

Digestate utilisation and soil fertility

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Who we are



Fields of research at the IASP

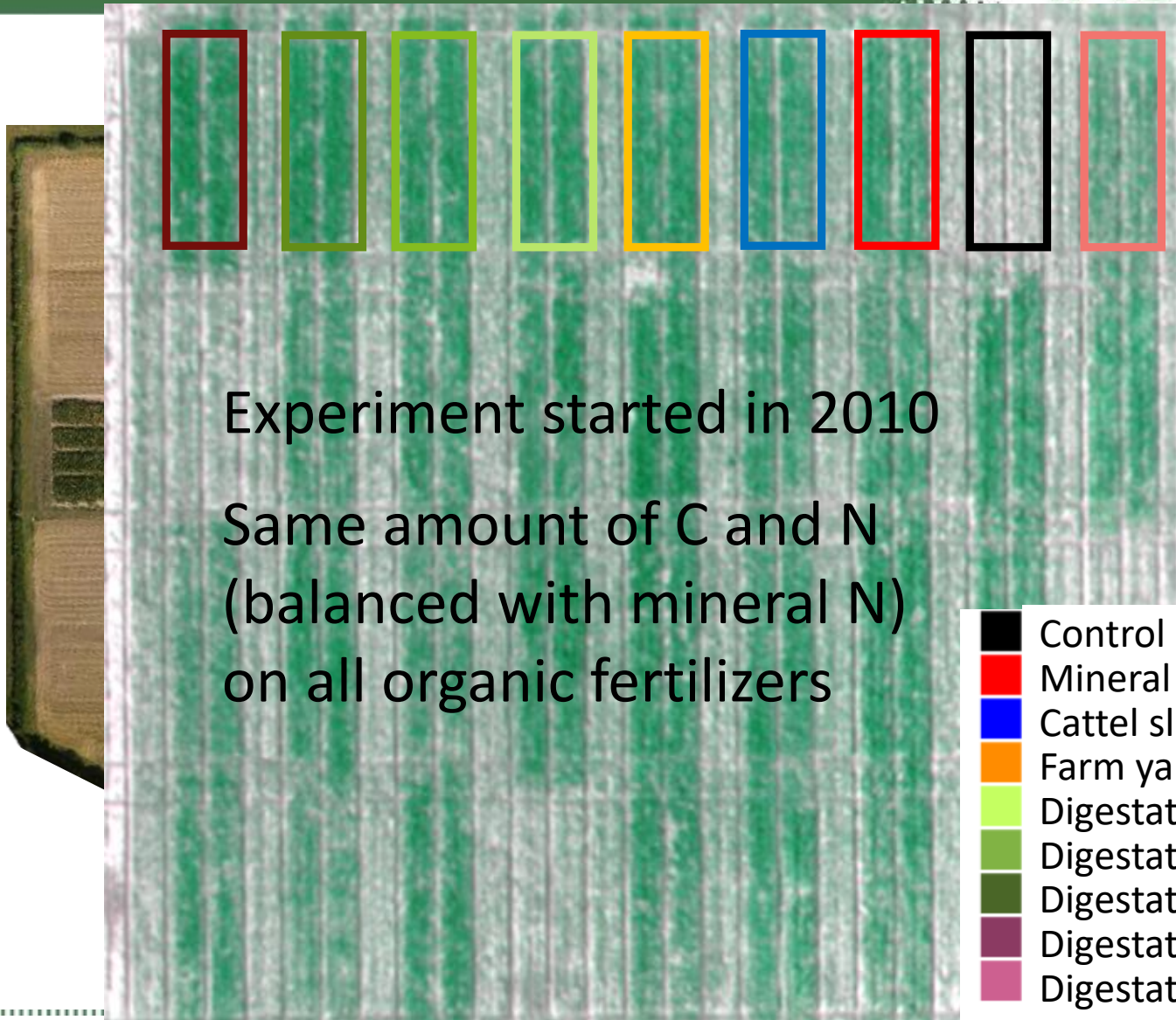
Field Experimental Station Berge, Brandenburg



Founded 1951

Research on
plants and soil

Many
experiments
with Biogas



Experiment started in 2010

Same amount of C and N
(balanced with mineral N)
on all organic fertilizers

- Control
- Mineral fertilizer
- Cattel slurry
- Farm yard manure
- Digestate cattle slurry
- Digestate pig slurry
- Digestate Crops
- Digestate mix solid
- Digestate mix liquid

Who we are



H2020 project: www.circularagronomics.eu



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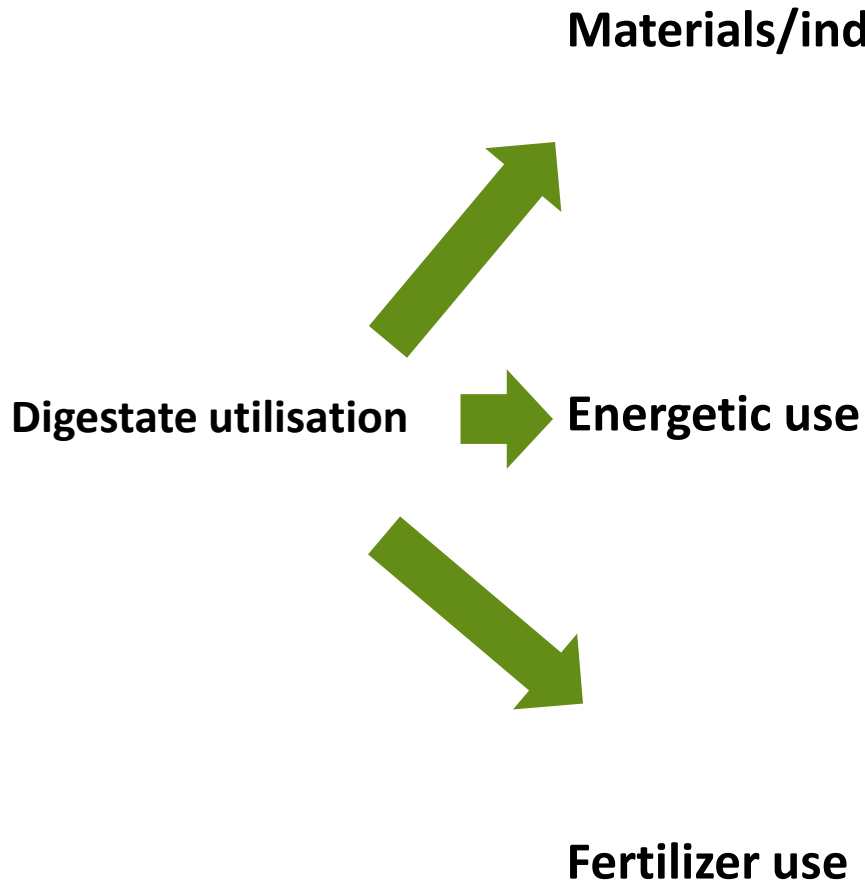
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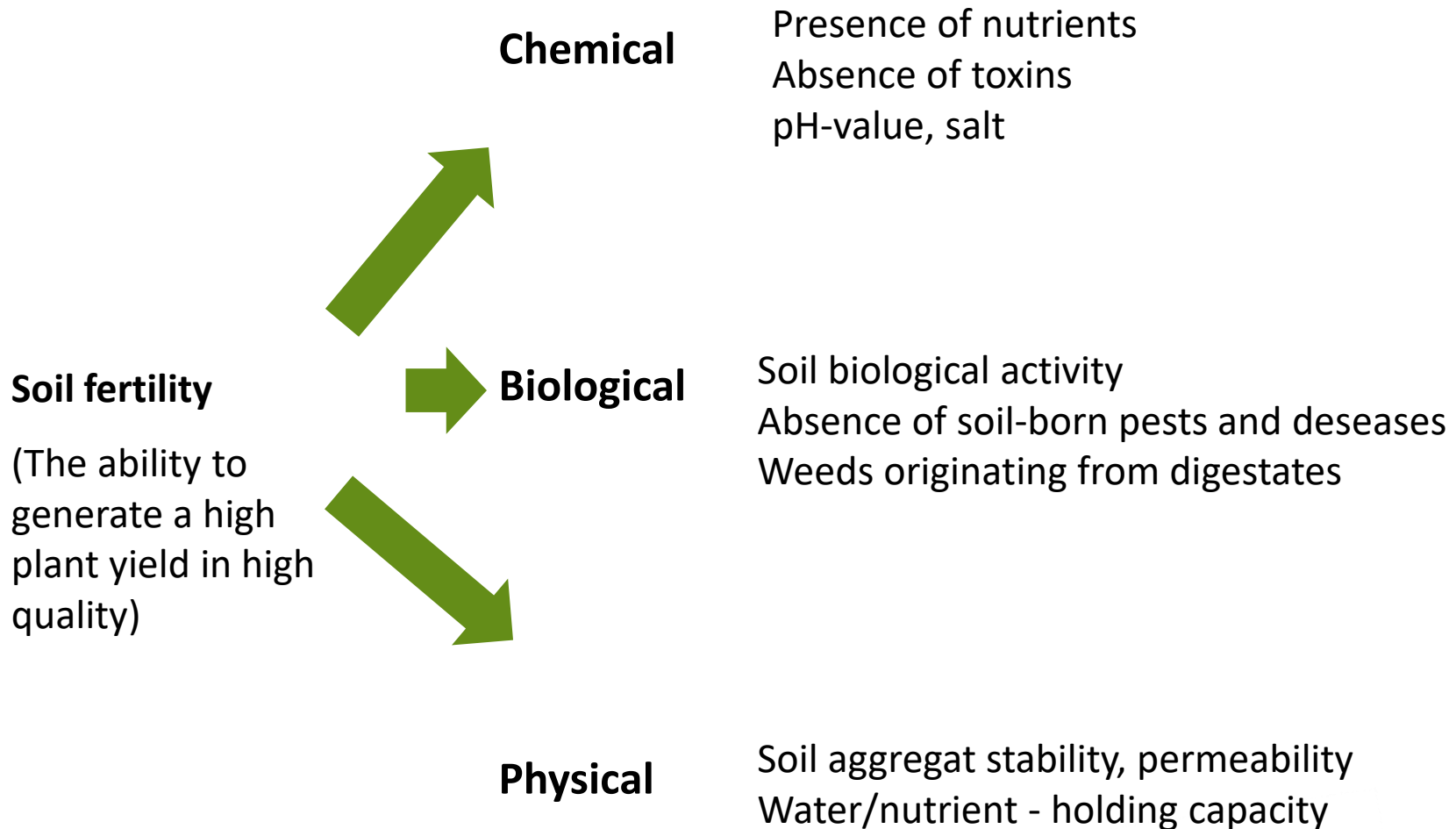


**digestate to
mineral fertilizer**

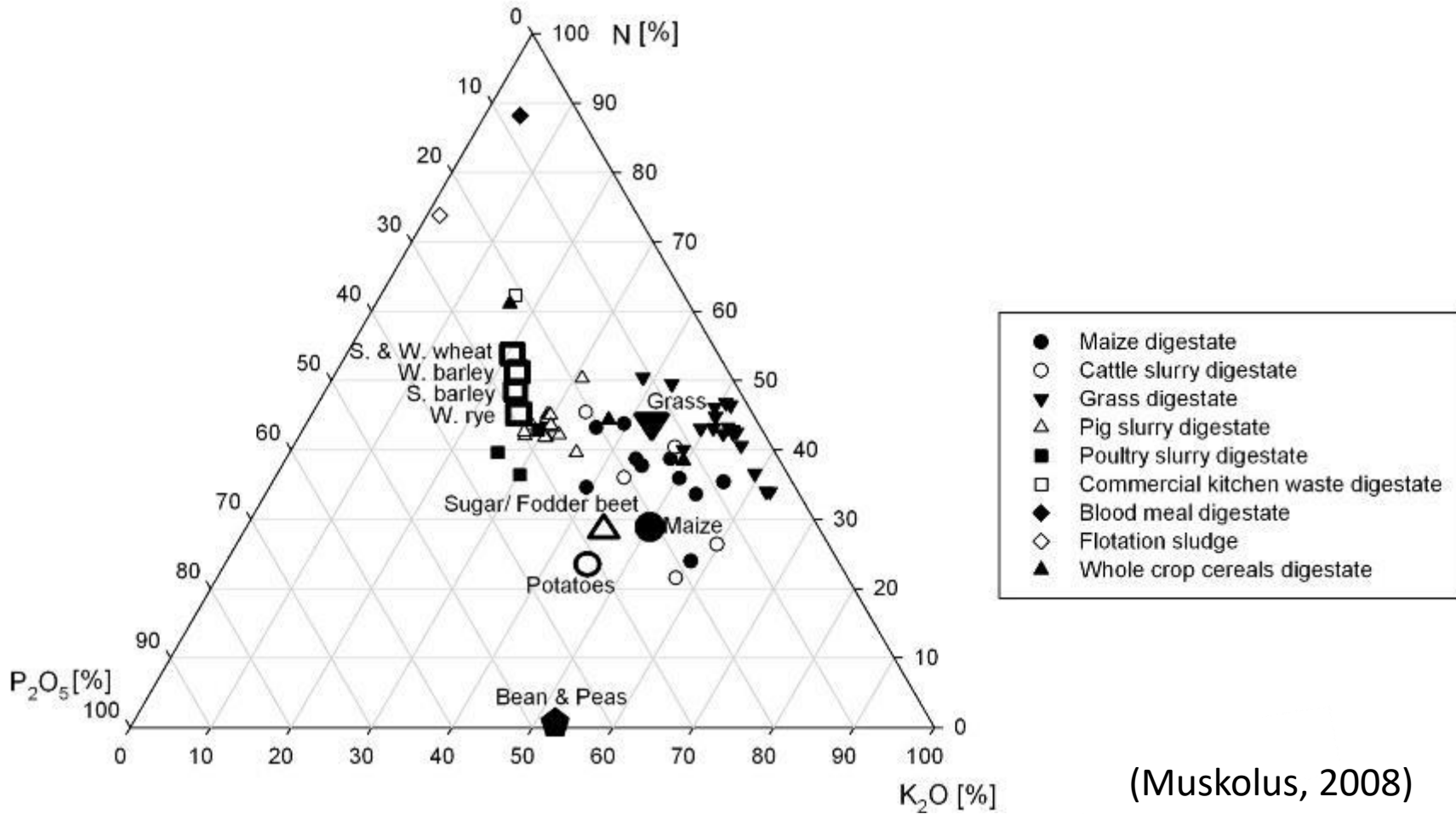


**digestate
application
technologies**



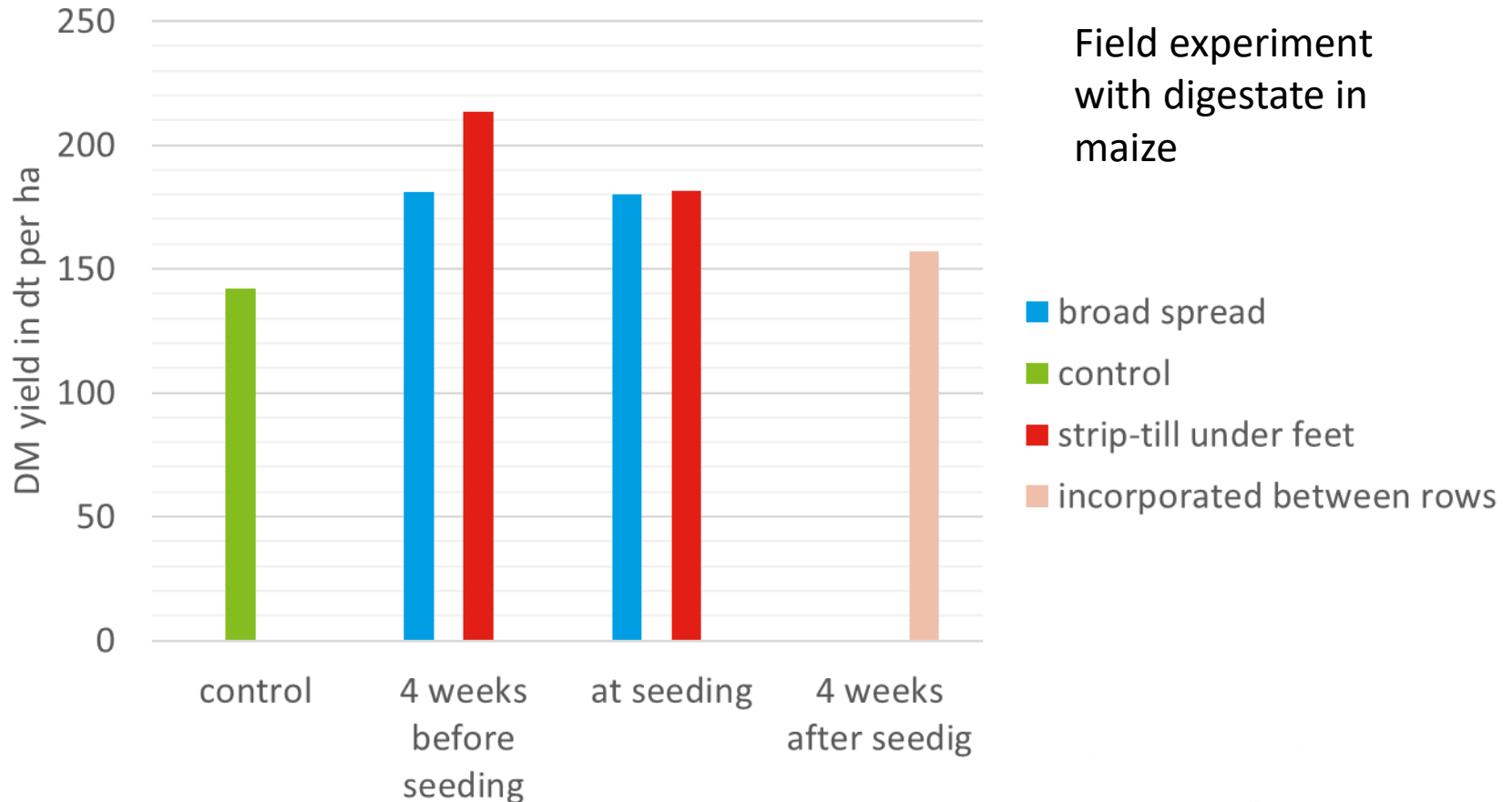


Relative nutrient compositions in digestates and crop requirements



(Muskolus, 2008)

For N uptake, timing and application method matters!



(Muskolus, 2019)

earthworms after digestate application



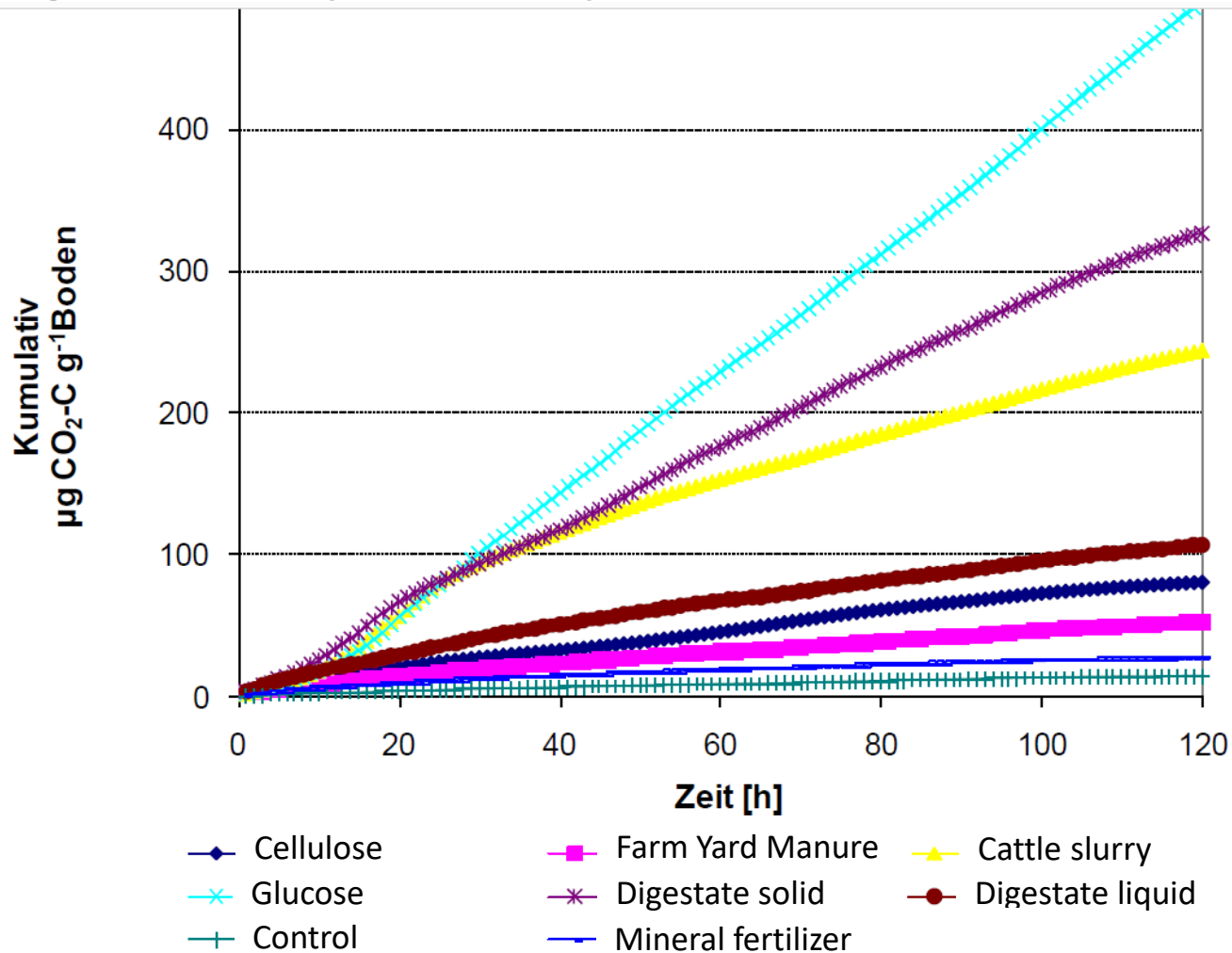
**Aviodance
Response Rest**

**Result:
At beginning strong
avoidance
but
higher abundance
in soil with
digestate after
some time**

Parameter	Unit	N0	N1	N2	N3
Abundance	[Indiv. m ⁻²]	148	117	114	108
Adulte	[Indiv. m ⁻²]	29	19	18	26
Juvenile	[Indiv. m ⁻²]	109	92	92	74
<i>A. caliginosa</i>	[Indiv m ⁻²]	50	43	38	48
<i>A. icterica</i>	[Indiv. m ⁻²]	74	59	60	49
<i>A. spec.</i>	[Indiv. m ⁻²]	17	11	14	8

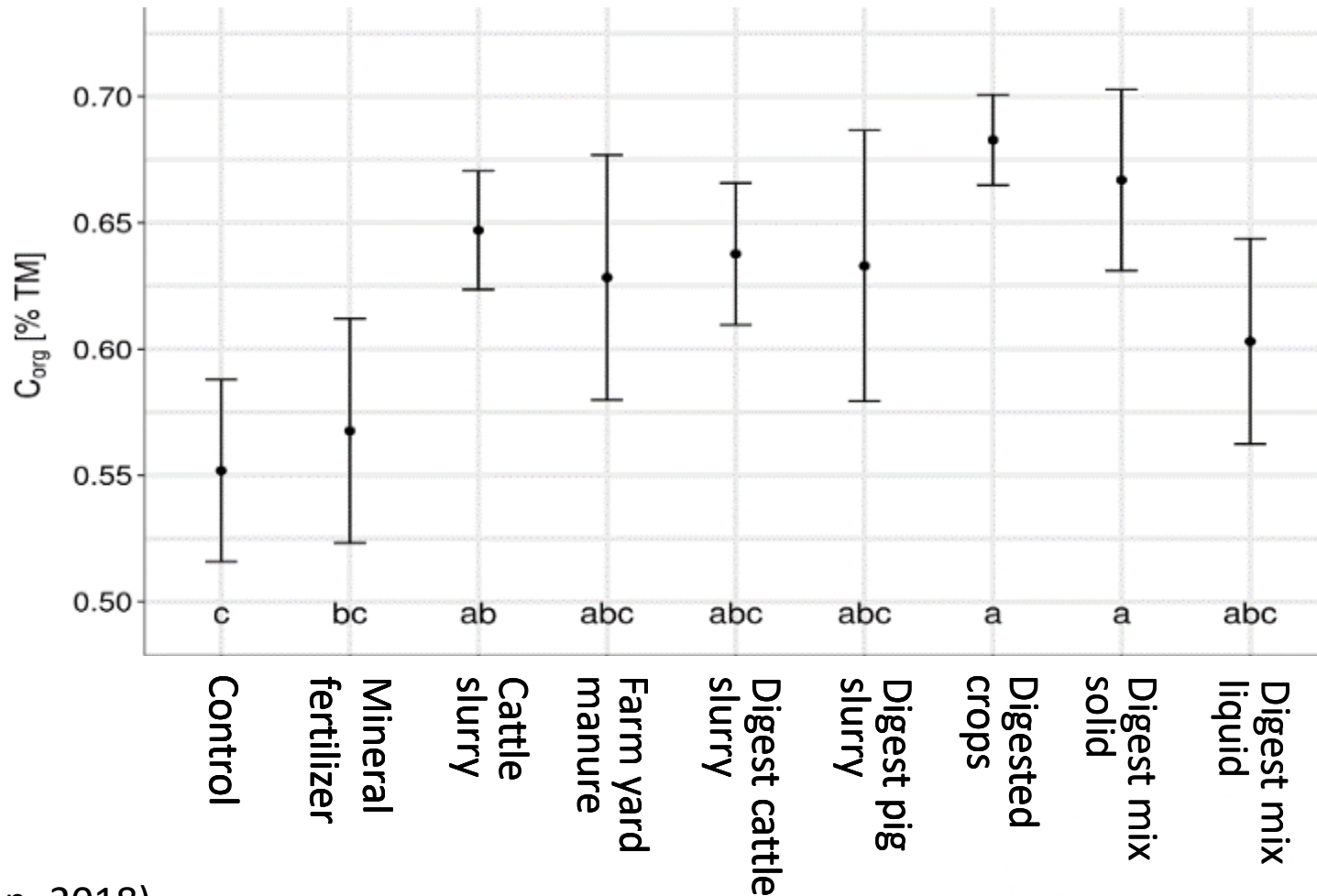
(Sensel–Gunke et al 2008)

Soil biological activity – soil respiration



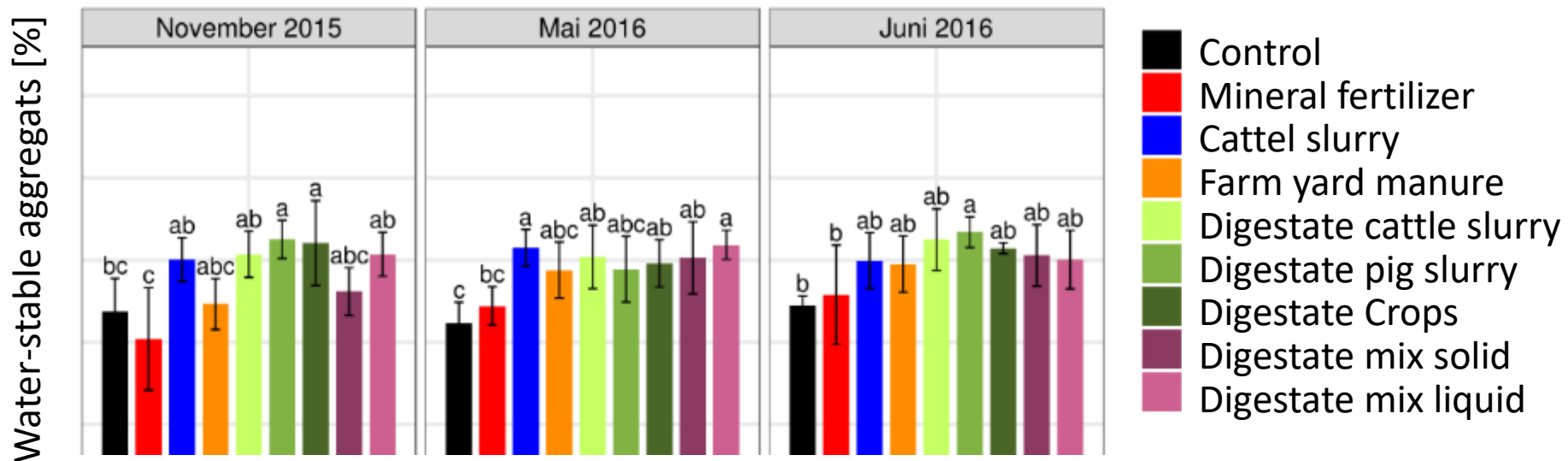
(Nielsen 2014)

Organic carbon in soil after 5 year fertilization with digestates



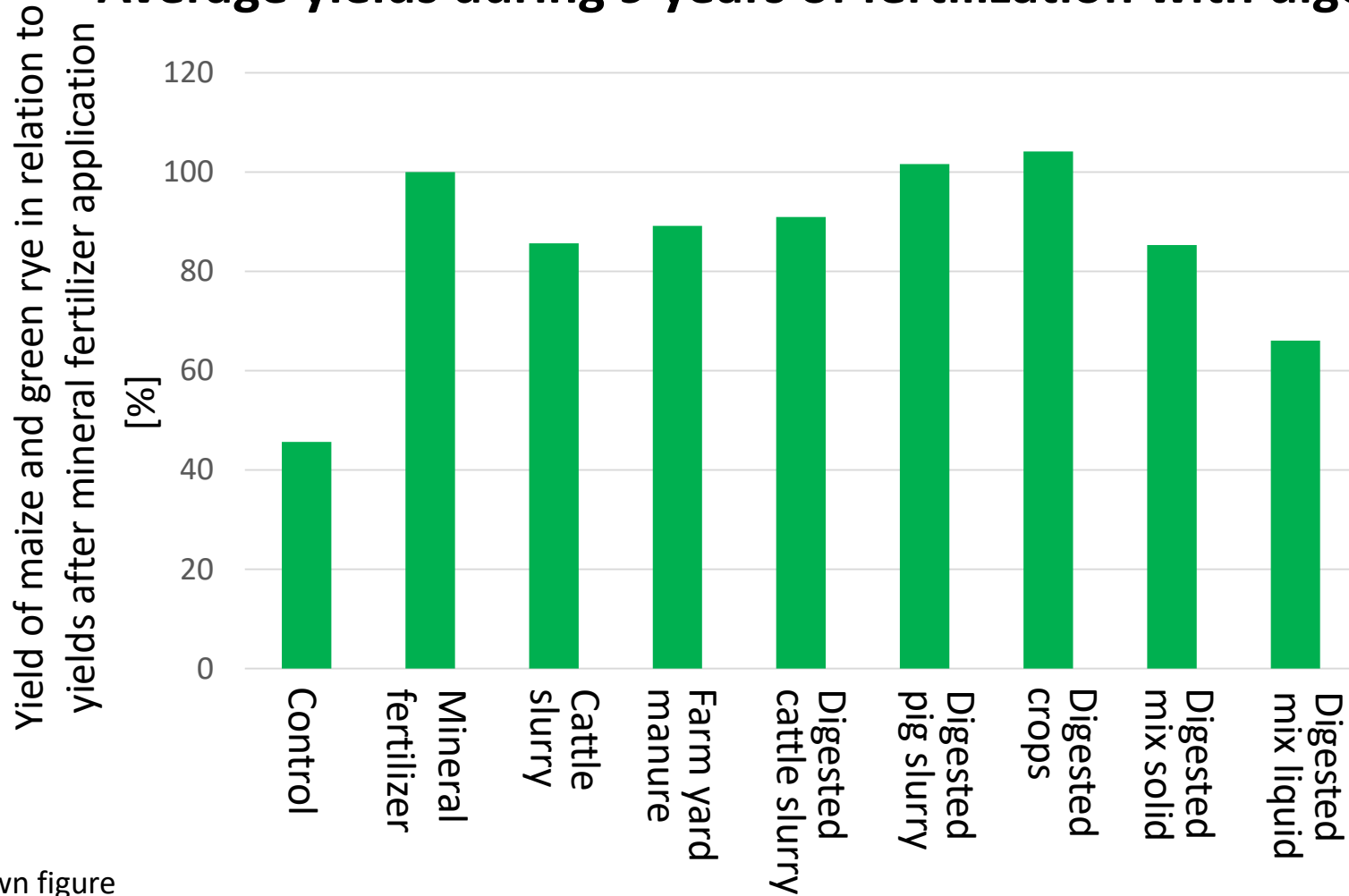
(Hofmann, 2018)

Soil Aggregat Stability after 5 year digestate application



(Hofmann, 2018)

Average yields during 9 years of fertilization with digestates



(Own figure unpublished)

Biogas digestates have effects on soil chemistry, biology, and physics

If applied correctly, they can raise soil fertility

... and can improve crop yields

Thank you very much for your attention!