

## Master Thesis at FiBL

---

<b>Title</b>	<b>Long-term impact of biochar on biological soil quality on a field scale</b>
--------------	--

---

<b>Background</b>	<p>Biochar is a carbon rich product stemming from anaerobic combustion of biomass and perceived as one of the few options to effectively remove CO<sub>2</sub> from the atmosphere. For this, biochar is amended to agriculturally managed soils, forming a stable carbon pool and possibly enhancing soil quality. Yet, soil amendment with biochar also poses a possible threat on soil biology due to unknown long-term impact on microbial diversity and functioning.</p>
-------------------	---

The project BlackGoesGreen, aims to identify the long-term impact of biochar amendment on soil chemical, physical and biological soil quality. In 2021, biochar was applied to five field sites managed in the vicinity of Zürich at a rate of 8 t ha<sup>-1</sup> and evolution of agronomic parameters as well as chemical and physical soil quality is monitored.

Additionally, a BAFU-funded project aims to quantify evolution of biological soil quality indicators to identify possible threats on soil biodiversity and functioning. The Msc. thesis will be embedded within this subproject and will be executed in close collaboration with the project team. Thus, the outcomes of the thesis will contribute to federal risk assessment of biochar amendment on biological soil quality.

### Research questions:

- Does biochar affect soil N, C and P cycling capacity
- Does biochar increase microbial biomass carbon and nitrogen contents?
- Is soil respiration affected by biochar amendment?
- (Optional) Does biochar amendment change fungal and bacterial community composition

---

<b>Procedure</b>	<p>This Msc. Thesis will start in February 2024 with a field sampling campaign also including a long-term field experiment on recycling fertilizers. Subsequently, soil samples will be processed in the lab to determine key biological soil quality indicators such as microbial biomass carbon and nitrogen, soil respiration and activity of C, N and P cycling enzymes. Additionally, taxonomic marker genes for soil bacteria and fungi will be assessed by the project team and, depending on the duration of the thesis, the Msc student can assist and learn this procedure. Laboratory work will be done at FiBL (Frick/AG). Statistical analysis will be done via R.</p>
------------------	---

---

---

**Requirements** We seek a student (biology, agronomy, environmental sciences) who is motivated to do research in the field of soil biology and has a high willingness to carry out field and lab work. A driving license is desired. Laboratory experience and knowledge in R are of advantage

---

**Contacts** **Dr. Hans-Martin Krause**  
Forschungsinstitut für biologischen Landbau FiBL | Ackerstrasse 113 | 5070 Frick | Tel +41 62 865 0409 | [hans-martin.krause@fibl.org](mailto:hans-martin.krause@fibl.org)  
**Dr. Martina Lori**  
Forschungsinstitut für biologischen Landbau FiBL | Ackerstrasse 113 | 5070 Frick | Tel +41 62 865 7271 | [martina.lori@fibl.org](mailto:martina.lori@fibl.org)

---

**Duration** flexible, but starting February 2024

---

[fibl.org/de/themen/projektdatenbank/projektitem/project/2204](https://fibl.org/de/themen/projektdatenbank/projektitem/project/2204)

---