



SDI Review Form 1.6

Journal Name:	Asian Journal of Soil Science and Plant Nutrition
Manuscript Number:	Ms_AJSSPN_43886
Title of the Manuscript:	Predicting Maize Performance Using Normalized Difference Vegetation Index and Nitrogen Application
Type of the Article	Original Research Article

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This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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SDI Review Form 1.6

PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<u>Compulsory</u> REVISION comments	This manuscript represents experiments of moderate quality but of low value. The discussion section is written like a report rather than an explanation and description of relevance of the results. How relevant are these results? It seems that it would be more relevant to test the applicability of the Magdoff soil nitrate test. Blackmer et al found using 900-year test data (multiple years, and sites) that 80% of maize grain yield could be predicted using this test. The NDVI, based on your one year and one location, is less than 50% predictive. What were the developmental stages (V1 through Vn where n is the number of fully expanded leaves, TS – tassel shed, R1-silking, etc.) Heating degree days should be used instead of chronological ordering of days so comparisons can be made across locations and years. How was the cob harvest index calculated? From you M&M section the cob harvest index is the cob weight divided by the plant biomass x 100. Similarly, the grain harvest index is the 15% moisture grain weight divided by the plant biomass x 100. If this is true then the plant biomass should be calculated using the cob weight and cob weight harvest index or by using the grain weight and the grain harvest index. If the grand mean of grain yield is 6847.918 kg ha⁻¹ and the grand mean grain harvest index is 34.405 then the biomass should be 100 x (6847.918/34.405) = 19,903.845kg ha⁻¹. If the same calculation is made using cob harvest	It was stated in the M & M that the harvest index of cob (HIC) was calculated by dividing the cob weight by the total biomass weight while the harvest index of grain was calculated by dividing the grain weight by the total biomass although the biomass data is not shown. If this is true then the biomass should be derived from either the cob harvest index and the cob weight or from the grain harvest index and the grain weight but you don't get the same result. 100 x (6847.918 (grain weight)/34.405(grain HI)) = 19,903.845kg ha⁻¹(Total biomass) 100 x (499.349kg ha⁻¹(cob weight/ 42.903(cob harvest index)) = 1163.902 kg ha⁻¹(Total biomass) Also, it should be noted that the N-levels are experiment treatment while the NDVI measure are measured parameters. What does this have to do with anything? Of course, N levels are treatments and NDVI are measurements.



SDI Review Form 1.6

	index grand mean and the cob weight grand mean a different biomass is calculated - $100 \times (499.349\text{kg ha}^{-1} / 42.903) = 1163.902 \text{ kg ha}^{-1}$. Since you had to measure plant biomass to calculate harvest indices why did you not correlate NDVI to plant biomass? If NDVI is an estimate of the biomass why not correlate NDVI to biomass and then biomass to yield. NDVI 3-weeks is better correlated to biomass ($r^2 = 0.428$) than NDVI 4-weeks ($r^2 = 0.301$) but NDVI 4-week is better correlated to grain yield ($r^2 = 0.23$) than NDVI 3-week ($r^2 = 0.13$) so there is some disconnect or the correlation coefficients are not very useful. Biomass is better correlated to grain yield than any of the NDVI measurements ($r^2=0.529$). Are you trying to force a relationship between NVDI and grain yield? Biomass seems to be better than any of the NDVI measurements and the NDVI measurements seem to be of little value since they can only account for less than 50% of the variation associated with grain yield. Your tables should have the F values from analysis of variance for the N, cultivar and N x cultivar interaction. <table><tr><td>Factor</td><td>P > F</td></tr><tr><td>N</td><td>0.01</td></tr><tr><td>Cultivar</td><td>0.01</td></tr><tr><td>N x Cultivar</td><td>0.34</td></tr></table> What is the significance level of the LSD you are using? (LSD(0.01), LSD(0.05), etc. Is the LSD protected by a significant F value? Try doing the correlations with the means rather than with the raw data. The raw data includes variation due to replication which will lower the correlation coefficients. The effect replicate has on the relationships is irrelevant.	Factor	P > F	N	0.01	Cultivar	0.01	N x Cultivar	0.34	We did not correlate NDVI to plant biomass because NDVI is a measure of the plant biomass at the early stages of the crop growth (2, 3 and 4 WAP) Again what plant stage is 2,3,4 WAP in V stages? hence correlating these two together is not the aim of this study. The aim was to utilize the biomass measured with the green seeker (a biomass measuring device) as stated in the M&M to predict the eventual grain yield from different varieties; The correlation between NDVI and grain yield ($r^2 = 0.23$) were worse that a coin flip (0.5). Why would anyone use this measurement when they could get equal or better prediction from a coin flip? that was why the most correlated out of the biomass measures (NDVI 4 WAP) was thereby regressed against grain yield to determine the linear equation linking them. More so, grain yield is the eventual target of these hybrids, hence the decision to correlate NDVI against grain yield. The LSD values for each of the experimental factor included (LSD N; LSD VAR and LSD N x V) was used to compared the means of each among the hybrids and the N levels. It informs if the highest value as observed was significantly higher or just numerically higher; But without a significant overall treatment effect, significant F value, the positive results could be a Type I error. Unprotected LSD's have a very high likelihood of being a false positive. Where are the F values for each treatment effect and interaction from the ANOVA table? With 9 varieties and 5 N treatments there would be 45 treatment combinations. An LSD(10) would be
Factor	P > F									
N	0.01									
Cultivar	0.01									
N x Cultivar	0.34									



SDI Review Form 1.6

	Line 160-162 NVDI may potentially be used but these data don't support this conclusion, especially since biomass appears to be a better predictor of grain yield and NVDI much less associated with grain yield or with biomass. Soil nitrate measurement when the plants are 25-30cm tall are much more predictive of grain yield and can be used to predict whether or not supplemental N fertilizer should be applied. Blackmer, A.M.; Pottker, D.; Cerrato, M.E.; Webb, J. Correlations between Soil Nitrate Concentrations in Late Spring and Corn Yields in Iowa. J. Prod. Agric. 1988, 2, 103-109. Magdoff, F.R. Understanding the Magdoff pre-sidedress nitrate test for corn. J. Prod. Agr. 1991, 4, 297–305. Nitrate measurements are very easy to do. Miranda, K.M.; Espey, M.G.; Wink, D.A. A rapid, simple spectrophotometric method for simultaneous detection of nitrate and nitrite. Nitric oxide 2001, 5, 62-71.	expected to have around 4 false positives if there was no significant overall treatment effects (F value). Not only do you not indicate significance of the overall treatment effects, you don't indicate the significance level of the LSD. There is no way of judging the true significance of your data. Without these and without the F values however informs about the level at which each factor was significant (for the significant ones) either at 5%, 1% or 0.1% probability level. The F values have been indicated within the result sections as seen in line 79 and 87. There were no indications of F values in either lines 79 or 87. In fact, I don't see them anywhere in either manuscripts. among others. The correlations were actually done with SAS that calculates correlation values with the mean values rather than the raw values. In the correlation table what are NOL 4WAP, NOL 5WAP, NOL 6WAP, NOL 7WAP, NOL 10WAP, CWR, GWR and TBS? These are not listed anywhere except in the correlation table to grain yield. If GWR is grain weight then you're not paying attention if you are correlating grain yield to itself. If you are correlating grain weight to itself then the r^2 should be 1.
<u>Minor</u> REVISION comments		
<u>Optional/General</u> comments		



SDI Review Form 1.6

PART 2:

Are there ethical issues in this manuscript? There might be ethical issues if the author is intentionally trying bring this technology forward by ignoring the biomass data they had to collect in favour of NDVI measurements.	<u>(If yes, Kindly please write down the ethical issues here in details)</u> There are no ethical issues as the used of the green seeker has been properly referenced as indicated in the M&M section; the use of these technology has been previously reported in earlier studies like Adebayo <i>et al.</i> 2014 and Jingfeng <i>et al.</i> 2013.
Are there competing interest issues in this manuscript?	