**KEY:

Reviewer Text
Response to questions/input
Text that already appears in the document
New Text Added**

Reviewer(s)' Comments to Author:

Reviewer: 1

Comments to the Author
Well done on your paper. I have included a track changes Word copy with some edits that you should consider, but do not constitute a minor revision in my opinion. Your paper puts forth an excellent argument to the abandonment of yield goal in favor of a more modern approach to nutrient management.

Reviewer: 2

Comments to the Author
This MS examines the usefulness of yield goal predictions based on previous years’ wheat yield. I think this topic is very relevant because often times farmers are told to base N application rates on the yield goal using previous years’ yields and it’s good to actually examine how useful this method is. The three long-term studies analyzed in this research provide a lot of data and good foundation to examine yield goal predictions. Specific comments are listed below:

Title- I suggest coming up with a more descriptive title.

Title changed to Can Yield Goals Be Predicted?

Pg 1, line 10- Does “this work” apply to all three of the referenced experiments- Magruder, 222, and 502? Or is “this work” in reference to the manuscript itself? I think it’s referring to the specific research in the MS, but probably wouldn’t hurt to clarify in the text.

Clarified to “this manuscript”

Abstract- Since the yield goal concept to predict current-year yield is unpredictable, is there an alternative method the authors can suggest? What is the recommendation for growers as a result of this research?

On page 9, added discussion was included that delineated the need for mid-season prediction of yield potential that several have found to be of value. We did not include this in the ‘abstract’ because it was not a finding of this paper. With your approval, a short sentence has now been added.

Furthermore, these findings elucidate the importance of using better methods to predict yield potential (replacement for yield goals), and that is possible using mid-season active sensor data (Raun et al., 2001; Teal et al., 2006; Girma et al., 2006). This non-destructive methodology using active sensors, that can be used day or night, is commercially available and has delivered increased profits for wheat and maize producers (Scharf et al., 2011). This approach has also resulted in more accurate prediction of agronomic optimum N rates compared to yield goal/soil test based methods (Bushong et al., 2016).

The use of mid-season prediction of yield potential using active sensors is a viable alternative for improved in-season cereal fertilizer N recommendations.

Pg 3, line 65- It’s unclear to me what is meant by University Extension (e.g., soil testing).

The literature review in this paper covers the historic value/use of yield goals. We added “historic” to better communicate as much and so as to tie the two together.

Pg 9, lines 214-215 through Page 10, lines 216-219- Since the yield goal prediction method wasn’t found to work, it would be nice for the authors to expand a little bit more here to discuss other potential methods that may be more accurate. Has mid-season active sensor data been collected on the long-term studies? It would be interesting to compare sensor predictions to yield goal predictions from the same plots.

This is an excellent point. We did cite papers that employed these same long-term experiments and where mid-season sensor readings were used to predict yield potential. This work and others showing the benefits of as much have now been added and cited.

Added studies have used algorithms that employ mid-season sensor readings for predicting yield potential and have resulted in refined fertilizer N rates (Singh et al., 2011; Solie et al., 2012; Crain et al., 2012).

Associate Editor: 1
Comments to the Author:
See comments from two Reviewers..
Reviewer 1 provided an annotated MS.

corrections made

additional comments from TE.

P1 Title. Add a more descriptive title.

The word failure was added

P1 L3. Delete ‘nitrogen’ – elements in the periodic table can be abbreviated without requiring to be defined.
P1 L7. Add a comma after “1969-present)”

P1 L8 add a comma after ‘45’
P1 L9. Suggest you revise this sentence.. statistics were developed earlier than 1930. Its sufficient to state the plots were not replicated.. the reason provided is speculative. Later in the Methods you state these plots were established in 1892, but it appears in Abstract they were established in 1930.

They were established in 1892. Only data from 1930 on were used for this analysis. This is further clarified.

P1 L11 (also L15, and elsewhere in text). Write numbers in full (unless units are abbreviated); i.e. “three to five years”, or “3 to 5 yr”, not “3 to 5 years”

Correction made

P1 L12. Avoid the possessive.. “predict yield of the ensuing year, or yield goal.”
P1 L13 (and elsewhere in text). Use upper case “Treatments” – this is a proper noun.
Correction made

P1 Add a list of abbreviations to follow the Abstract. Add MRTN, NDSU, NDVI, NUE, RI
P2 L45. Make the abbreviation ‘NDSU’ – to fit subsequent use. Add to a list of abbreviations to follow the Abstract. Revise this sentence.. its colloquial to state that “NDSU.. employs yield goals”, it’s the faculty/staff using the yield goals.. not the university.

Suggest “North Dakota State University (NDSU) Extension Service had recommended that the yield goal could be the best achievable yield in the last four to five years and that is usually 30 to 33% higher than the average yield. Nonetheless, this has been updated to reflect that NDSU faculty and staff no longer employ yield goals in any of the crops for which they make N fertilizer recommendations (Dave Franzen, NDSU, personal communication, February 2017).”

P3 L51. Add NUE to the list of abbreviations.
P3 L68. Add NDVI to the list of abbreviations.
P4 L73. Add RI to the list of abbreviations.
P3 L77. Add MTRN to the list of abbreviations.
P4 L76. Replace ‘and’ with a semi-colon
P4 L78. Add the Latin name for maize

Completed

P4 L81-82 (also L204). Multiple citations should be in chronological, not alphabetical, order
P5 L103. Delete “(Triticum aestivum L.)”.. Latin names given in the Abstract do not need to be repeated.

P5 L111. Clarify the fertilizer used.. I understood potash was “(0-0-60)”

SI values are used throughout (N, P K). P2O5 or K2O values were not used. K value would be (0.83\*60) (%K in K2O) and equal to 50. P is 0.436 (% P in P2O5)

P5 L115. Write in full, ‘six’, not ‘6’
P5 L117. Use past tense ‘were’, not ‘are’
P6 L136. Use singular, because you’re referring to a single yield. Suggest “For each trial, grain yield was averaged over the prior three, four, or five year periods, for all treatments delineated, and a linear regression model developed relating those yields to yield in the ensuing years.”

Thank you for these corrections. For this study, because 3, 4, and 5 are so important in terms of what was done, use of the numerals is preferred, because they stand out.

P6 L143. Suggest “The last three-year sequence…”
P7 L150 write in full “(two treatments)”

P7 L156. Use past tense ‘were’, not ‘are’
P7 L162. Delete ‘have’

Deleted

P7 L163-165. Poor sentence.. excessive words. Suggest to simplify.

Completed

P8 L158. You are describing a hypothesis (not an assumption). Suggest to replace ‘assumption’, with ‘hypothesis’
P8 L186. Use past tense ‘indicated’
P8 L189. Use past tense ‘was’, not ‘is’
P9 L209. Replace ‘like’, with ‘such as’

Table 1. Check the NPK values you give are actually N-P-K, and not N-P2O5-K2O. Earlier in your paper you also give NPK values for fertilizers used, and those values appear to be P2O5 & K2O values.

No P205 or K20 values were used. There was a mistake in Table 1 listing KCl as 60%K instead of 52.

Table 2. Give the geographical coordinates as degrees and minutes (i.e. no decimals). Include the elevation to better inform the readers.

Decimals are used so as to arrive at actual locations, especially for Magruder and 222 that are so close. Elevation added for the two sites (Stillwater and Lahoma)

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