

Nebraska Soybean Board
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 will impact soybean production.

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

Project # and Title: #705: Improving Water Use Efficacy in Soybean

Principal Investigator: Glowacka

Year of Multi Year: 2 of 3 (example: Year 1 of 3, Year 2 of 2)

1. What was the focus of the research project?

The focus of this year project was to evaluate the effect of overexpression of photosystem II subunit S, the photosynthesis-related protein, on the growth of soybean in the greenhouse and field under well-watered and water-limited conditions.

2. What are the major findings of the research?

The main findings of the research this year are that: (1) overexpression of photosystem II subunit S in response to stress conditions increases the photoprotection (2) under hot and dry conditions more photosystem II subunit S increases soybean growth in the vegetative stage (bigger leaf area, higher stem, higher dry weight of leaves and stem) (3) under the hot and dry conditions more PsbS increases soybean seed size however more analyzes on yield traits such as weight of 100 seeds; the number of pots and seeds per plant are under development.

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.

The preliminary results collected this year in the greenhouse and field suggest that by increasing the amount of soybean PsbS protein under the combination of drought, heat and high light conditions the growth and yield can be improved. That finding can have a huge impact on soybean production in Nebraska since only about half of the fields of soybean in the state are irrigated and severe drought is one of the main reasons for yield diminish.

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.

Collected this year data have not been published yet nor communicated to the public. Since our field plots were relatively small due to limited seed numbers which can be produced by a transgenic single plant in greenhouse conditions. Before communicating our results to the public we want to confirm our exciting findings by performing field experiment next year. In 2023, we plan to establish a bigger size of the plots and a higher number of plots utilizing transgenic seeds collected from the 2022 field experiment.

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

NO

Please submit this completed form to the Agriculture Research Division, jmcmahon10@unl.edu, based on the reporting schedule given to you. If you have any questions, please call Jen McMahon at the Agricultural Research Division (402) 472-7082.

Please check your information before submitting the form.

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