Review of: "Analyzing the Effects of Organic Amendments on Soil Erosion Dynamics: A Comprehensive Study on Application Methods and Timing"

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Potential competing interests: No potential competing interests to declare.

- Ensure consistency in terminology throughout the introduction. For example, consider using either "soil loss" or "erosion" consistently.
- What is your justification for using the application method below? Please refer to some literature.

> *This study aims to fill that gap by investigating the impact of various amendments, including biochar from barberry, vermicompost, poultry manure, and wheat straw, applied through complete mixing and surface spreading at 60-day intervals over 180 days, on runoff and soil loss.*

- Specify the source and type of the pyrolysis equipment used for biochar production & mention the particle size of the resulting biochar after sieving.
- Provide additional details on the organic residues used for vermicompost production & specify any particular conditions or controls during the 50-day process.
- Offer more insights into the year-long production process, such as the specific steps involved or any unique aspects of the process.
- Specify the units of measurement for each chemical property analyzed & consider grouping related properties together for better organization.
- Please add literature for the discussion below:

> *4.1. Soil erosion dynamics and amendment effects*
>
> *The results of this study shed light on the complex interplay between soil erosion dynamics and the application of various organic amendments. As highlighted in the introduction, soil erosion poses a significant threat to agricultural sustainability and environmental conservation. The adverse effects of erosion on soil quantity and quality were evident in the alterations observed in sand, silt, and clay percentages. The increased sand content after the rainfall simulator application aligns with findings in arid and semi-arid regions where erosion is often exacerbated due to insufficient organic matter.*
>
> *The choice of organic amendments, including barberry biochar, vermicompost, poultry manure, and wheat straw,*

played a pivotal role in influencing soil properties. The efficacy of these amendments in mitigating erosion, demonstrated by reduced runoff coefficients and sediment discharge rates, resonates with findings in similar studies employing organic materials to enhance soil quality.

4.2. Temporal dynamics and application methods

The temporal aspect of the study, with amendments applied at different intervals, offers insights into the temporal effectiveness of organic amendments. The variations observed over time underscore the dynamic nature of soil erosion processes and the need for comprehensive, long-term studies to capture the nuanced impacts of amendments. Notably, the 180-day duration consistently proved more effective in reducing erosion and sedimentation, aligning with the principles of sustained soil management practices.

The comparison of application methods, surface spreading, and complete mixing, introduces an additional layer of complexity. The mixed method, while yielding higher values for parameters like Q and runoff duration at zero time, showcased nuanced variations over the 180-day period. These findings underscore the importance of considering not only the type of amendment but also the application method and duration to optimize erosion control strategies.

4.3. Barberry biochar: a novel amendment strategy

The specific focus on barberry biochar, derived from plant residues generated during the pruning of barberry plants, adds a novel dimension to the study. As outlined in the literature review, biochar has demonstrated soil-enhancing properties, and its application has shown promise in reducing soil erosion. The results of this study reinforce the potential of barberry biochar in significantly mitigating erosion effects, presenting a valuable and locally available organic amendment.

4.4. Implications for sustainable agriculture and resource management

The findings of this study hold significant implications for sustainable agriculture, especially in regions like South Khorasan Province, where barberry production is a major economic activity. The utilization of barberry residues for biochar production not only addresses the challenge of agricultural waste management but also contributes to soil conservation efforts. The positive impact on soil physicochemical properties further highlights the multifaceted benefits of such organic amendments in enhancing overall soil fertility.

References:

I would like to offer a friendly suggestion to consider diversifying your references by incorporating works from various authors. While I understand the importance of citing relevant studies, it's worth noting that an excessive reliance on self-citations, such as Vahidi, M.J. et al, and Sadeghi, S.H.R. et al, may be perceived as less favorable in academic writing.

Broadening the range of your references to include contributions from different authors not only enriches the scope of your information but also contributes to the overall credibility of your research.