



Biochar in Field Trials

Experiences from SEGES

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SEGES Innovation



STRAW



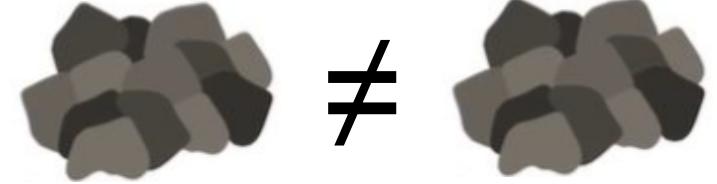
WOOD CHIPS

DIGESTATE FIBRES

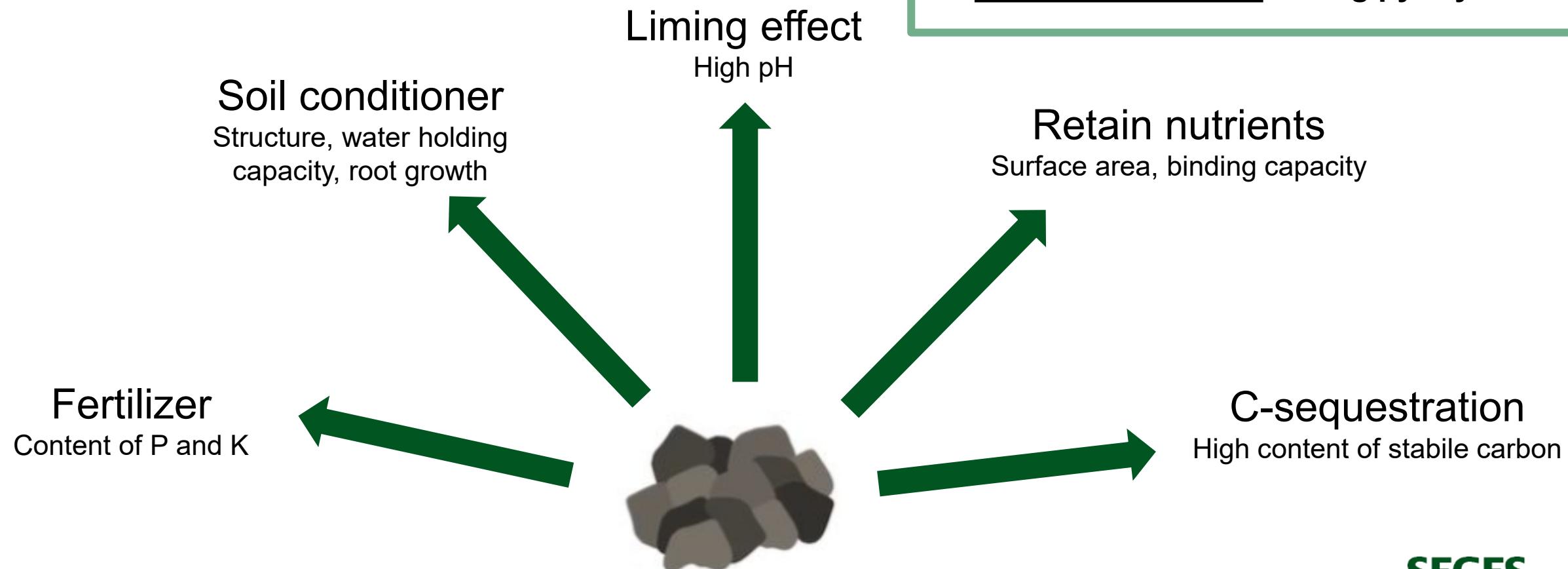


STRAW
Particulate

How biochar affects soil and crops



Biochar's physical and chemical properties depend on feedstock and process conditions during pyrolysis



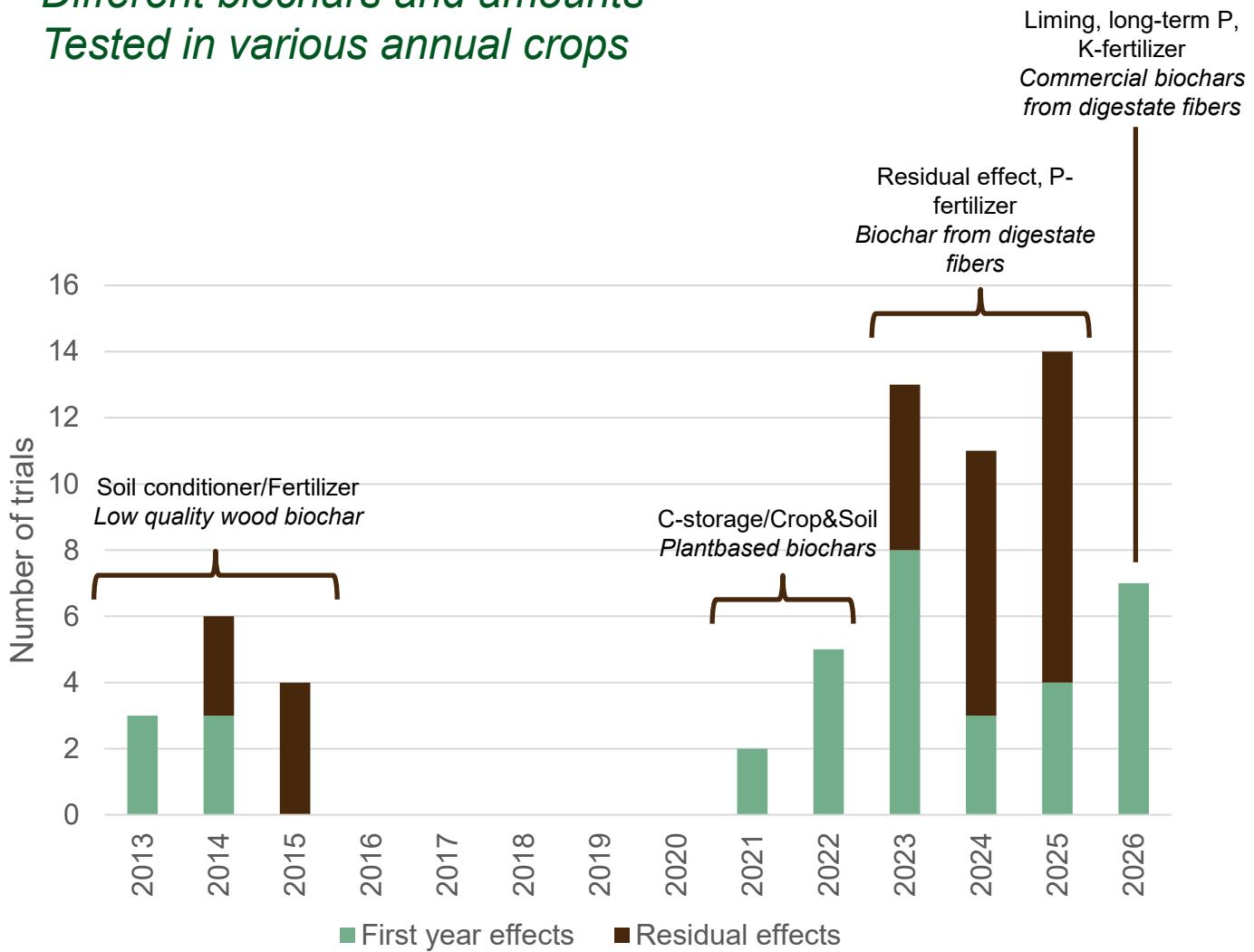
Our focus



SEGES field trials with biochar

30+ field trials since 2013

Different biochars and amounts
Tested in various annual crops



Biochar types:

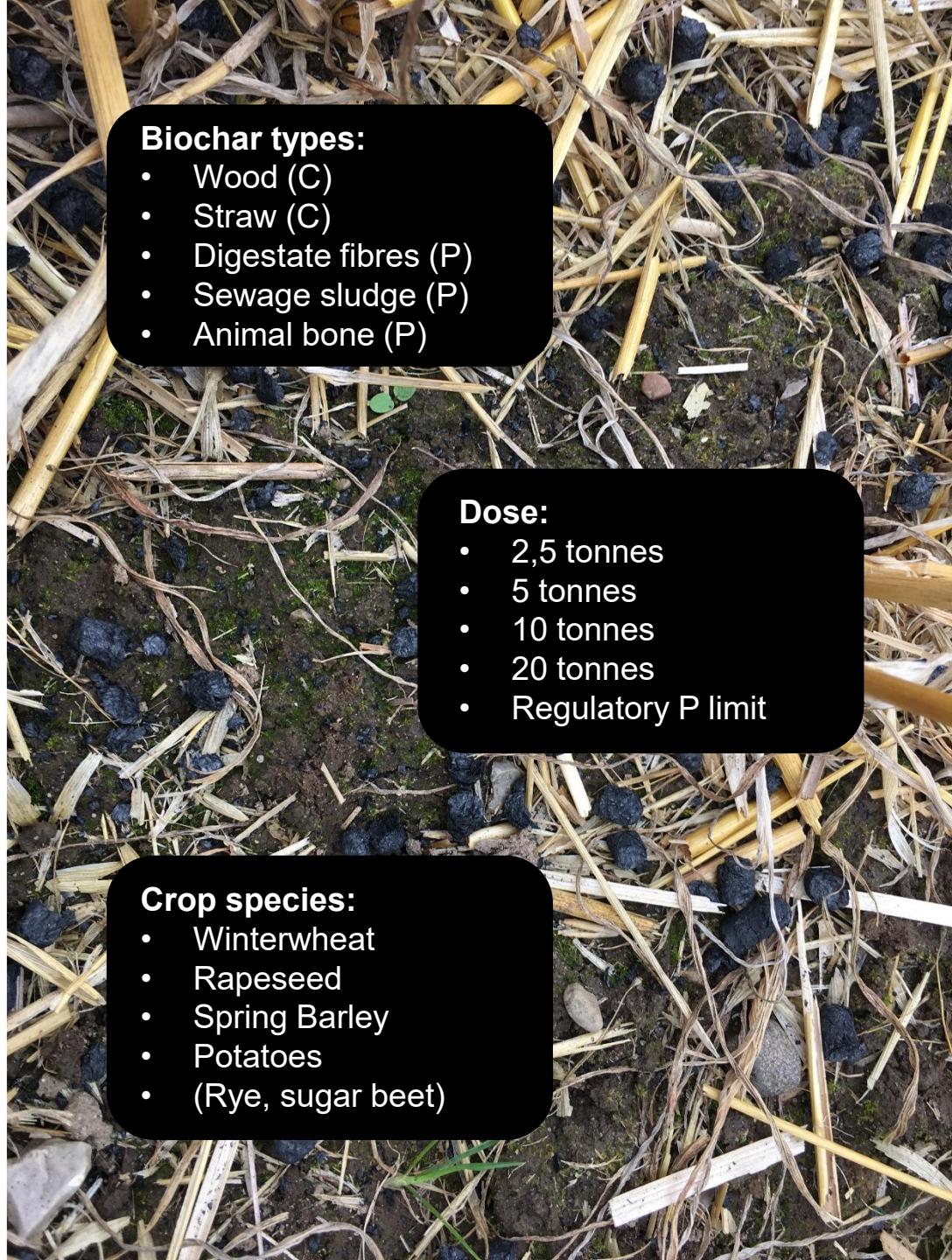
- Wood (C)
- Straw (C)
- Digestate fibres (P)
- Sewage sludge (P)
- Animal bone (P)

Dose:

- 2,5 tonnes
- 5 tonnes
- 10 tonnes
- 20 tonnes
- Regulatory P limit

Crop species:

- Winterwheat
- Rapeseed
- Spring Barley
- Potatoes
- (Rye, sugar beet)



Considerations on ('Long-term') field trials with biochar

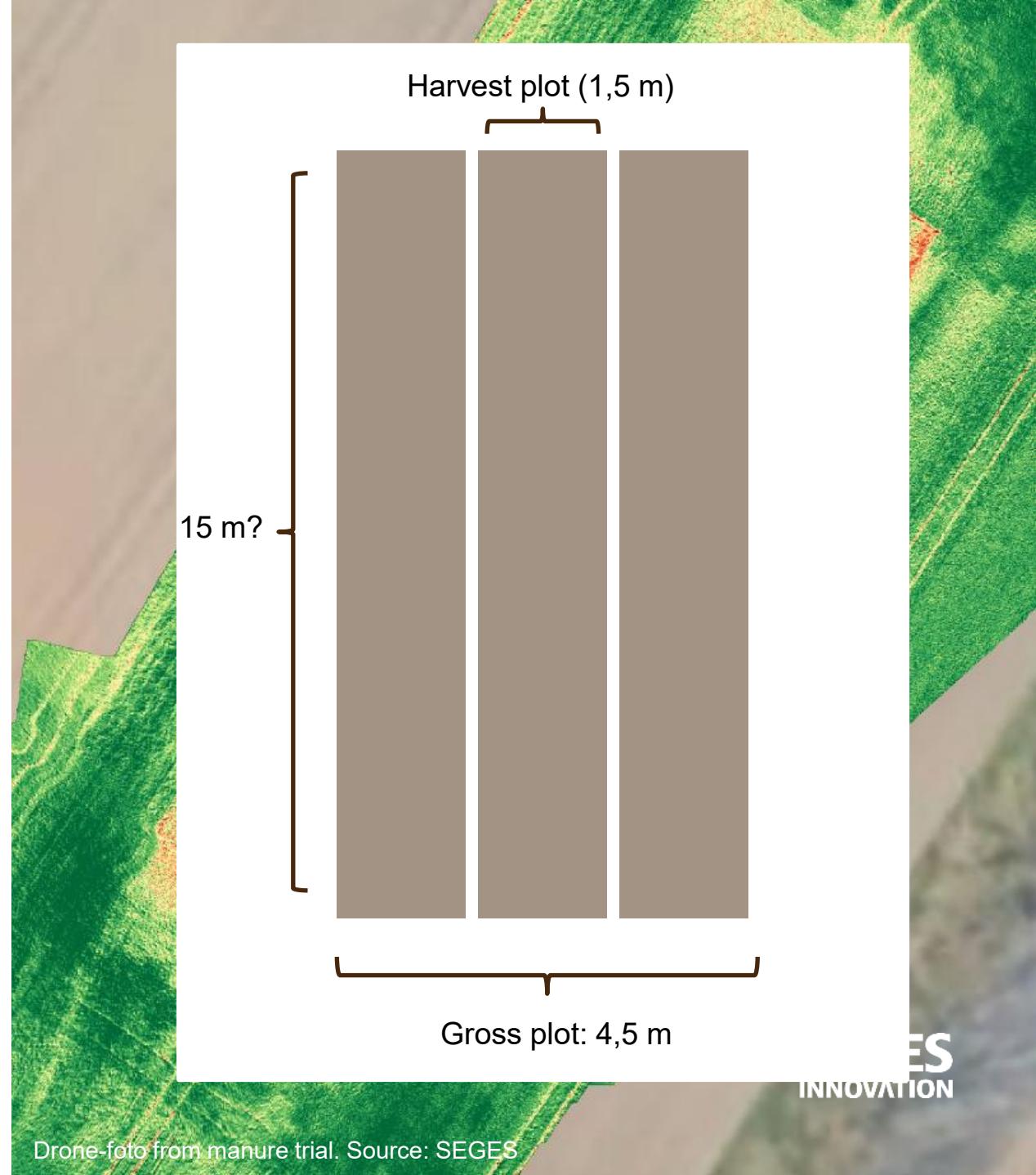
- Be specific: What is the main objective?
- Comprehensive characterization of soil and biochar
 - Keep a reference sample of the biochars (closed container)
 - Be aware: Biochar properties can change over time
- Marking trial/plots with GPS is essential
- What is the right base fertilizer for all plots?
 - Consider P and K in the biochar
- Multi-year application?
 - Biochar ageing



Risk of biochar carryover between plots

Our current solution:

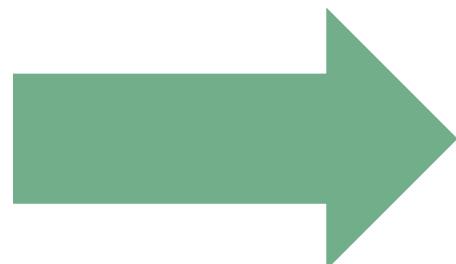
- Plowing along not across plots
- One direction a year
- Harvest plot in treated gross plot
 - Barrier to the sides and in both ends



Drone-foto from manure trial. Source: SEGES

Spreading biochar in field trials

Dose in dry weight or delivered product?



Source: Danish Technological Institute

Source: SEGES

SEGES
INNOVATION

Incorporation of biochar to soils

Consider main objective and general practice in agriculture

- No incorporation, no-till
Wind erosion?
- Ploughing
- Harrowing
- Rotary till
- Injection application with slurry
Lower amounts



When doing field trials with biochar...

... how do we consider the complexity and persistence of biochar as a soil amendment?



- Keep focus on the purpose of the trial
- Adjust the design to multiyear measures
- Comprehensive initial characterization
- Consider biochar properties in relation to other treatments

What else to add?

You become black...

Thank you for the attention!