

## ***Interactive comment on “Herbicide weed control increases nutrient leaching as compared to mechanical weeding in a large-scale oil palm plantation” by Greta Formaglio et al.***

### **Anonymous Referee #1**

Received and published: 16 July 2020

Thank you for submitting an interesting manuscript on nutrient leaching in oil palm plantations under different weeding and fertiliser regimes. Your results are valuable for providing evidence for assessing more environmentally friendly options of growing oil palm. I support publication of this manuscript after revision.

My main comment is that the analysis/results of yield are not appropriately considered. The authors refer to previously published studies on the yield aspect but do not actually quote any data/numbers on yield. This is an important point that is missing. Any management options leading to more environmentally friendly or sustainable growing of oil palm will ultimately be scrutinised under the yield aspect. So it is important to include

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the actual figures in this assessment (even if they have been published elsewhere). Just saying there was no difference is not sufficient. Growers would like to know the actual yield to see that you were not working on a plantation with unusually high or low yield anyway which might have masked any management effects. So a revised version needs results and discussion sections that are expanded with details on yield.

In addition I have a few general and specific technical comments/corrections.

General: There should be no space between number and %. Please revise this throughout the manuscript. The term 'stem' might be more appropriate to use than 'trunk'. Please replace 'trunk' with 'stem' throughout the manuscript. The term 'conventional' is a bit misleading. Perhaps 'standard practice' or 'standard industry practice' would be a more appropriate term to use? Generally spelling and grammar need to be checked carefully, some sentences are too long and convoluted.

Specific: Title remove 'as' | 39 replace 'have' with 'has' | 40 remove 'and' | 45 remove space between 57 and % (see general comment above) | 48 introduce N as nitrogen | 59 introduce P as phosphorus NO<sub>3</sub> as nitrate | 61 comma after reference before 'whereas' | 68 remove 'of' in front of oil palm | 80 herbicides needs to be plural | 82 'herbicide weeding' perhaps clarify that this is chemical weeding with herbicides as supposed to mechanical weeding | 97 circles needs to be plural | 101 canopy interception will depend on the age of the plantation and whether there is canopy closure or not. please elaborate here and say that there will be a difference between younger and older plantations | 131 Was the plantation terraced? This should be a discussion point generally as nutrient flows will be different in plantations with even terrain as supposed to terraced plantations. It seems to become more popular (also in Indonesia) to terrace plantations (when replanting) even if the terrain is not that hilly to begin with. This might have potentially large implications on nutrient leaching. | 135 remove space between number and % | 137 chemically or mechanically weeded? Please clarify | 142 Is the fertiliser applied in pellets or granules? Broad spread? Please give details | 145 Were no EFB (empty fruit bunches) returned to the plantation? This is common practice and

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would add more organic matter to the plantation in addition to the palm fronds. if it wasn't done in your plantation, it still needs to be discussed in the discussion section. | 170 replace 'till' with 'to' | 182 check reference, should only be (2018) in brackets | 191 not clear what (2018) is suppose to mean? Should there be a reference? And do you mean combined bicarbonate and organic acids? Please clarify (also in Fig 3) | 205 do you have anything to base your assumption on? Any measurements/references? | 209 insert 'The' in front of Expert-N model | 211 insert 'the' after using | 217 add reference for Richards' equation | 224 'stem' instead of 'trunk' | 237 space between 1 and um | 246 remove 'to' in front of 192 | 306 replace 'high' with 'strong' | 318 specify here the months for typical dry and wet season | 424 But as you are saying elsewhere, they would not fertilise in the dry season either. So you might have to elaborate here. | 438 Mention EFB, POME, compost or a combination of these as they are all commonly used types of organic fertiliser in oil palm plantations | 443 circle closest to the roots for direct uptake of the fertilisers? | 453 replace 'highest' with 'higher' | 458 trunk = stem | 464 insert 'will' in front of largely | 492 replace 'increased' with 'increases' | 494 The last part of the sentence doesn't fit the first. Please rephrase. | 502 replace 'influence' with 'effect' | 505 Please rephrase this sentence, it sounds a bit clumsy and i is not that clear what you are trying to say. | 508 Replace 'have' with 'has' | 519 Start a new sentence after the reference as the second half doesn't follow the first. | 525 replace 'conventional' with 'standard practice'? | 527 This is where you need to expand on the yield aspect and include data etc. | 553 Insert 'the' in front of majority | 559 Remove 'to' in from of streams

Table 1 call this soil physicochemical parameters as it's not really biochemical Table 4 Did you quote the decimals to significant figures? Figures 2,3 and 5 either call the x axis 'month' or remove 'months' all together as it is obvious that is is a data axis (just add years) Figure 3 are RCOO and HCO3 combined or separate? Please clarify. If it is combing perhaps say '+'? | 1010 with 'unpublished' do you mean not yet published? If it is in prep, please add, otherwise remove this citation. You are contracting 'reported' with 'unpublished'.

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