**

Evaluation Criteria

Successful applications must demonstrate that funding will significantly advance research projects toward a commercial product or process. The *Technology Development Plan* should describe the proposed work to be performed to advance the technology toward commercialization. Technology Readiness Levels will serve as the primary tool to assess progress toward a viable product (see Appendix 1). RAIN program targets projects with TRL 4-7, but to be considered must be TRL 3 or greater at the beginning of the project and show advancement to a higher TRL level. A discussion of how the proposed Technology Development Plan addresses key commercial questions should be included.

The *Commercialization Gateway Plan* is a brief business model that describes how the research team creates, delivers, and captures value from a technology. The plan should provide the overall strategy to commercialize the technology both during and after the funding period (see Appendix 2 for recommended topics). While applicants are not expected to have a detailed business plan at this stage, the proposal should demonstrate an understanding of issues that relate to commercial relevancy.

During the funding period, the E&I Program will assist grantees in engaging appropriate mentors, provide commercialization training opportunities, and aid in establishing industry partnerships. Awardees are expected to file an Invention Disclosure with the Penn State Office of Technology Management during the first quarter of the project if a disclosure was not filed previously.

For questions regarding commercialization of research, please contact Maria Spencer (mtk15@psu.edu) or Scott Welsh (swwelsh@fieldstoneinnovations.com).

Reporting

- All reports should summarize progress toward commercialization, advancement of the deliverables, expenditure projections, and status of industry or other partnerships.
- Awardees are expected to provide quarterly progress reports during the funding period (solicited through the InfoReady system) and may be asked to present their work to the E&I Advisory Board, which meets twice a year.
- The final report to the Office of Research and Graduate Education will be due **August 15, 2023** (solicited through the InfoReady system).

Appendix 1: Technology Readiness Levels

Technology Readiness Level	Stage of Development
Basic Research through Feasibility	
TRL 1.	Basic Research Stage - Basic principles are observed and reported. Scientific knowledge generated underpinning the technology concepts or applications.
TRL 2.	Invention Begins - Practical applications can be invented but are speculative and there may be no proof or detailed analysis to support the assumptions.
TRL 3.	R&D Initiated - Analytical and laboratory studies to physically validate analytical predictions of separate elements of the technology that are not yet integrated.
Technology Development and Demonstration	
TRL 4.	Basic technological components are integrated to establish that the pieces will work together.
TRL 5.	Basic technological components are integrated so it can be tested in a simulated environment.
TRL 6.	Model/prototype is tested in relevant environment such as a high-fidelity laboratory environment or in simulated operational environment.
Technology Validation and Implementation	
TRL 7.	Demonstration of an actual system prototype in an operational environment.
TRL 8.	Technology is proven to work - Actual technology completed and qualified through test and demonstration.
TRL 9.	Application of technology in its final form - Technology proven through successful operations.

Adapted from: "*Technology Readiness Assessment Guide* (DOE G 413.3-4)". United States Department of Energy, Office of Management. October 12, 2009.

Appendix 2: Commercialization Gateway Plan

Key Points to Describe the Business Model
Describe the product or process that will be developed from this technology.
What are the primary markets that you are hoping to target with this innovative product or process?
How do you envision that this product or process will get to market (i.e licensing, start-up)?
Are there existing companies that are offering competitive products or processes? If so, what is the competitive advantage of your product?
Has this technology been patented or protected, and if yes, who is the technology owner?
Describe any partnerships or other relationships that might impact the commercial development of your product.
Describe any specific interest in the technology from industry. What steps have been or will be taken to get industry feedback?