From waste to yield: Can sewage sludge biochar enhance crop production and carbon storage?

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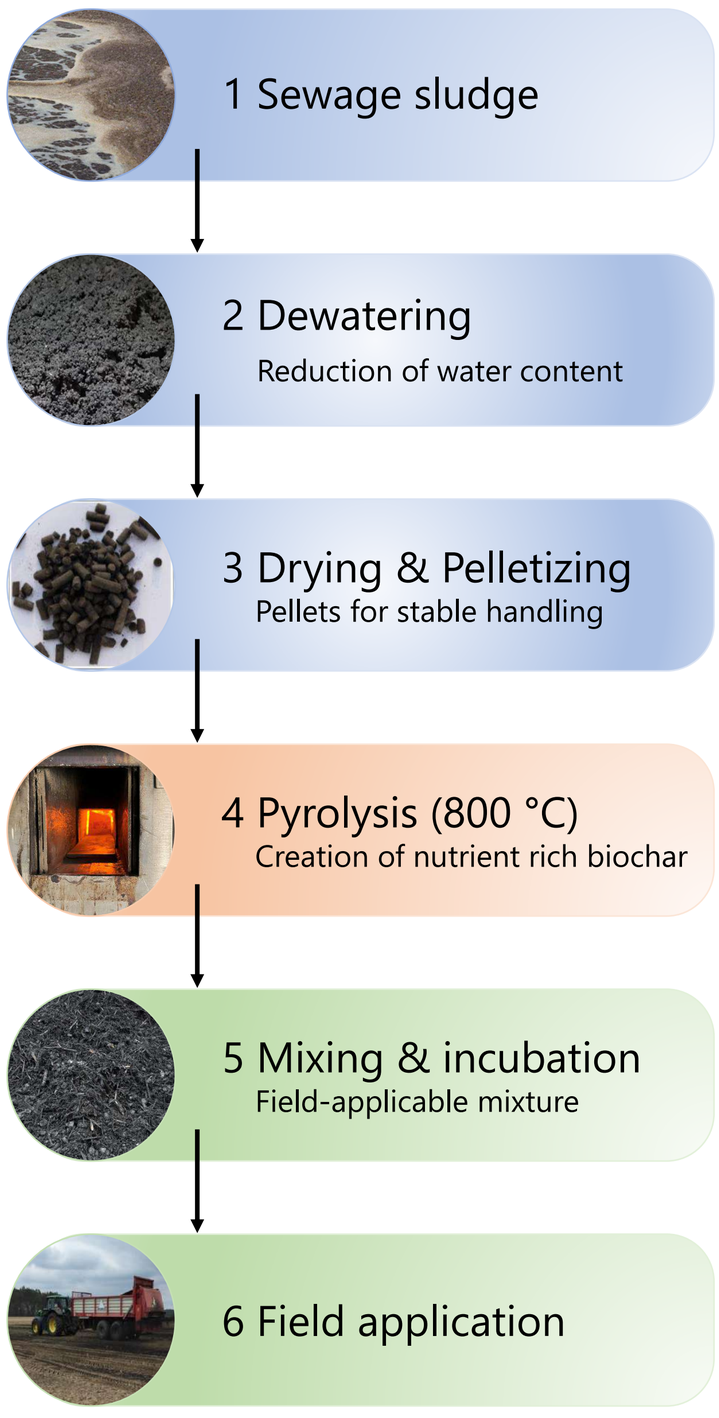
SCAN ME

Sewage sludge biochar **increased maize yield** while simultanously **increasing soil carbon contents**.

1. Why it matters

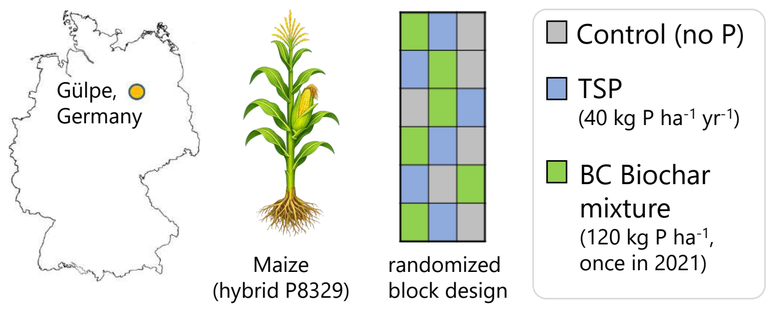
- Phosphorus is essential for food production and a finite resource.
- Municipal sewage sludge contains recoverable P.
- Pyrolysis converts sewage sludge into nutrient-rich biochar.
- Biochar application can improve crop production and store carbon in soils.

2. From sewage sludge to biochar mixture



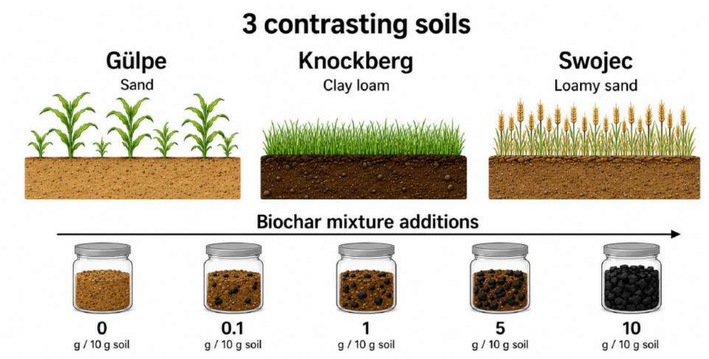
3. Experimental Setup

FIELD EXPERIMENT



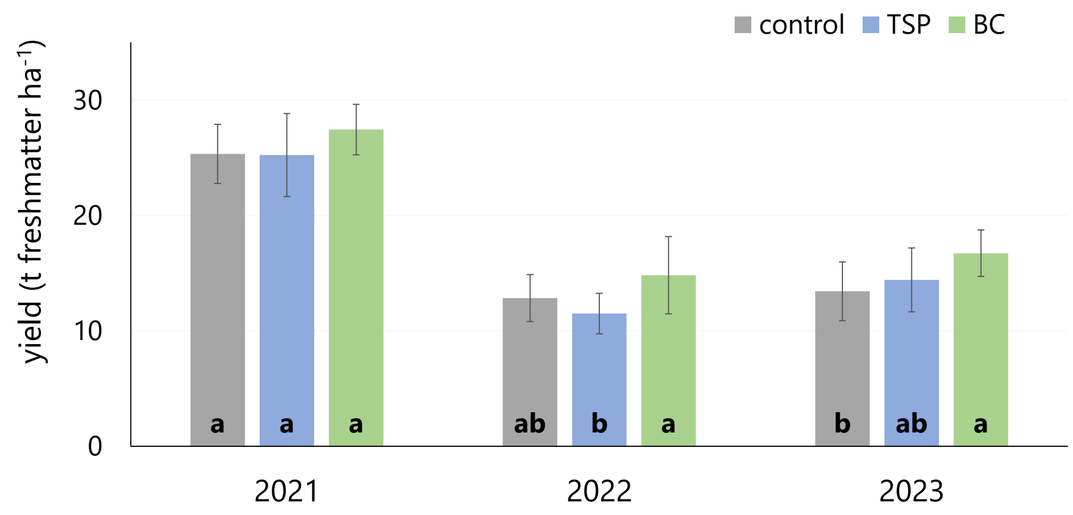
3-years | sandy Gleysol | P-fertilizer impact

INCUBATION EXPERIMENT



100 day incubation | soil C dynamics

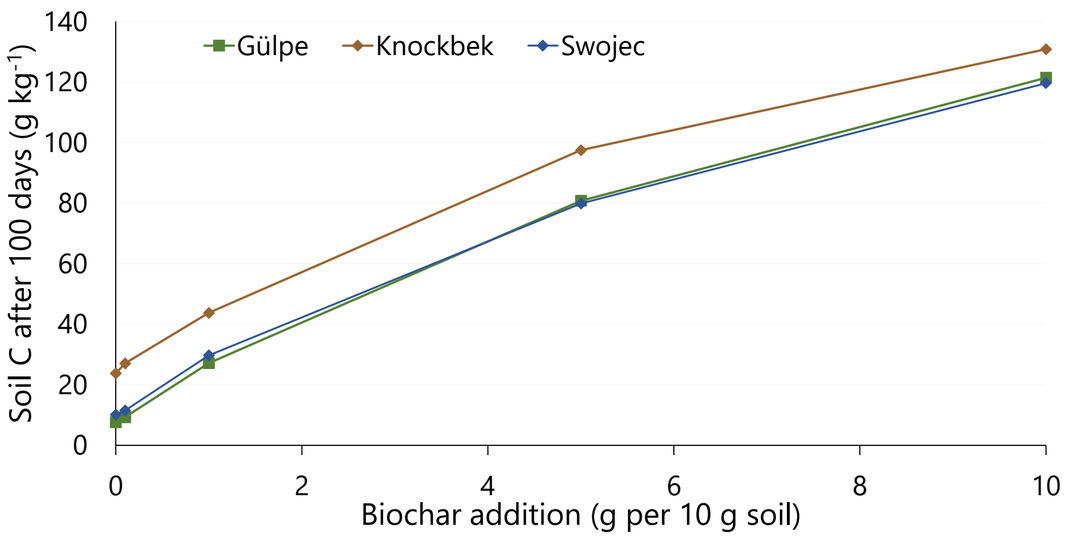
4. Maize yield response (field experiment)



+ 10 – 25 % higher yield with biochar mixture compared to unfertilized control



5. Soil carbon acculumulation (incubation experiment)





Increasing biochar additions consistently increased soil carbon contents in all three soils

6. Key take-home messages

Recycled nutrients
Sewage sludge biochar provides a valuable phosphorus source for crops

Improved crop yield
Biochar mixture increased maize yield by 10-25 % compared to unfertilized control.



Carbon storage
Biochar additions increased soil carbon content.

Circular solutions
Pyrolysis of sewage sludge supports circular nutrient management and sustainable soil use.