Nebraska Soybean Board
Year-End Research Findings Report

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.

Project Title: ***Benchmarking soybean production systems in Nebraska (#90005)***

Contractor & Principal Investigator: ***UNL–Department of Agronomy. PI: Patricio Grassini***

Please check/fill in appropriate box: ☐ ***Continuation research project***
☐ ***Year _1_ of _2_ research project (for example: Year 1 of 2)***

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

The primary goal of the proposed project is to "benchmark" current yield and management practices in producer fields. This project is a sub-component of a larger, regional 10-state benchmarking project led by PI Grassini and supported by the North Central Soybean Research Program (NCSRP). NSB funding contributed to data collection in Nebraska.

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

We partnered with 20 UNL Extension Educators and NE Natural Resources Districts (NRDs) to collect the data. The number of filled surveys collected by UNL Extension Educators, together with the surveys filled out by NRD soybean producers, sum up to 414 soybean fields in 2014 and 483 soybean fields in 2015 (total of 897). Note that the number of surveyed fields almost doubled the target number (480 fields) set at the beginning of the project. Relative to other states that participate in the NCSRP-funded project, the largest number of survey forms was collected from Nebraska thanks to the help of Nebraska Extension and NRDs and the support from the NSB (see attached TECHNICAL REPORT). So, we are very happy on how well the collaboration with UNL extension and NRD worked out and we look forward to collecting the data following the same model during the next winter! The core team at UNL have inputted, quality control, and archived the data collected by Extension Educators, NRDs, etc. in a digital database. Weather and soil data were retrieved for each individual field, which will allows proper contextualization of the collected data. A detailed report summarizing the collected data has been prepared (see attached TECHNICAL REPORT). Interesting findings based on 2014-2015 data are:

- ***Nebraska average dryland and irrigated yields were 56 bu/ac and 67 bu/ac respectively, both above the average soybean yield in the north-central region (54 bu/ac). Only a small proportion of producers (2%) attained soybean yields near or above 80 bu/ac.***
- ***Half of the soybean area in the north-central region is no-till. Adoption of no-till in Nebraska is greater in dryland (77% of fields) than in irrigated fields (51% of fields).***
- ***About 25% of soybean fields in this region are planted during the first week of May or earlier. This figure rises to 45% in Nebraska.***
- ***Seeding rates used by producers are well above economically optimal soybean seeding rates, which, in the case of Nebraska, is 120,000 seeds/acre.***
- ***Most producers in the region grow soybean at a 15-inch row spacing, except for Nebraska and eastern Iowa where 30-inch spacing still prevails.***
- ***Across the entire north-central region, 8%, 19% and 24% of soybean fields are treated with foliar fungicide only, insecticide only, and both fungicide and insecticide, respectively. In Nebraska, these figures are lower at 6%, 3% and 17%.***
- ***About 15%, 54% and 54% of fields in the north-central region received starter, phosphorous, and potassium fertilizer, respectively. In Nebraska, these figures are 15%, 70%, and 54%***

*****This form must be completed and submitted with the fourth quarter report.***

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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.

We have compiled the most extensive, detailed, and agronomically-relevant database on soybean production systems in USA and worldwide. For first time, it is possible to examine spatial variation (across and within states) in soybean yield and management practices. This information will be very useful at determining the factors that can help increase soybean yield, input-use efficiency, or both in producer fields in Nebraska and the rest of the US north-central region and, in doing so, increase on-farm net profit. During the second year (2017), we will focus on data analysis, although we will still collect data from producers fields planted with soybean in 2016.

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.

A summary report was prepared and posted in the North Central Soybean Research Program website (http://www.soybeanresearchinfo.com/index.php?id=57 -- SEE APPENDED TECHNICAL REPORT) and also published as a UNL CropWatch article (http://cropwatch.unl.edu/2016/help-us-identify-limiting-factors-nebraska-soybean-fields) and made accessible to all NE soybean producers. The report was also shared with educators, NRDs, NSB members, etc. Likewise, a scientific paper about selection of weather data sources used for this project was published in the European Journal of Agronomy (Moutziniss et al., In Press), one of the most prestigious peer-review journals in agronomy:

Mourtzinis S, Rattalino Edreira JI, Conley SP, Grassini P (2016) From grid to field: assessing quality of gridded weather data for agricultural applications. European J. of Agronomy (In Press).

Likewise, Patricio Grassini (Project PI) will give a presentation at the 2017 winter UNL Crop Production Clinics at 8 locations in NE, which will include results from Year 1 of this project. Also, Juan Ignacio Rattalino Edreira (Post-Doctoral Research Associate working on this project) will present results from this project at the 2016 Annual ASA/CSSA/SSSA Meetings at Phoenix AZ.

5. Did the NE soybean checkoff funding support for your project leverage any additional state or Federal funding support? (Please list sources and dollars approved.)

The NSB funding helped us to secure funding from North Central Soybean Research Program (NCSRP) to continue the regional (10-state) benchmarking project for another year (and possibly a third year North Central Soybean Research Program (NCSRP), at a total level of 1.5 million (total for the 3 years). Patricio Grassini is the PI of the funded NCSRP project.

SEE APPENDED TECHNICAL REPORT.

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