

SOIL Discuss., referee comment RC2
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Comment on soil-2021-91

G.Peter Matthews (Referee)

Referee comment on "Potential effect of wetting agents added to agricultural sprays on the stability of soil aggregates" by Antonín Kintl et al., SOIL Discuss.,
<https://doi.org/10.5194/soil-2021-91-RC2>, 2021

While I was writing this review, Paul Hallett's was posted. So I have also read Hallett's general comments, and agree with them. So this review should be regarded as additive and complementary to Hallett's.

The work addresses an important topic, reports on a very considerable amount of research effort, and could be very useful. However, it could only be published following a major re-write, and even then could only be published if all our very major concerns are satisfied. The comments below should not be regarded as comprehensive and complete – they are just representative and illustrative of the very great amount of extra work that is needed in the presentation of this potentially interesting and worthwhile work before it is published. That extra work should start with addressing the major issues of explanation of rationale, methodology, statistics and results, and finish with word-by-word proof-reading – with regard to the latter, the individual corrections listed below illustrate the type of corrections needed.

Firstly – overall – although 'wetting agents added to agricultural sprays' is mentioned in the title, it is not clear from the abstract that that is what the paper is about. We have to read a long way into the text before re-discovering that. Stand back and think – what would be the usefulness of this research? Answer – if a particular wetting agent causes particular loss of soil stability, then perhaps it should be changed to a different one. So – in a typical application to a crop – how much of the wetting agent falls onto the soil rather than being absorbed by the plants? Does that order of magnitude correspond to the application you have studied? (These issues are deferred to suggested further work late in the submission.) And the soil erosion is presumably caused by rainfall dislodging the surface layer of the soil and washing it down-hill. So – how exactly did you measure the soil stability – and why such deep soil pits (annex b-4)? Do the wetting agents really penetrate that far to cause reduction in stability? And I would like to know what soil type is most affected – but find it almost impossible to judge that from the way the results are presented.

Abstract

Do not repeat the list of different types of wetting agents, but do tell us where wetting agents appear from. Invented acronyms not already accepted in frequent usage are irritating for the reader – so spell out SAS and WA. Ox should be subscript in the term Cox.

Introduction

Needs to be more focussed, especially with regard to the references – cite fewer.

Line 36 - missing “.

Line 38. aggregate consists of -> aggregates comprise

Line 47. Awkward grammar using the - symbol.

Line 55. ‘At that’ – ambiguous phrase.

Line 64. as cuticle of -> as the cuticles of

Line 81 , 82. I am not familiar with the use of the term ‘stand’.

Table 1 . I do not understand ‘sum of temperatures’ – why add the temperatures together ?

Line 285. ‘EDTA’ – explain.

Line 292. 292 personal -> principal

Results. You need to explain the rationale behind your statistical approach. What do the various methods, such as 'post-hoc Tukey's SD test' actually show you, and why did you choose that approach? I find many of the results baffling. For example, in Figure 3, why are there four different graphs, and why are there two results for each sampling point?

Line 412. Refers us to Figure 5 (before reference to Figure 4). But where is Figure 5?

Discussion. The discussion wanders around all the different factors – soil type, crop type, agricultural practice etc – but these should have been separated out as factors early on, and the statistical approach used to remove them as factors masking the deleterious effect of wetting agents. By the time we get to the discussion, we should know the effect of wetting agents on their own, independent of confounding factors – so that, for example, you could advise manufacturers of sprays to change wetting agent, or advise farmers of what soil types not to spray on. Similarly, from line 451 onwards, you start to describe the chemical make-up of the sprays – but again that should have been described early on.

Line 491 onwards. This is a 'further work' section, not part of the discussion. The problem is that many of the shortcomings of this work are stated as needing further work, but should have been sorted out in this study. Overall, there are too many citations, and the various discussions ramble rather than being compartmentalised into the various issues, each of which should be tightly focussed on.

Annex. Again – occasionally baffling. For example in annex a- and a-2 – what is the 'decomposition of the effective hypothesis', and why is 'soil horizon' a vertical label (with no tick mark) in Annex a-1, but a horizontal label in a-2? And annex d-8 is incomprehensible without further explanation adjacent to the figure.