

## ***Interactive comment on “Quantifying nitrogen losses in oil palm plantations: models and challenges” by Lénaïc Pardon et al.***

**H. Corley (Referee)**

herewardc@aol.com

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### General comments

This is a very useful paper. Nitrogen losses have a large economic cost, in addition to any environmental aspects, so the subject should be relevant to all concerned with the crop. I think they could be more critical in the comparison of models, discarding those which clearly do not give useful output. From my reading of the results, the Schmidt model is clearly the best, and I think they could identify that as the basis for further model development.

### Specific comments

Line 30 - The comparison with field measurements is the only useful test of the model's

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validity.

Section 3.3 - Sensitivity analysis: Combined results for all models, as set out here, seem rather irrelevant. Given that some of the models give poor results in comparison with actual measurements, it would be better to first identify models which might be useful (Banabas and Schmidt look best - see line 452), and then assess the sensitivity of those models only.

Lines 495-500 - I agree, and thus conclude that the Schmidt model is better than Banabas. However, Schmidt still combines leaching, run-off and erosion, so could be improved.

Line 562 - It is probably correct that leaching is the main loss pathway, and also probably correct that losses are particularly high during the immature stage, but I do not believe there are sufficient published data to support quite such a definite statement as here.

Line 563 - Losses from legume cover crop presumably only become significant when the crop starts to be shaded out and to decay.

Figure 2 - Only the pattern from the Schmidt model is similar to that shown by Pardon et al. (2016).

Figure 12 - a logarithmic scale on the Y-axis would allow differences between the smaller values to be seen

Technical comments and corrections

Line 39 - Corley & Tinker should be 2003, not 2008

Line 58 - I think this should read "...the delay between inflorescence meristem initiation..."

Figure 1, etc - These figures might be improved by including an additional line showing the range of published data found by Pardon et al. (2016).

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The emission factors in the figures are almost illegible. Greater contrast between the text and the coloured boxes is needed.

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