**Key:**
Editor/Reviewer Comments
Author Response
Correction made

Reviewer 1 has provided an annotated script where there are some queries that you need to deal with.

Changes requested are now included in the modified manuscript attached.

My reason for returning your script without editing it first is that reviewer 2 has raised some important issues about background to this work. Given that the readership of the Journal has a wide knowledge based this reviewer's concerns are very important. I am sure that you will not have any difficulty in meeting the suggestions made for improvement.

Requested changes have been made and clarification added for long-term trials

Your paper is not inordinately long and there is no reason for you not to take more space to provide information on the concepts and premises of this work.

At present you do not have a conclusion. This should not be lengthy and should not be a summary of what you have done in the paper, but simply the outcomes of the research.

Brief conclusion added as per this suggestion

Please ensure that you follow the Journal's style of references when you revise your paper as this will avoid delays in the editorial process.

References modified

**Reviewer #2 (comments taken from the article where his/her comments were attached)**

 In order to provide the full picture, also investigations should be mentioned that have shown that yield prediction based on canopy reflectance measurements can have some limitations. Under European conditions, researchers have frequently reported that correlations between canopy reflectance and final yield improve during the growth period, allowing for accurate yield prediction at later growth stages but being fairly uncertain at early growth stages when decisions on fertilizer topdressing have to be made.

The reviewer makes an excellent point and that is now clarified in the text where the Lukina et al. (2001) was first referenced. Added text noted “But, improved prediction of yield was found when later season readings were used.”

It seems as if the experiment numbers are mixed up here. According to Table 1, the relationship was significant for Experiment 222 and not (or marginal) significant for Experiment 502.

Sorry for the mistake. The reviewer is correct and the text has been modified.

Just a remark: Isn't it likely that this small overall-increase in responsiveness could be due to the fact that the trial plots have been permanent from year to year - with the consequence of a slight decrease of organic N content and yield potential in the zero N plots?

Excellent point. Clarification added to reflect your observation. “This small overall increase in responsiveness could be due to these being long-term plots where N depletion would be expected in the 0-N check.”

To me, this sort of 'conventional wisdom' is barely understandable. Isn't a N response even more unlikely in case of fertilizer application without N response in the previous year, and provided that the applied fertilizer hasn't got lost completely? (at least in a setup with non-permanent plots?)

The reviewer makes a good point as this paragraph was confusing. We have attempted to clarify this with the following modified text. “In several 2 year sequences at Experiment 222, high (>1.5)One year with a low RIHarvest or N responsiveness was seen in ensuing years. Similarly, low N responsiveness two years in a row was seen (Figure 9). Combined these two observations speak to the unpredictability of N responsiveness with time. “

To my understanding this is some misperception of the sufficiency index concept based on chlorophyll meter readings. Measuring the chlorophyll concentration (or, indirectly, the N content), the nitrogen nutrition status of the crop, as a result of the N supply from the soil and the crop response to available N as well as to other growth conditions, is detected. N deficiencies become visible, in fact almost independent of the yield that is achievable in the respective season.

Published sufficiency approaches do not partition predicted yield level from N responsiveness. The exact same sufficiency level could be detected for both low and high yielding crop production environments, yet the same fertilizer N rate would be recommended. This approach while useful, has this weakness.

Reviewer #1: Dear Authors,
The paper is well written and consistent.
A few minor comments and remarks are included in the draft attached. Most of those comments are meant as suggestions for some reconsideration and do not indicate an absolute need for revision.

Corrections now included in the modified manuscript.

Reviewer #3: The authors of this manuscript presuppose readers will understand the concepts and the agenda behind it. This is not necessarily true. I found it confusing and poorly documented as to the basic premises. Older long-term data is used, which may or may not be appropriate when debating this issue. The authors need to approach their premises as if no prior knowledge is present in the reader, and justify and explain their concepts more fully. This needs to be rewritten. This reviewer is aware of some of the previous work but even with this knowledge, the manuscript and use of the chosen data is not convincing.

The abstract was completely reworked to better communicate the problem at hand and the importance of demonstrating the independence of yield potential and N responsiveness. This is also included in a re-vamped conclusion section. Data from the long-term corn experiment at Mead, NE (1969-1983) remains relevant because this was a basic N rate trial. While actual yield levels might be higher now with improved hybrids, there is no basis to believe that that the relationships (N responsiveness versus yield level) would be different. Long-term trials are becoming a thing of the past, thus, finding reliable data has become more and more difficult.