

Abstract:

14: Compared to unfertilized controls or mineral fertilized control be specific.

Introduction:

25-26: Transfer C to the soil via root exudates and decaying aboveground and belowground organic matter.

29: Consider introducing the concept 4/1000 to the reader.

29-30: Mitigating anthropogenic GHG emissions by restoring/enhancing soil C stocks.

31-32: It's not only about countering tillage, it's about minimizing all agricultural management strategies that could have negative impacts on SOC stocks. i.e., no/minimal-tillage, cover and catch crops, and organic soil amendments.

33: Why do you research compost and not one of the other strategies for C sequestration? You can find sources that indicate the especially promising character of compost. Compost is enhancing several soil ecosystem services, often the decay of compost is necessary and inevitable; you are mainly interested in long term C sequestration. "The soil carbon dilemma: Shall we hoard it or use it?" Janzen 2006, maybe an interesting read.

37: Is SOC accrual and SOC sequestration not redundant? This paper is very relevant (Moine 2023); however, the message is that the contribution of SOC sequestration to climate change mitigation are most likely insignificant. Not sure if this source is justifying your research in the way you write it right now.

39: Typo, grasslands converted to grasslands? Don't think conversion of croplands to grasslands is a feasible strategy.

41: How does appropriate management look like?

45: Because the are not cultivated, no manipulation is feasible.

52: How much compost is leading to what increase in SOC stocks and where?

52-53: Source?

55-59: It seems you are about to stage your research gap and objective, but then in the next paragraph you move on with aboveground and belowground interactions, consider to improve your logic.

58-59: How do you derive at isotope labelling, provide some context and sources.

60: Why zoom out again on land management practices? You are already above mentioning that you focus is on compost.

60-66: Belowground biomass is more prone to be transformed in SOC pool, however also aboveground biomass has a significant effect on SOC stocks. Try to make this part more concise.

69: Why is water availability mentioned here?

74-75: How can compost mitigate drought?

75: You are researching compost not biochar.

78: In which direction is C allocation modified?

80-81: Belongs above to 74-75

81-82: Soil texture is not equivalent to SOM quality and quantity.

84: Is moisture retention equivalent to WHC in your context?

87-90: This argumentation lacks logic, try to split into several clear sentences.

Methods:

111: The normal/control management practice in this area is no fertilization?

115-116: Is this the C:N and $\delta^{13}C$ of the maize or of the final compost? Remove ambiguity.

116-117: Summer 2019, be more specific, what month?

118: How big can I imagine the compost pile, was the composting done inside or outside in the rain? This can have significant effects on the resulting product.

119: Why did you choose this application rate? It is quite high, likely about 500 kg of N per ha.

120-121: How did you estimate the amount of C from wet weight compost?

151: How long at 960 °C?

177-222 Consider changing title to "Data analyses and statistics" since your statistics are only covered in the last part

Results:

253-254: Over the whole soil profile or only in the in the top 10 cm?

254-258: Confusing sentence.

259-262: Try to formulate stronger that is easier to follow that there was no significant effect on biomass after the drought treatments.

Fig. 2: change color to black for soil bulk density 0-5 cm

273-275: Make two sentences one about the effect of drought on root traits and one on the effect of compost on root traits.

300-307: Are this changes significant or not? This paragraph is hard to follow, consider rephrasing.

303: Typo, decrease in C content from 33.5 to 2.99 mg/g?

Discussion:

319-320: Seems logical that you find not all C back after 3 years, but also, indirect effects are possible due to increased primary production that could lead to more OM supply to the soil over time.

323-324: Obviously, if you add C to the soil, you will have more SOC, these SOC levels will decrease over time as there is no permanent stabilized C in soils.

336: Be specific, you saw an increase in % C but not in C stocks.

339-341: Also consider that these SOC changes only have a climate change mitigating effect if the C is not just transported from one place to another.

352-353: See: "The soil carbon dilemma: Shall we hoard it or use it?" Janzen 2006

Conclusion:

437-440: You showed results on the impact of the catenary positions, however you miss to discuss these results and only mention them briefly in the conclusion. Consider removing them from your results and other parts of the previous text or add a sufficient discussion of these results.

General remarks:

Be consistent with the naming of concepts.

Refer to drought or reduced precipitation, not both people might think this are two different concepts. Same for water holding capacity, increased moisture retention and soil water retention.