

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: Creating Five High-Yield Soybean Variety Pairs with Contrasting Biological Nitrogen Fixation Capabilities

Principal Investigator: George Graef

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

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

To understand the contributions of Biological Nitrogen Fixation (BNF) and nitrate availability (soil residual or fertilizer) used by modern high-yielding varieties in maturity groups 0, I, II, III and IV. This is done by developing isolines carrying the mutant non root-nodule phenotype that can be compared to their normal root-nodulating counterparts.

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

A major deliverable from this work is the development genetic tools in the form of current high-yielding isolines in maturity groups 0, I, II, III and IV carrying the mutant non-nodulating phenotype. Each set of line pairs that we develop will have identical background genetics, but differ for the *rj1/Rj1* alleles at the *Rj1* locus. The *Rj1Rj1* normal lines can form nodules, and the *rj1rj1* lines cannot. These newly developed tools can be used by soybean researchers to help answer questions related to soybean nitrogen use and yield.

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.

Producers need to know how to maximize the yield of modern soybean varieties. One step towards that goal is to identify optimal N-uptake routes, whether it is via BNF, applied soil nitrate, or some combination of both.

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 developed isolines will be available to soybean breeders, physiologists, agronomists and other researchers upon request. In addition, development details will be documented and publishes, and seeds from each isoline will be submitted to the USDA National Germplasm Resources Laboratory (NGRL) and the Germplasm Resources Information Network (GRIN) for characterization, conservation and future availability and distribution.

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

Please email 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 ARD 2-7082.