

# **Missing the input: The underrepresentation of plant physiology in global soil carbon research**

## ***Supplemental table/figures***

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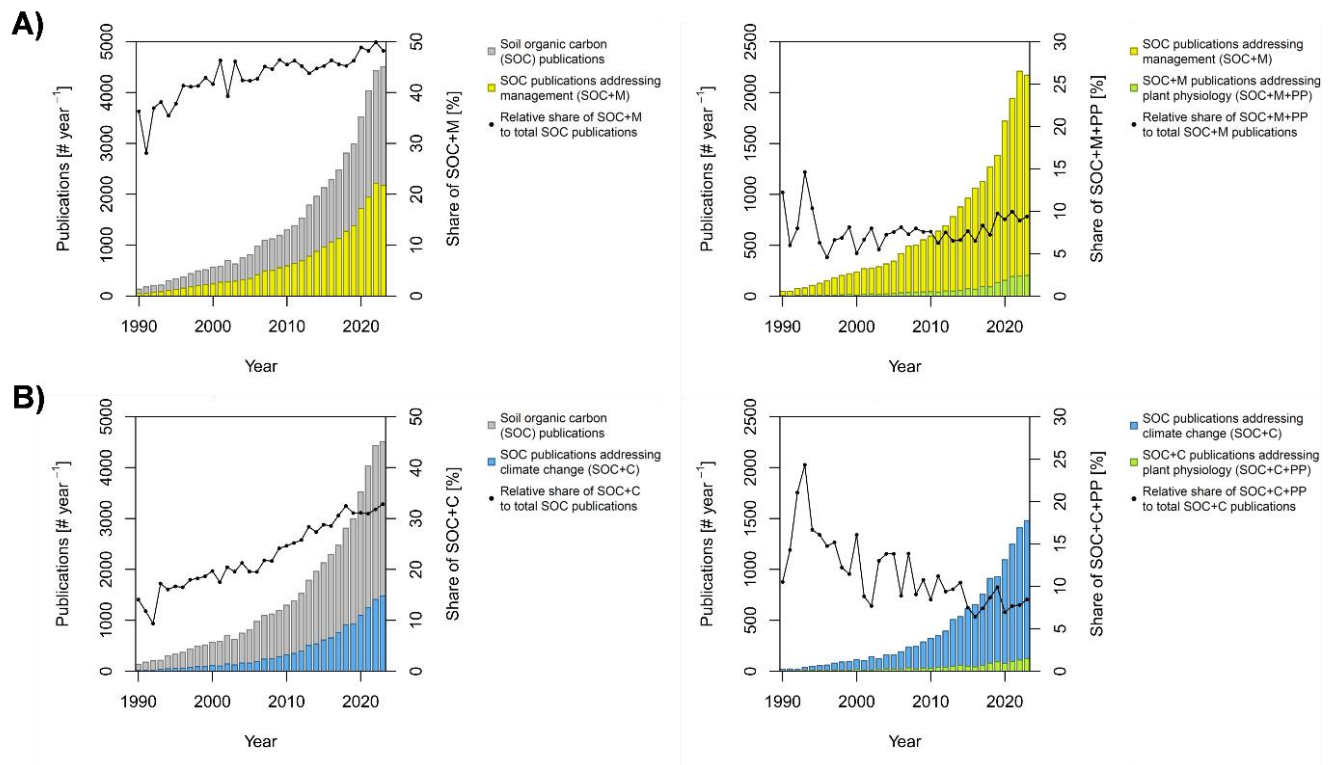
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Number of Supplemental Tables: 1

Number of Supplemental Figures: 2

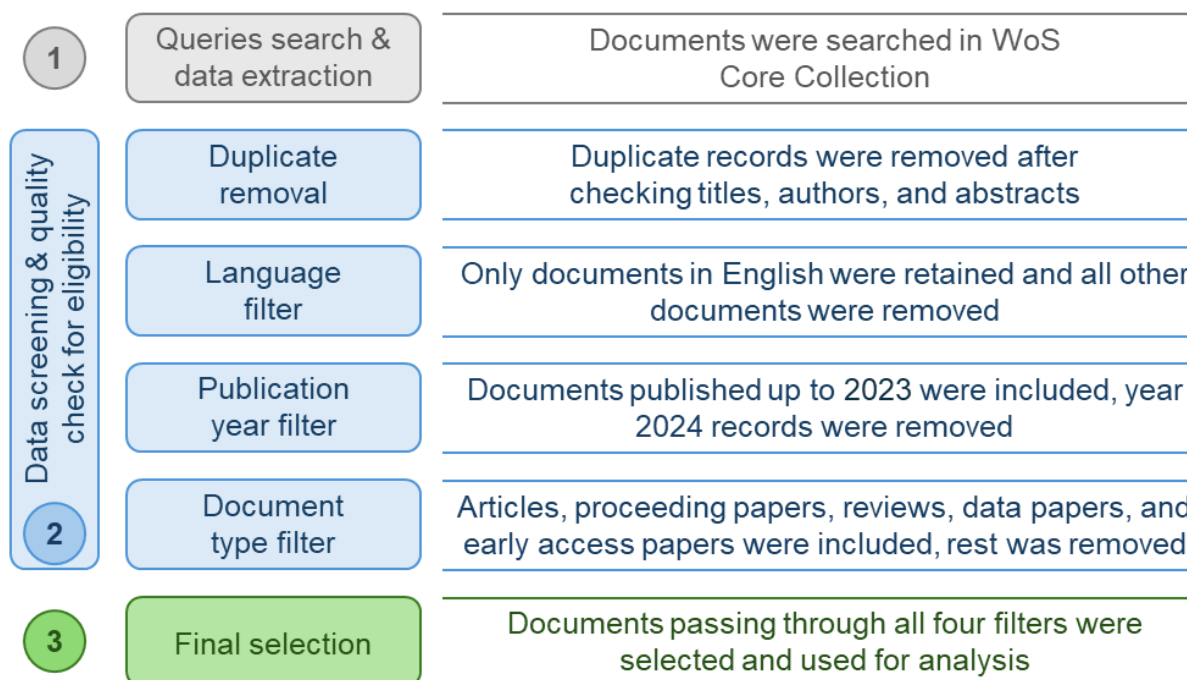
**Supplemental Table S1: Keywords and corresponding search terms used to build queries for bibliometric analyses in Web of Science™.**

| Query  | Keywords   | Search terms in bibliometric query   |
|--|--|--|
| Soil organic carbon                                    | Soil organic carbon, soil organic matter   | Soil organic carbon, soil organic C, organic carbon in soil*, organic carbon of soil*, organic carbon from soil*, organic carbon soil*, soil organic matter, organic matter in soil*, organic matter of soil *, organic matter From soil*, organic matter soil*  |
| Plant physiological processes                          | Photosynthesis, transpiration, stomatal conductance, carbon allocation, carbon translocation, plant growth, leaf growth, shoot growth, root growth, root exudation, lignification, suberisation, barrier formation, barrier development, secondary growth, secondary thickening, plant respiration, leaf respiration, shoot respiration, root respiration, plant senescence, root senescence, leaf senescence, shoot senescence  | Photosynthesis, transpiration, stomatal conductance, carbon allocation, carbon translocation, plant growth, plant height, leaf growth, shoot growth, root growth, root length, root density, root mass, root weight, root penetration, root exudat*, lignification, suberisation, suberization, barrier formation, barrier development, secondary growth, secondary thickening, plant respiration, leaf respiration, shoot respiration, root respiration, plant senescence, root senescence, leaf senescence, shoot senescence   |
| Land use and management                                | Conservation agriculture, regenerative agriculture, sustainable intensification, intensive agriculture, tillage, drainage, irrigation, weeding, weed control, fertilisation, crop rotation, species diversity, cover crops, herbal leys, permanent leys, temporary leys, organic amendments, manure application, compost application, slurry application, burning, residue retention, clear cutting, clearcut felling, clearcut logging, shelterwood cutting, logging, selective cutting, felling, deforestation, afforestation, agroforestry, silvopasture, silvopastoral, clearing, grazing, herbivory, grazing management, rotational grazing, intercropping, strip cropping, multicropping, permaculture, terracing, integrated crop livestock, forestry crop livestock, diversification | Conservation agriculture, precision agriculture, regenerative agriculture, organic agriculture, sustainable intensification, intensive agriculture, tillage, no tillage, zero tillage, reduced tillage, reducing tillage, minimum tillage, strip tillage, drainage, irrigation, weeding, weed control, weed removal, fertilizer, fertiliser, fertilisation, fertilization, crop rotation, species diversity, cover crop*, herbal ley*, leys, permanent ley*, temporary ley*, organic amendment*, manure, compost, slurry, burning, residue retention, residue incorporation, residue mixing, residue removal, clear cutting, clearcut felling, clearcut logging, shelterwood cutting, felling, logging, selective cutting, cutting, deforestation, afforestation, agroforestry, silvopasture, silvopastoral, clearing, grazing, herbivory, grazing management, rotational grazing, intercropping, inter cropping, strip cropping, multicropping, multiple cropping, permaculture, terracing, integrated crop livestock, forestry crop livestock, diversification |
| Climate change and associated environmental conditions | Climate change, global warming, elevated carbon dioxide, extreme weather, drought, low soil moisture, excess soil moisture, dry spell, wet spell, waterlogged soil, anaerobic soil, anaerobicity, water logging, water filled pore space, saturation level, air filled pore space, flood, inundation, temperature extreme, high temperature, low temperature, heat wave, soil moisture deficit, soil moisture surplus, hypoxia, anoxia, weather, climate variability   | Climate change, global warming, elevated CO2, elevated carbon dioxide, extreme weather, weather extreme, drought, low soil moisture, high soil moisture, excess soil moisture, soil moisture Deficit, soil moisture surplus, water scarcity, water deficit, dry spell, wet spell, flood*, waterlogg*, waterlogg*, anaerobic*, water filled pore space*, air filled pore space*, saturation, inundation, temperature extreme, extreme temperature, precipitation, high temperature, low temperature, heat wave*, warming, hypoxi*, anoxi*, weather variation*, weather pattern*, weather variabilit*, climate variabilit*, climat* extreme*, cold climat*, hot climat*, freez*  |



15 **Supplemental Figure S1: The representation of plant physiology in global research elucidating associations between soil organic carbon and land use and management or climate change between 1990 and 2023. A) (left) Share of soil organic carbon publications addressing land use and management and (right) share of soil organic carbon publications addressing land use and management and plant physiological processes. B) (left) Share of soil organic carbon publications addressing climate change and associated environmental conditions and (right) share of soil organic carbon publications addressing climate change and associated**

20 **environmental conditions and plant physiological processes.**



**Supplemental Figure S2: Flow chart diagram depicting data search and data filtering pipeline. Raw data obtained from search in Web of Science™ (WoS) were passed through four filtering steps (duplicates, language, year, publication type) to isolate publications relevant to the bibliometric analysis presented here.**

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