

Nebraska Soybean Board



11/8/2019

Year-End Summary Research Report Form For Multi-Year Projects

Please use this form to summarize the practical benefits of your research project and what has been accomplished.

Your answers need to convey why the project is important and how the results impact soybean production.

Note that this form must be submitted with the 4th Quarter Report in all multi-year projects.

Project Title: Enhancing soybean germplasm through biotechnology

Principal Investigator: Tom Clemente

' U ' : of (For example: Year 1 of 3, Year 2 of 2)

1. What was the focus of the research project or educational activity?

This program is employing the tools of biotechnology to add novel bits of genetic variation to soybean targeting various input and output traits

2. What are the major findings of the research or impacts of the educational activity?

This program is recently communicated on, and captured intellectual property on, an unexpected finding that a transcription factor from the model plant species *Arabidopsis*, when expressed in seed of soybean translates to significant increases in palmitic acid in the oil. What was learned from this outcome was used to build genetic elements that have led to the development of a soybean oil, high in saturated fatty acids (stearic, coupled with wild type levels of palmitate and elevated oleic acid). This oil has applications in food and industrial applications.

The second major development was the testing of a multi-transgene stack (8), that led to the synthesis of a high value carotenoid (astaxanthin), a very long chain omega-3 fatty acid (EPA) and form of Vit E (tocotrienol). Such an oil has utility in aquaculture feed formulations.

3. Briefly summarize, in lay terms, the impact your findings have had, or will have, on improving the productivity of soybeans in Nebraska and the U.S.

This program is testing novel genetic variation in soybean that hold potential to improve water use efficiency in the crop, and add value to the harvest through the synthesis of unique co-products in the oil reserves, without impacting protein quality or quantity.

4. Describe how your findings have been (or soon will be) distributed to (a) farmers and (b) public researchers. List specific publications, websites, press releases, etc.

The research outcomes from this program are being communicated in scientific journals, and conferences, along with direct outreach to the public at large through presentations by PI Clemente

5. Did the NE soybean checkoff funding of your project, leverage additional State or Federal funding support? Please list sources and dollars approved.

This program is receiving additional support from the United Soybean Board, and in-king contributions by Impossible Foods.

Please e-mail this report to the Agriculture Research Division (jmonagham2@unl.edu).