IGEM Grant Report

☐ Progress (due January 1) X Annual (due July 31) ☐ Final (due August 31)

IGEM Grant #: IGEM26-009 Principal Investigator: Daniel Robertson

Name/Full Title of Project: Driving Idaho's Energy and Agricultural Economy via High-Throughput Phenotyping of Biofuel Feedstocks and Grains

Submission Date: Feb 28, 2025 Primary Institution: University of Idaho

Section 1: Project and its goals

- Advance the Technology Readiness Level of two electromechanical devices for measuring biomechanical plant attributes related to crop lodging resistance and move the devices towards commercialization. The two devices are:
  - Device for Assessing Resistance to Lodging IN Grains (DARLING).
  - Strength of Crop Extrapolation Machine (SOCEM).

Section 2: Summary of accomplishments and future plans

- Lowered manufacturing cost and secured supply chain of both devices.
- Continue to build out product families for each device to make them available at multiple price points.
- Improved packaging and shipping cases for DARLING.
- Devices being used in Georgia, Israel and Texas. Design improvements and field validation will continue.

Section 3: Summary of budget expenditures

- Salary, Fringe, and Materials and supplies funds have been expended or encumbered and budget is on track.

Section 4: Economic development/impact

- 1 new research group is using devices.
- 1 US patent was awarded.
- Plans to launch a startup company in Year 2. Will travel to present devices at tradeshows and conferences in Year 2.

Section 5: Participants

- 1 faculty and 3 students in Idaho.
- 4 faculty and 6 students in other jurisdictions.
- Starting next year as part of a new NSF award approximately 12 new faculty, 3 postdocs, and 12 students will be using the devices in field trials.
- Students are making improvements to device hardware and software and using devices in the field while faculty are overseeing trials and design efforts.

Section 6: Long-term sustainability plan

- Awarded $75,000 to continue developing devices from M.J. Murdock Charitable Trust.
- Awarded $6 million from NSF. Part of the award is focused on moving devices towards full automation and integration into plot combine harvesters.
- Continue to receive new requests by other researchers to use / purchase devices.
- Currently evaluating patent defensibility as a closely related journal article predating one of the awarded patents was recently discovered.
- Determined the most viable commercialization option is for a startup to manufacture devices in-house. Only the printed circuit board will be outsourced. Currently making design improvements to ensure devices can be manufactured with minimal capital equipment investment.

Section 7: Expenditure Report

Category	Year 1 Request	Year 1 Expenditures
Salary + Fringe	$50,833	$50,085
Travel	$5,156	$5,156
Materials	$12,200	$11,901
Total	**$68,189**	**$67,143**

Metric	Status
Time Elapsed	100%
Funds Expended	99%
Overall Health	**On Track**

The above budget numbers represent expenses from July 1, 2025 through June 30, 2026. The project budget is on track.