

How to create a biochar business?



Die beste Erde unter der Sonne

The main mistakes of the past in scientific experiments

- fresh biochar
- large pieces of biochar
- too less nitrogen
- agrochemicals
- tillage
- crop rotation

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The facts:

- Terra Preta exists
- Terra Preta is a very fertile, manmade soil
- Biochar is one of the most important amendments for Terra Preta
- If in your experiment biochar does not work - **you** make a mistake

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Before you can create a product, you have to understand how biochar can-could-should work!

Before you can understand, how biochar can help to create fertile soils, you have to understand, **how you can create fertile soils without biochar!**

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How can we create stable humus in soils?



5% SOM but different mineral-ratio



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How can we create stable humus in soils?

- **create a perfect living room for microorganisms !!!**
- big amounts of organic matter
- oxygen, water, high surface area
- neutral pH-value (6-8)
- nitrogen (C:N = 10:1)
- minerals in right ratio (Si, P, S, Cl, **Ca, Mg, K, Na**)

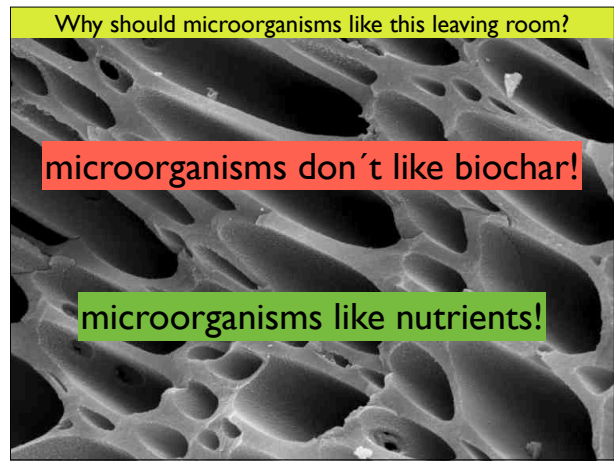
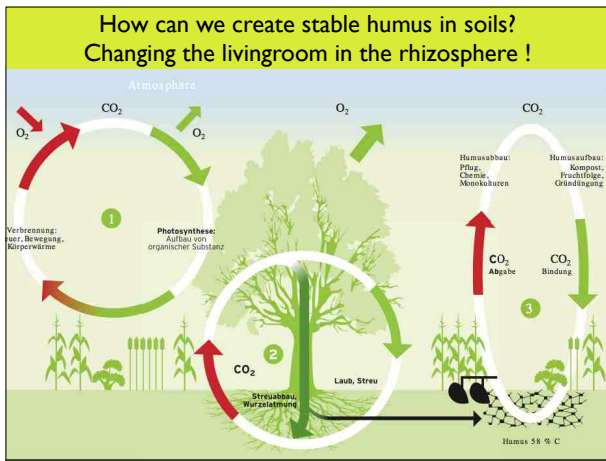
Humic Acid
SOIL SECRETS

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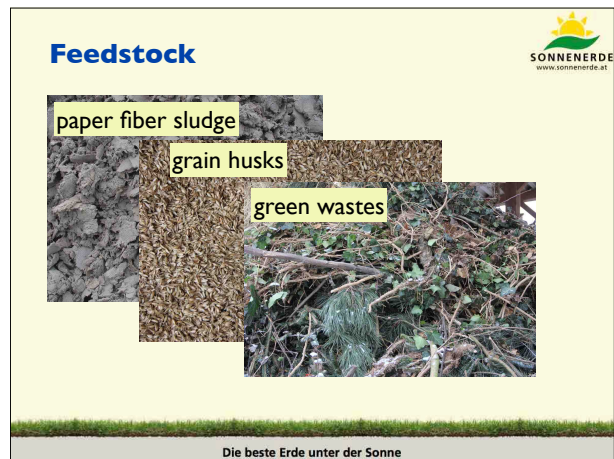
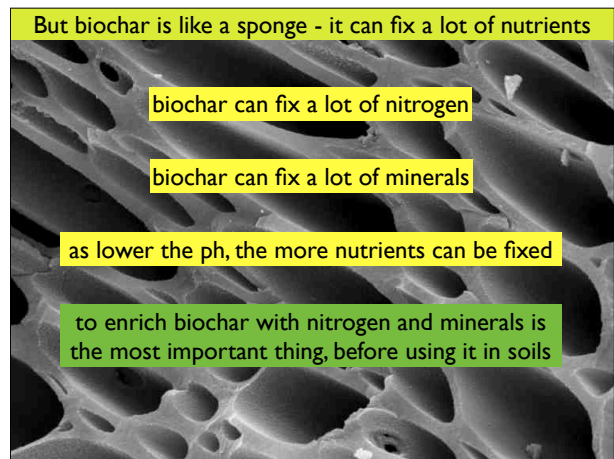
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- trace elements (Mo, Se, Co, Fe)
- 60 nano and pico elements

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- ### How can we change the livingroom in the rhizosphere !
- bring different roots into the soil
 - bring different food into the soil - the whole year
 - bring nitrogen and minerals into the soil
 - don't destroy the living room (tillage)
 - don't use agrochemicals
 - don't use chemical fertilizer
 - it works faster, if you bring a ready livingroom into the soil (=compost)
- Humic Acid
SOIL SECRETS
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- ### Construction and operation of a Pyreg-plant
- because it can be produced a very high quality of biochar
 - because the emissions are very low
 - because the facility was one of the most developed one
 - Interesting scale, affordable
- SONNENERDE
www.sonnenerde.at
- Die beste Erde unter der Sonne



In the dryingbox we use the excess energy of the pyrolysis-process



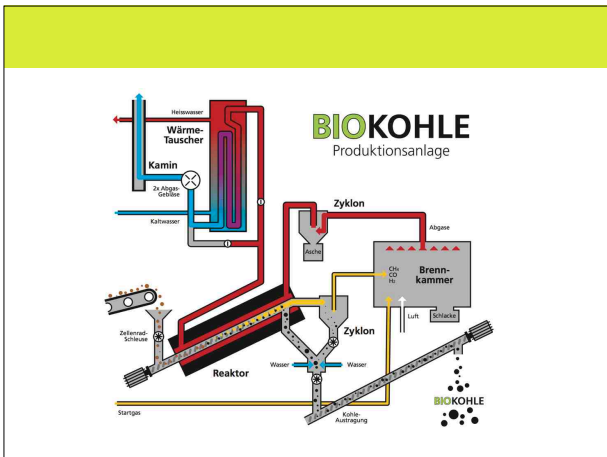
The charring is a pyreg reactor
In the background is the exhaust heat exchanger



The loading is large enough for the daily requirement of fuel



I am happy with my biochar



Practical tests in raised beds



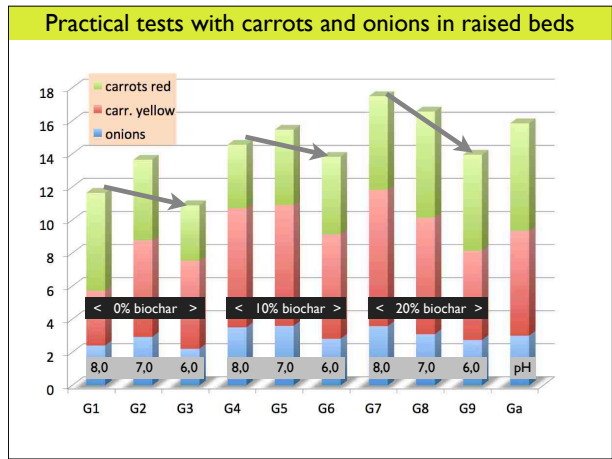
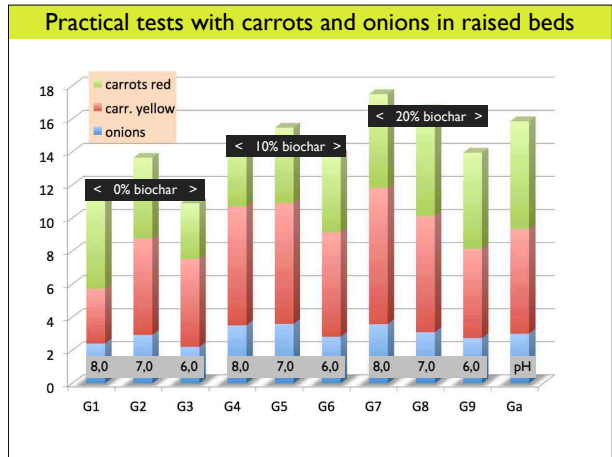
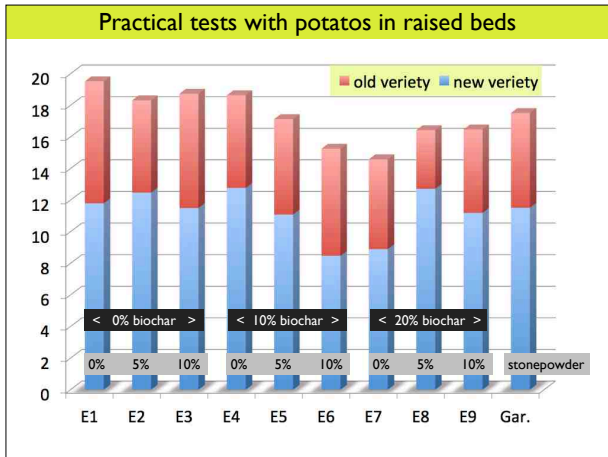
Experimental results of Sonnenerde (since 2008):

- 10% biochar additive: Measurable benefits
- C-and N-losses are reduced
- By fermentation (Effective Microorganisms), no additional benefit
- By combining 10% stone powder + 20% biochar: convergence of microbiology at TP
- By reducing the pH - no benefits

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Practical tests with potatos in raised beds





Our products:

- Black soil (Terra Preta)
- Soil-activator
- Carbon-fertilizer
- Animal food amendment

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Black soil (Terra Preta):

- 70% green wastes + 20% biochar + 10% stone powder
- 4 weeks composting in small piles
- add 10% clay and 10% crushed brick
- 4 weeks composting in small piles
- store it in big piles = biochar-compost

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Black soil (Terra Preta):

- biochar-compost + 10% sand + 10% lava
- add 1% soil-activator
- screening 15mm
- we sell it for 132,00 € / m3

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Soil-activator



How create a soilactivator:



- reduce the pH of biochar
- increase the surface area
- enrich it with nitrogen
- enrich it with minerals and trace elements
- enrich it with microorganisms
- very fine screening (8mm)

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The aim of the soil-activator:



- initiate a kind of Terra Preta effect (increasing carbon content itself)
- stabilize a higher humus level
- stabilize / increase yield

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Post-treatment of biochar to reduce pH end enrich with nitrogen



Addition of trace elements to develop a soil-activator



Very fine screening (8mm) of the ready soil-activator



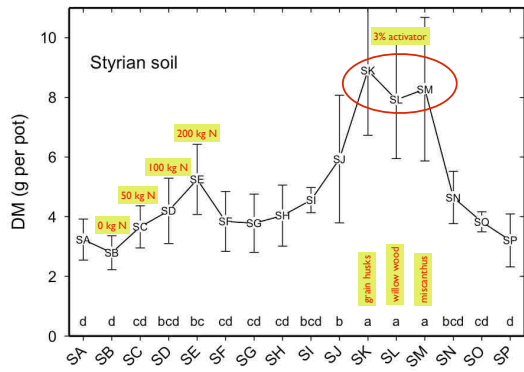
Mixing biochar, compost, nitrogen and trace elements with our oldest (and best) converting machine



Create the first mixtures in small amounts



First pot experiment with a new soil-activator



First plot trials with biochar-composts



Second pot experiment



Second plot trials



How we produce our soilactivator now:

- post-treatment of biochar with a mixture of phosphorous acid + ammoniasulfat
- Mixing this enriched biochar with 6-week-compost and 10% stone powder
- Screen this mixture after 4 weeks - 8mm

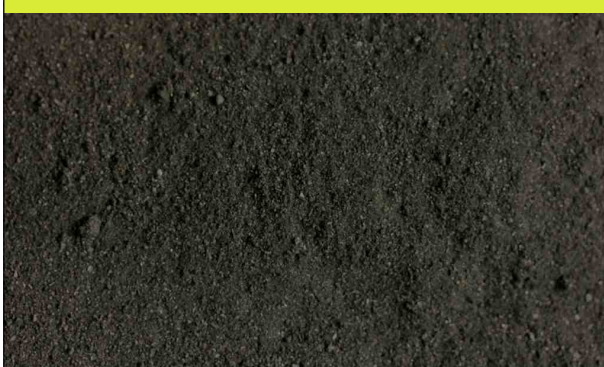


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Produce biochar-powder (amendment for animal-food)



food amendment



Create a market for biochar

- Scientists and practitioners must work more closely together
- We need positive results, how biochar can work
- The product has to work in practice immediately after application



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Summary

- Our biochar plant works continuously
- We can produce different kinds of biochar
- We try to develop different products from and with biochar
- There is a big market for biochar products, but its not so easy to get it.
- Biochar has only a chance, if we can make it economically

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Thanks for your attention

