UNIKASSEL VERSITÄT | ÖKOLOGISCHE AGRAR WISSENSCHAFTEN

Experimental results on the effect of bio-dyn. preparations

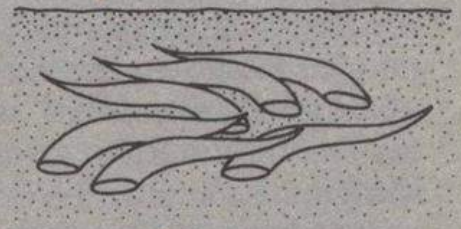
1. **Exact Experiments / Universities**
   -> measure, count, weigh
2. **Pictures forming methods**
   -> experience -> training of qualitative perception
1. **Conclusions**
   -> personal relationship?

Dr. Jürgen Fritz
Fachgebiet Ökologischer Land- und Pflanzenbau

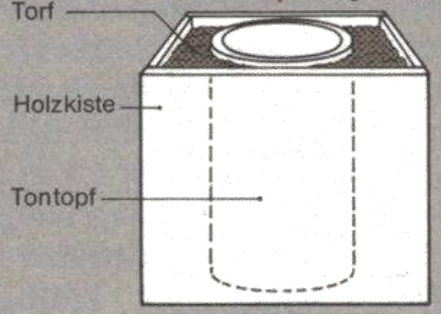
Hornmistpräparat

1
in ausgesuchte
Kuhhörner einfüllen

2
im Herbst in belebten
Boden eingraben



3
im Frühjahr
ausgraben

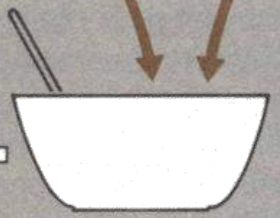


Weiterverarbeitung wie
Hornkieselpräparat → 8 - 9

Hornkieselpräparat

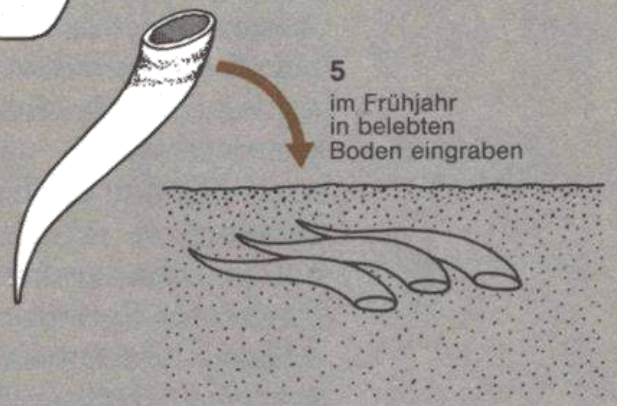
1

2



3
zu einem gerade
noch fließenden
Brei verrühren

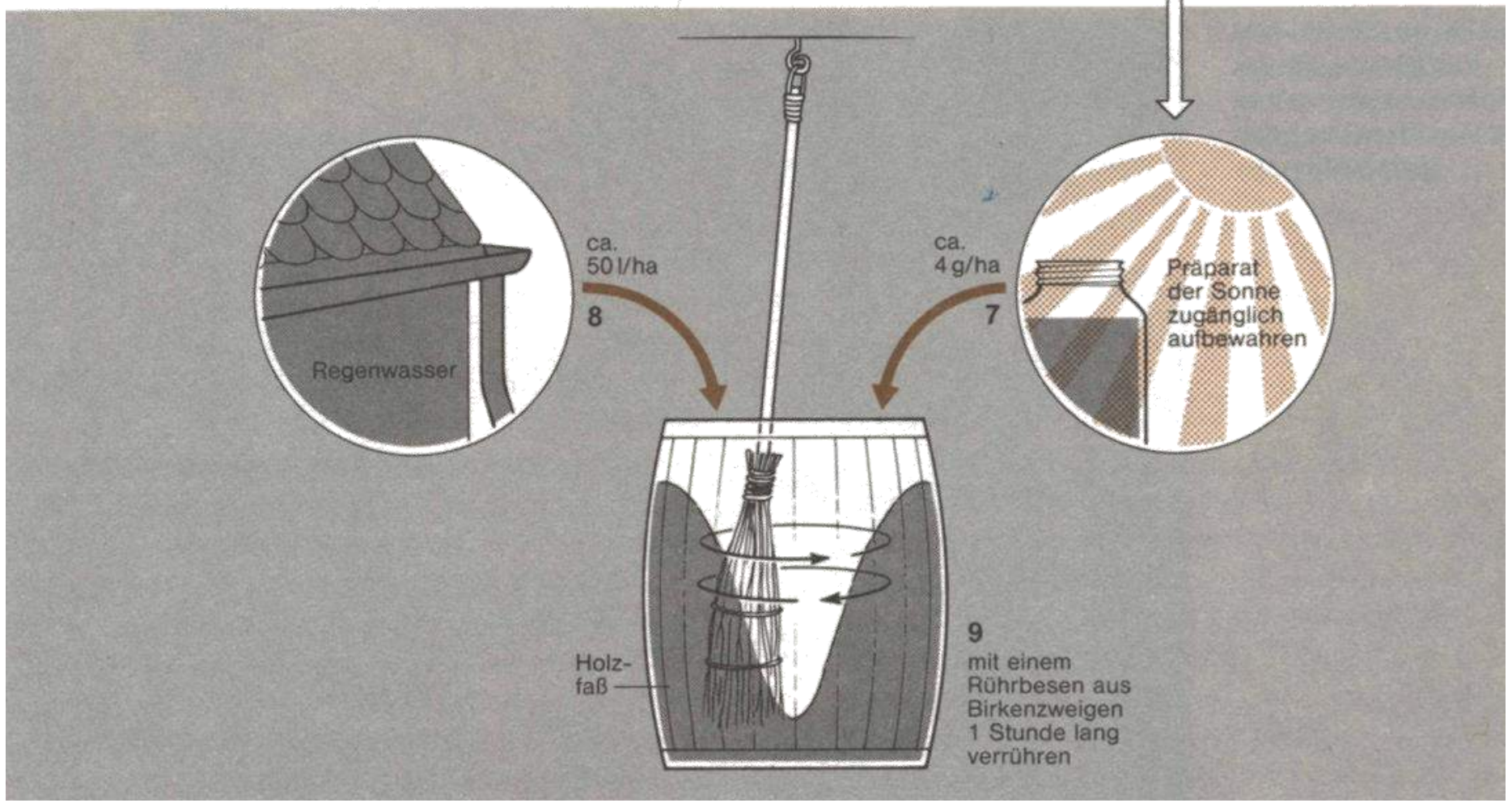
4
in ausgesuchte
Kuhhörner einfüllen



5
im Frühjahr
in belebten
Boden eingraben

6
bei Herbstbeginn
ausgraben

IOL
Institut für Organischen Landbau
Universität Bonn



IOL
Institut für Organischen Landbau
Universität Bonn

Questions

- Effect?
- What effect?

Development goals

=> Increase of resilience / self-organization

- vitalization of fertilizer and soil
- plant health
- food quality

Präparat 500

Hornmanure

Basic substance:	cow dung
Preparation in:	Cow horn
Season:	over winter
Effect:	Stimulation of soil processes

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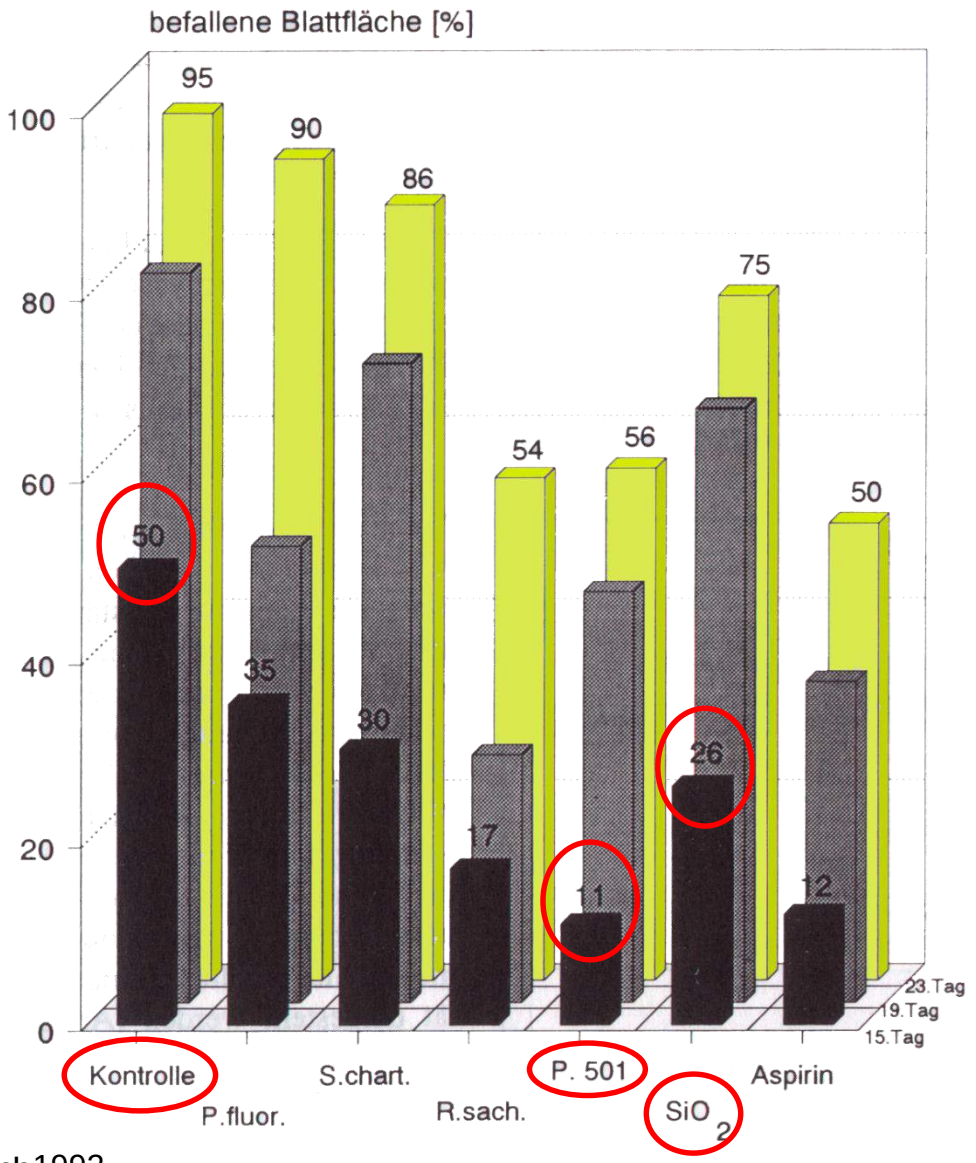
Präparat 501

Hornsilica

Part used:	crystalline quartz as flour
Preparation in:	Cow horn
Season:	over summer
Effect:	Stimulation plant-physiological processes

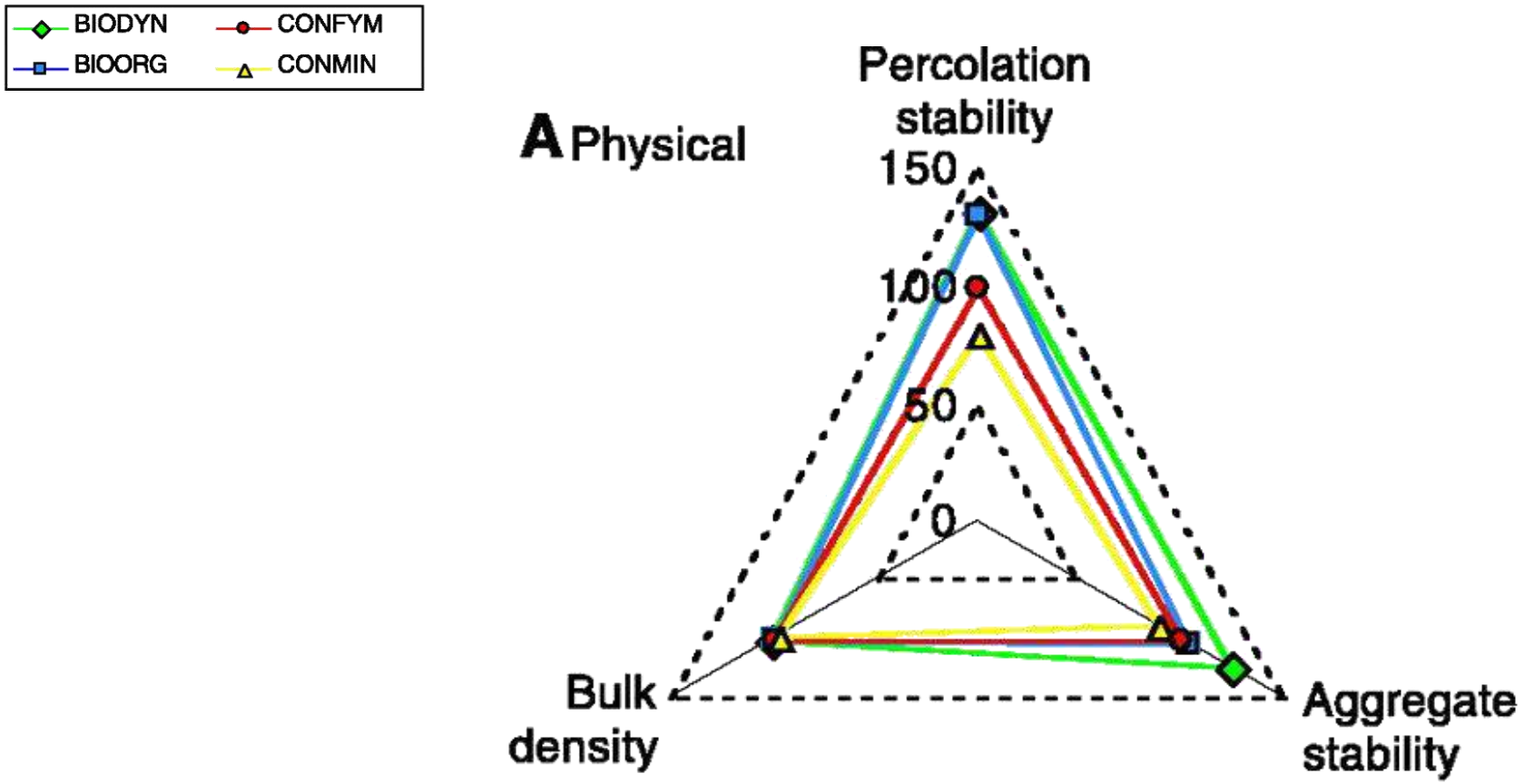
Powdery mildew (S. fuliginea) on cucumber leaves after preventative treatment with resistance indicators



=> Chitinase-aktivity

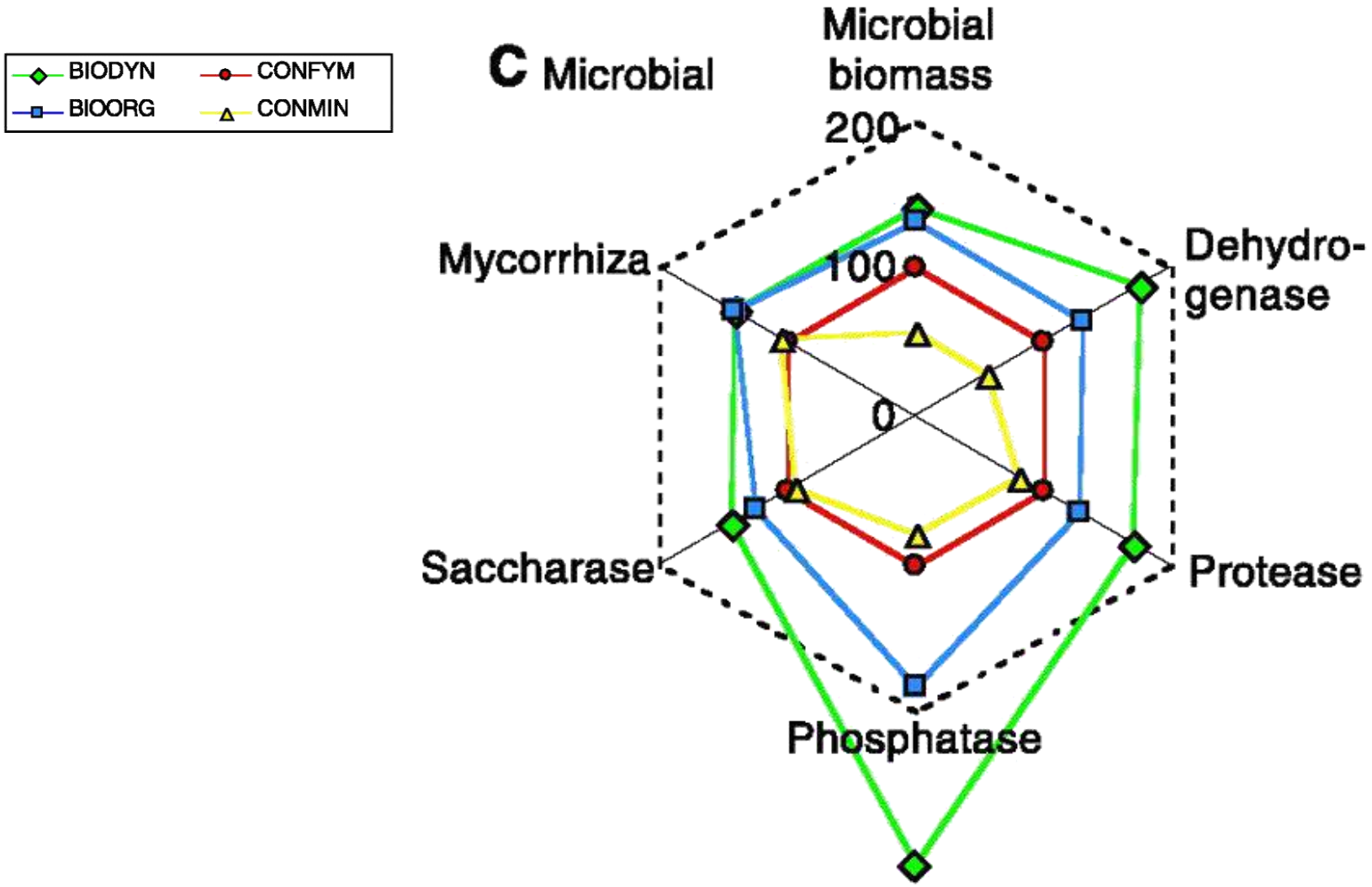
S.Schneider u. W.R. Ullrich1992

Physical soil properties in soils of the DOK farming systems



(Mäder et al. 2002)

Biological soil properties in soils of the DOK farming systems



(Mäder et al. 2002)

Questions

- Effect? **-> yes**
- What effect?

Development goals

=> Increase of resilience / self-organization

- vitalization of fertilizer and soil
- plant health
- food quality

Exakt-Versuche zu Präparaten

Doktor-Arbeiten:

ABELE (1973), SPIEß (1978), SAMARAS (1978),
FETSCHER (1979), KOTSCHI (1980), SAMARAS (1981),
LÜCKE (1982), EL SAIDY (1982), MOLL (1985),
TEGETHOF (1987), KÖNIG (1988), HERMANNS-SELLEN (1989),
SCHNEIDER-MÜLLER (1991), BACHINGER (1996),
FRITZ (2000), ATHMANN (2011), MEIßNER (2015),
JUKNEVIČIENĖ (2015) VAITKEVIČIENĖ (2016)

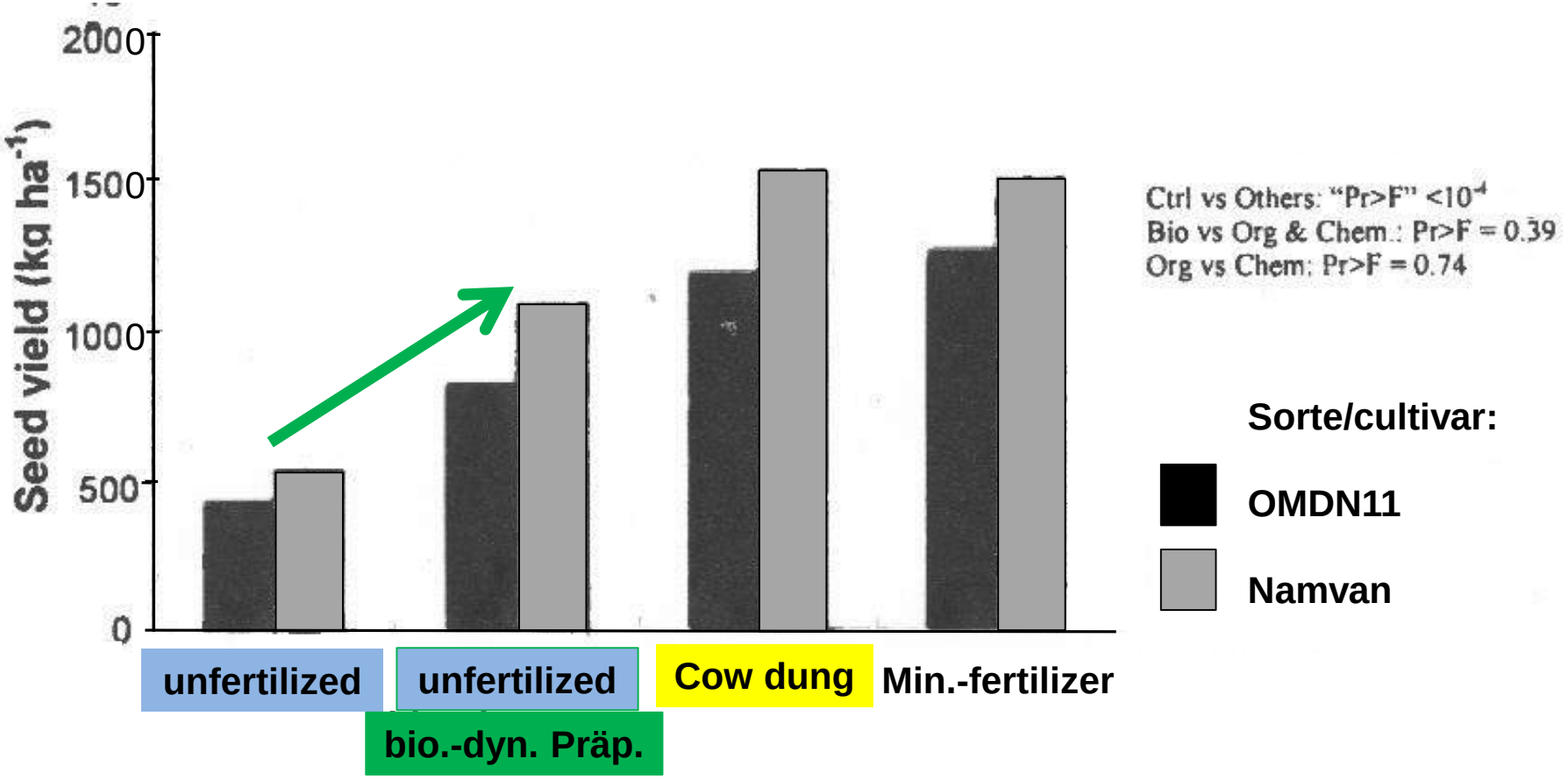
Dauerdüngungsversuche - Schweiz und Deutschland:

MÄDER et al. (2002), MÄDER & RAUPP (1995)

Veröffentlichungen in wissenschaftlichen Zeitschriften:

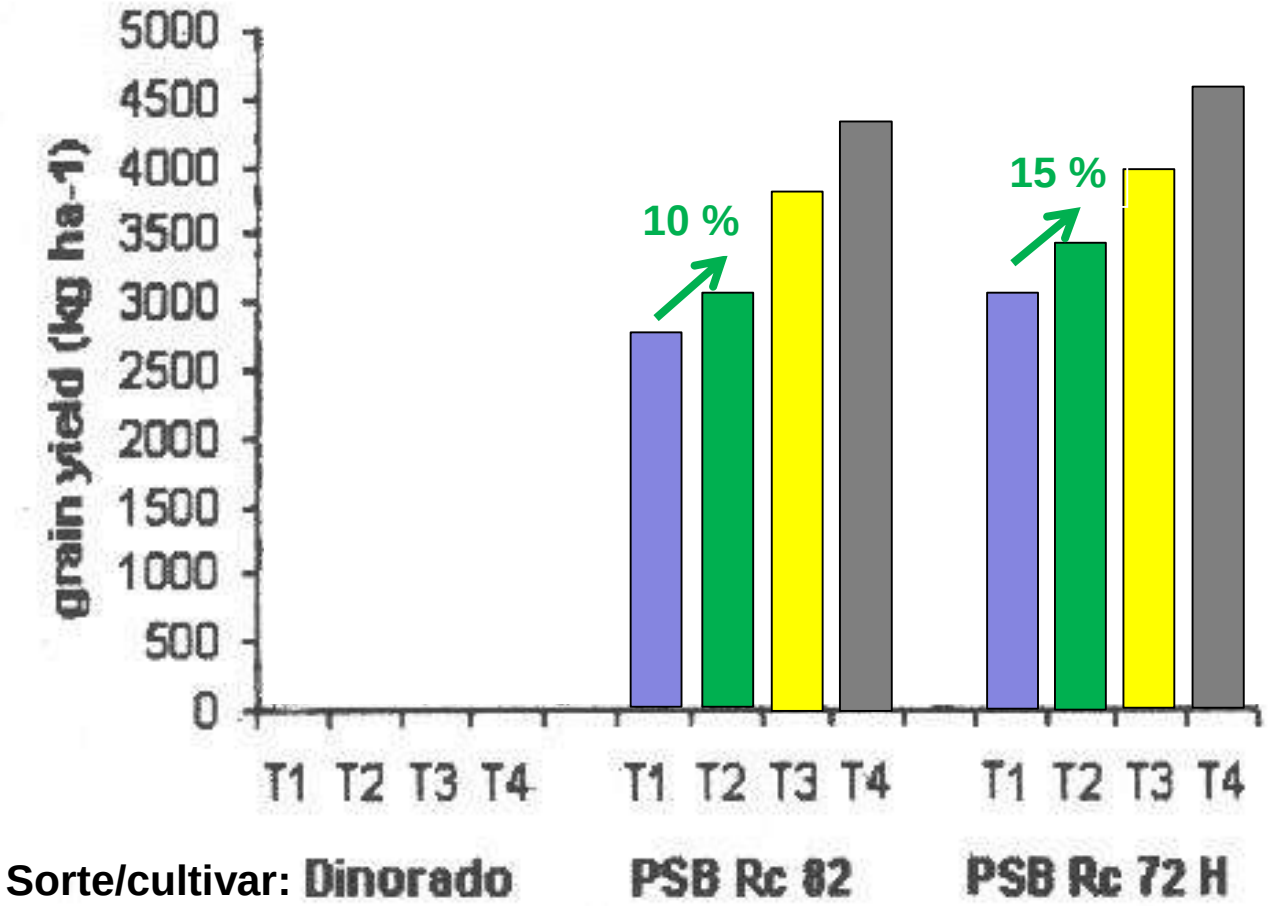
JAYASREE & GEORGE (2006) TUNG & FERNANDES (2007)
VALEZ & FERNANDES (2008) BACCHUS et al. (2010)
REEVE et al. (2010) SHARMA et al. (2012)
SPACCINI et al. (2012) TRIVEDI et al. (2013)
GIANNATTASIO et al. (2013) und weitere …

Seed yield of soybeans in the Mekong Delta / Vietnam



(Tung & Fernandes 2007)

Yield of rice in the Philippines



T1: unfertilized

T2: unfertilized

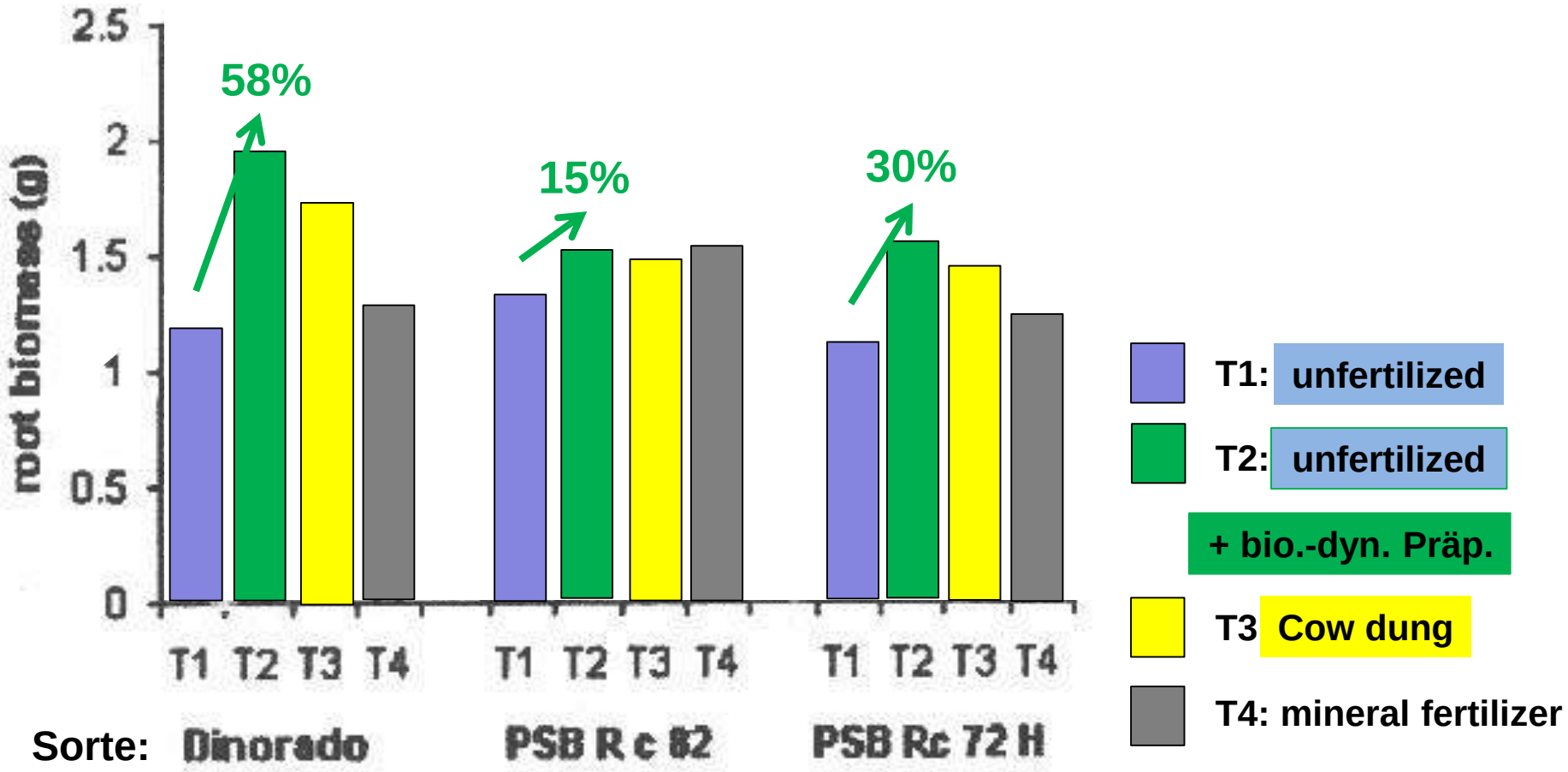
+ bio.-dyn. Präp.

T3 Cow dung

T4: mineral fertilizer

(Valez & Fernandes 2008)

Wurzelbiomasse von Reis auf den Philippines



(Valez & Fernandes 2008)

Edita Juknevičienė

Great pumpkin plant, fruit and seeds of cv. ‚Amazonka‘ (author‘s photos)

Kürbis/ Pumpkin in 2012–2014

	Not sprayed	Sprayed with P 500
	130 days	
Urease activity (mg NH_3 1 g soil 24 h^{-1})	0.28 a	0.54 b
Sacharasse activity (mg glucose 1 g soil 48 h^{-1})	33.22 a	35.00 b

(Juknevičienė 2015)

Kartoffeln/ Potatoes in 2013–2015

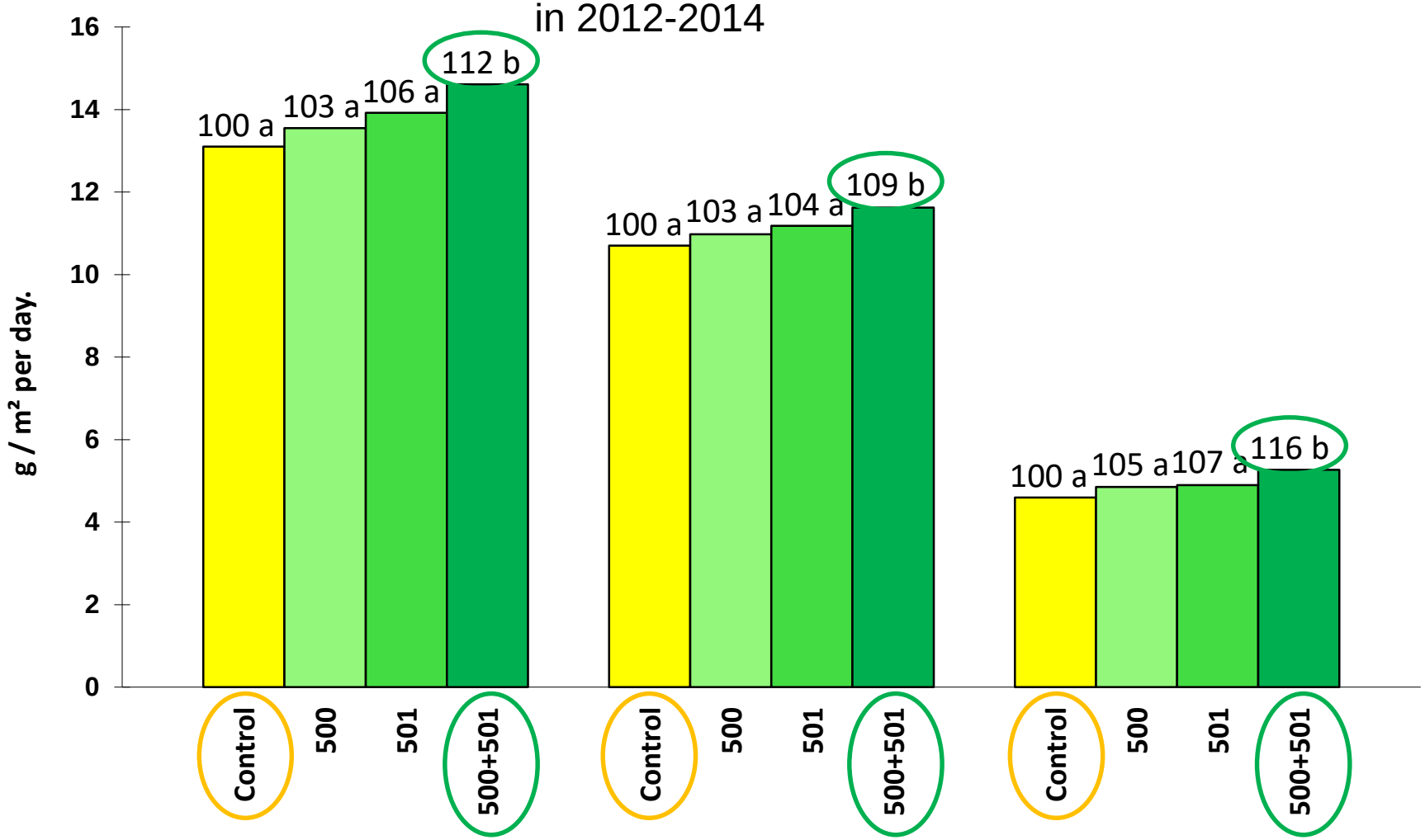
	Not sprayed	Sprayed with P 500
	126 days	
Urease activity (mg NH_3 1 g soil 24 h^{-1})	0.37 b	0.52 a
Sacharasse activity (mg glucose 1 g soil 48 h^{-1})	32.60 b	37.73 a

(Vaitkevičienė 2016)

Note: different a, b are significant, p≤0.05.

P 500 = Hornmanure / Hornmist

Net photosynthetic productivity – **pumpkin (Kürbis)** in 2012-2014

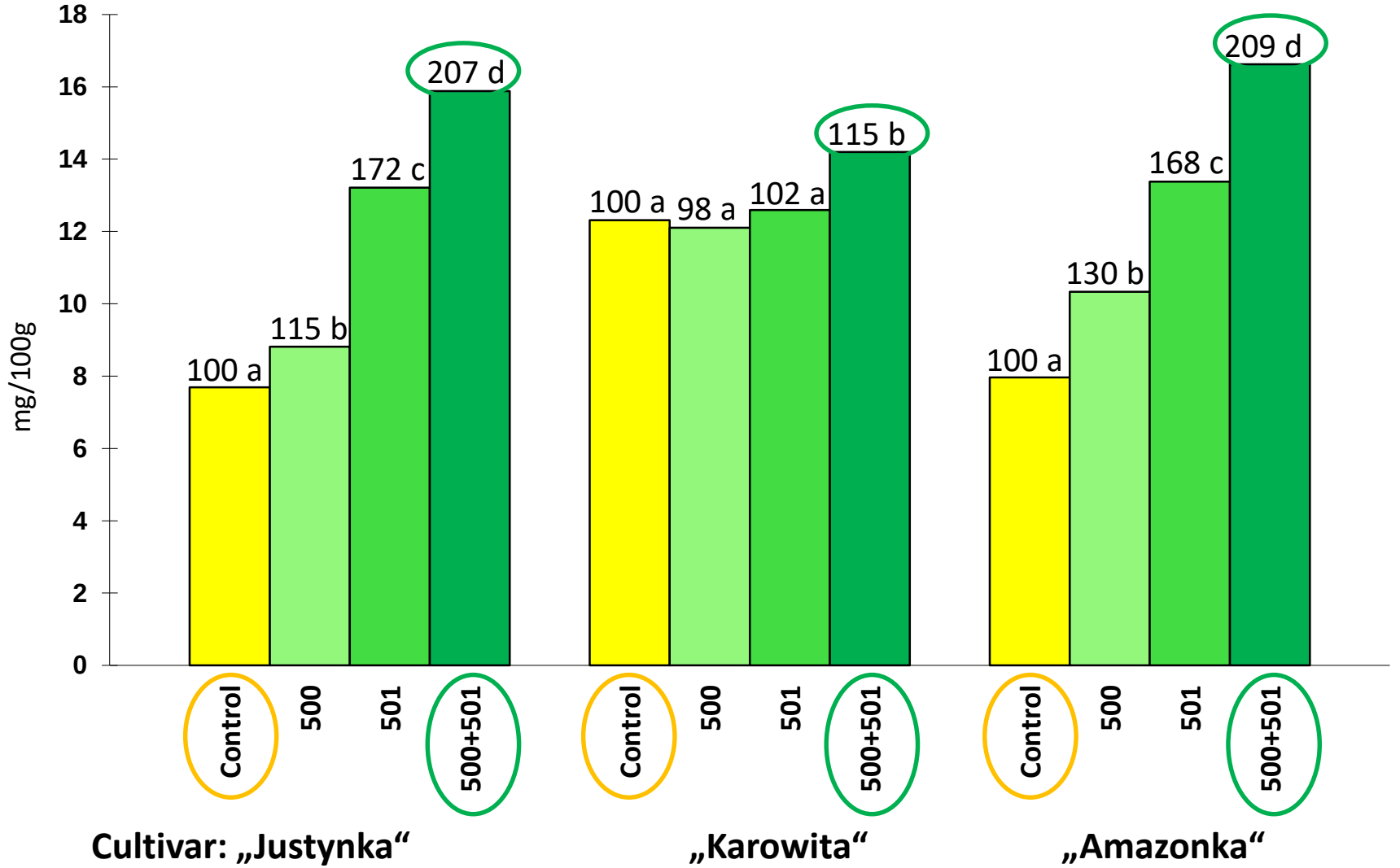


Note: different a, b, c are significant, p≤0.05.

500 = Hornmanure/Hornmist
501 = Hornsilica/Hornkiesel

(Juknevičienė 2015)

Antioxidants lutein and zeaxanthin – **pumpkin (Kürbis)**
in 2012-2014



Note: different a, b, c are significant, p≤0.05.

500 = Hornmanure
501 = Hornsilica

(Juknevičienė 2015)

Questions

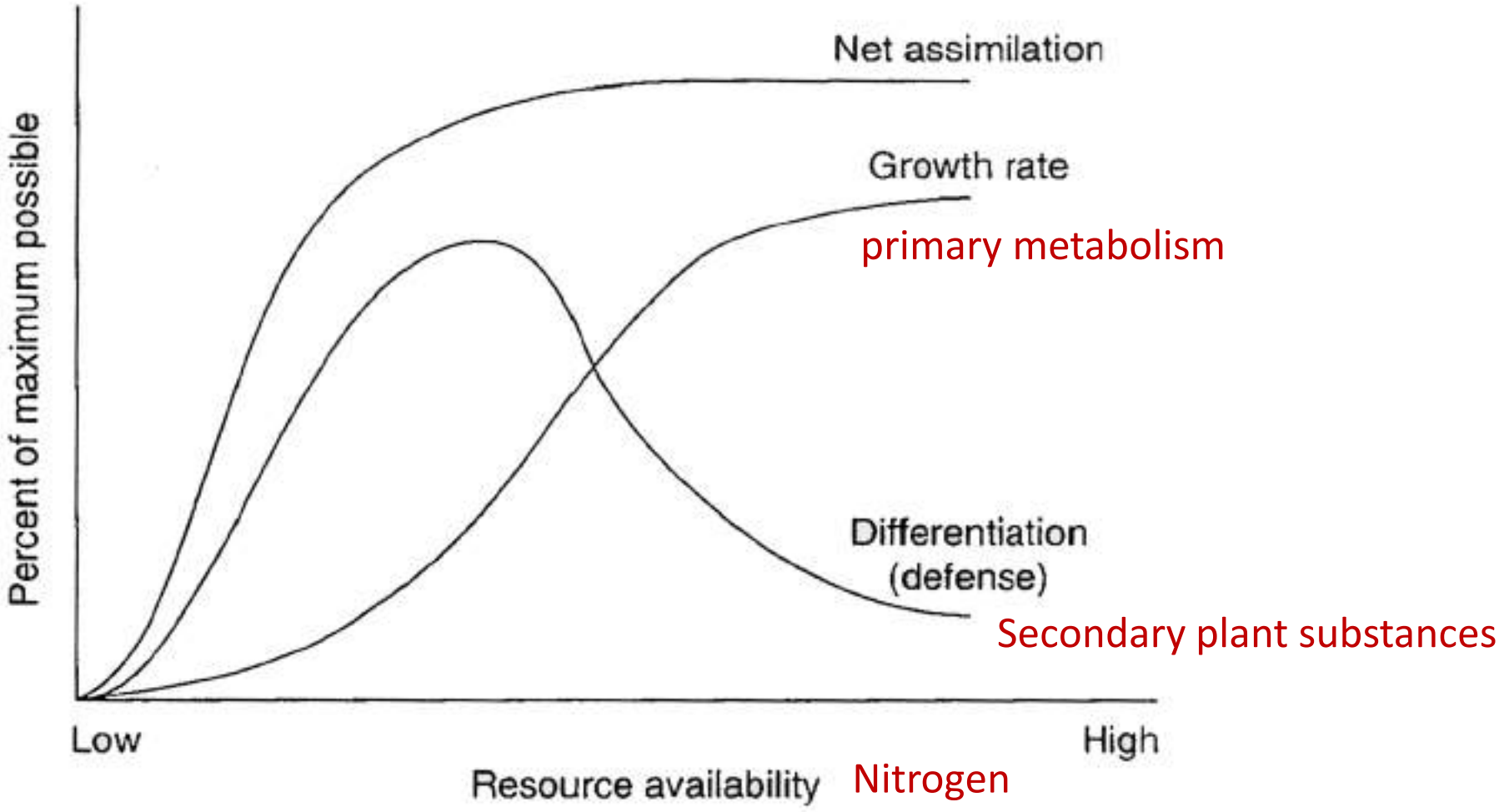
- Effect? **-> yes**
- What effect?

Development goals

=> Increase of resilience / self-organization *-> yield*

- vitalization of fertilizer and soil -> *Enzyme activity Root growth*
- plant health
- food quality -> antioxidanst

Growth-differentiation balance Hypothese



Lerdau et al. 2004

InBioDyn experiment Uni-Geisenheim

Rebe (vine) shoot length growth 2008

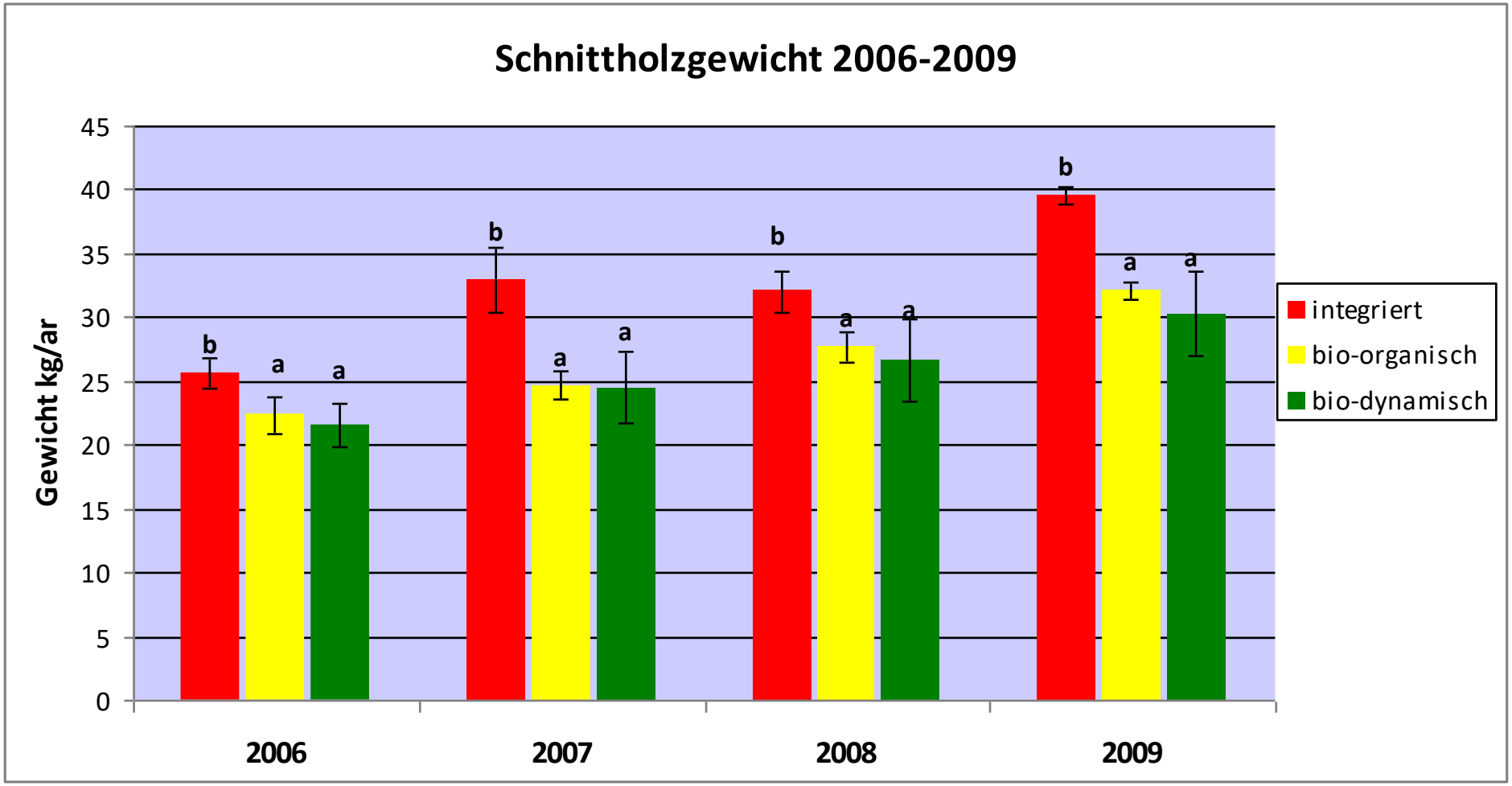
Integriert /conventional

Bio-org /organic

Bio-dyn

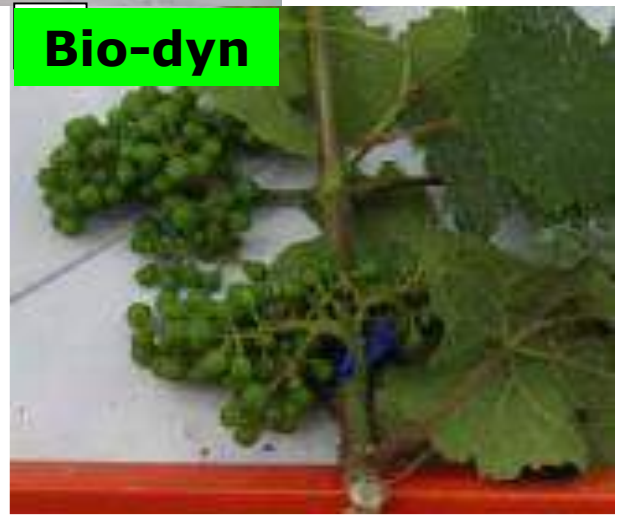
(Meissner 2015)

Holzgewichte (bunch weight) 2006-2009



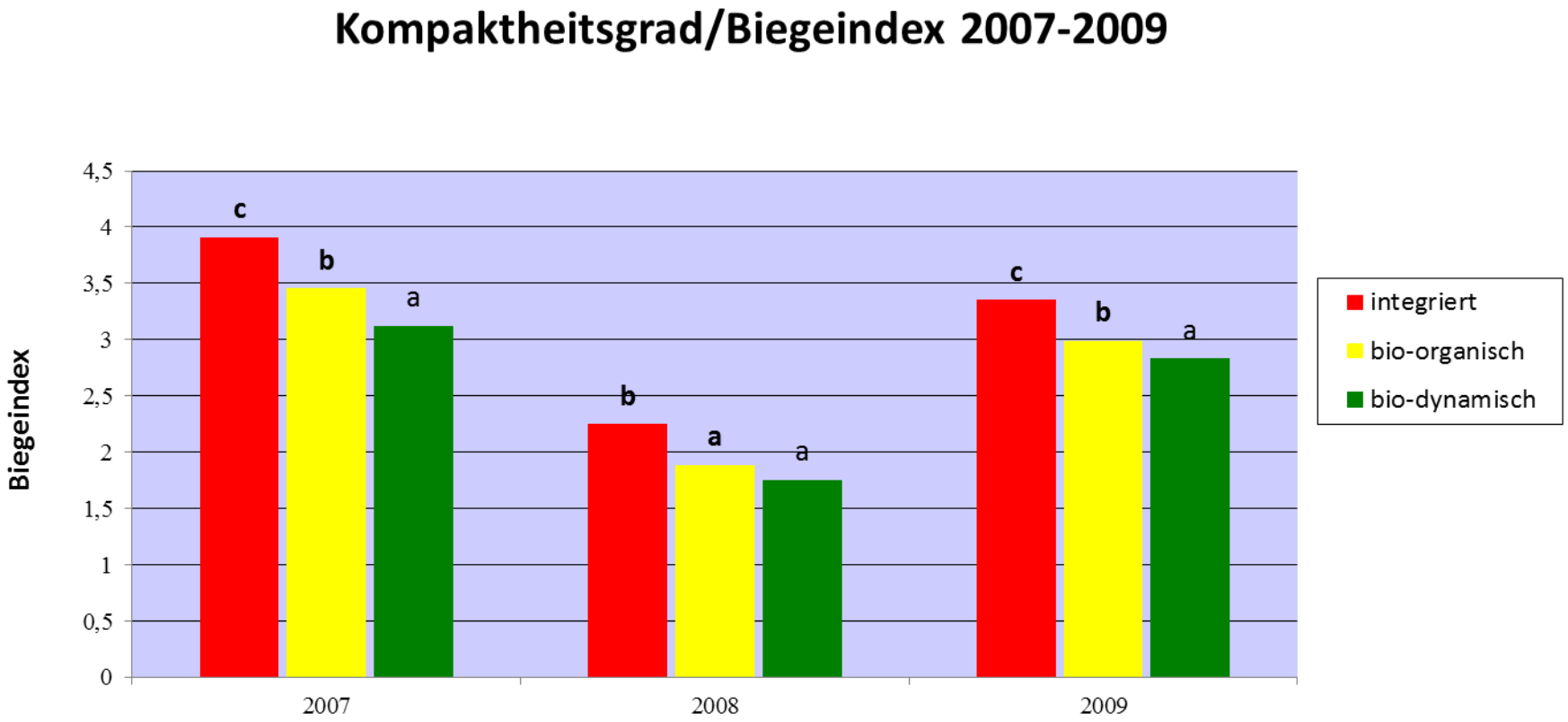
(Meissner 2015)

DEGREE OF COMPACTNESS
(BENDING INDEX)



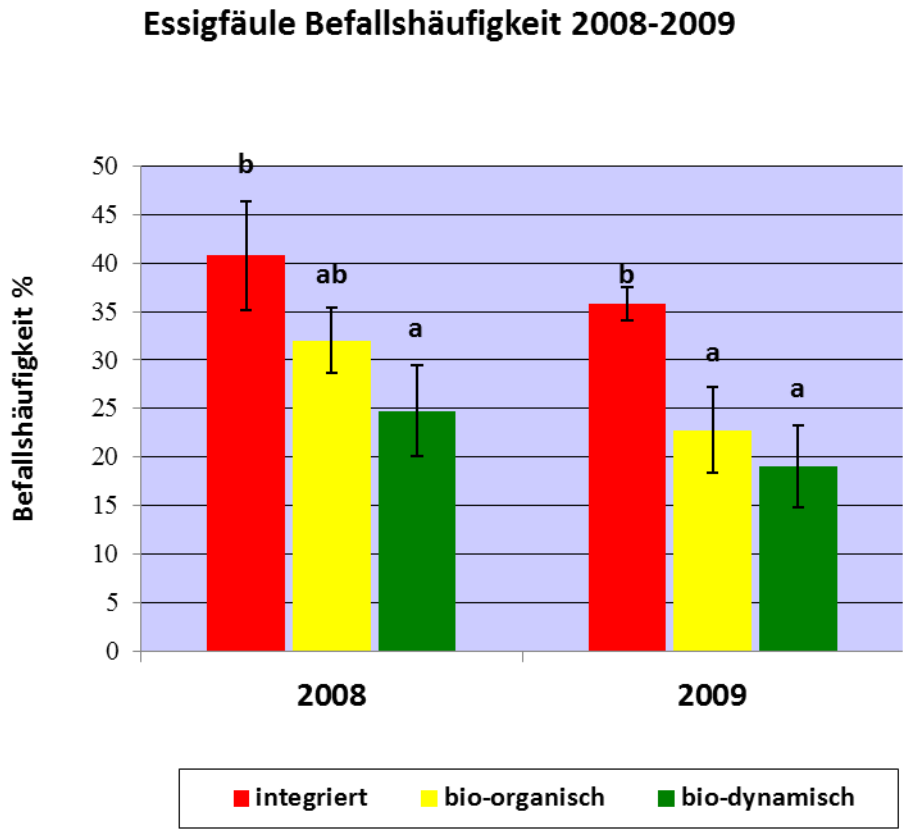
(Meissner 2015)

DEGREE OF COMPACTNESS
(BENDING INDEX)



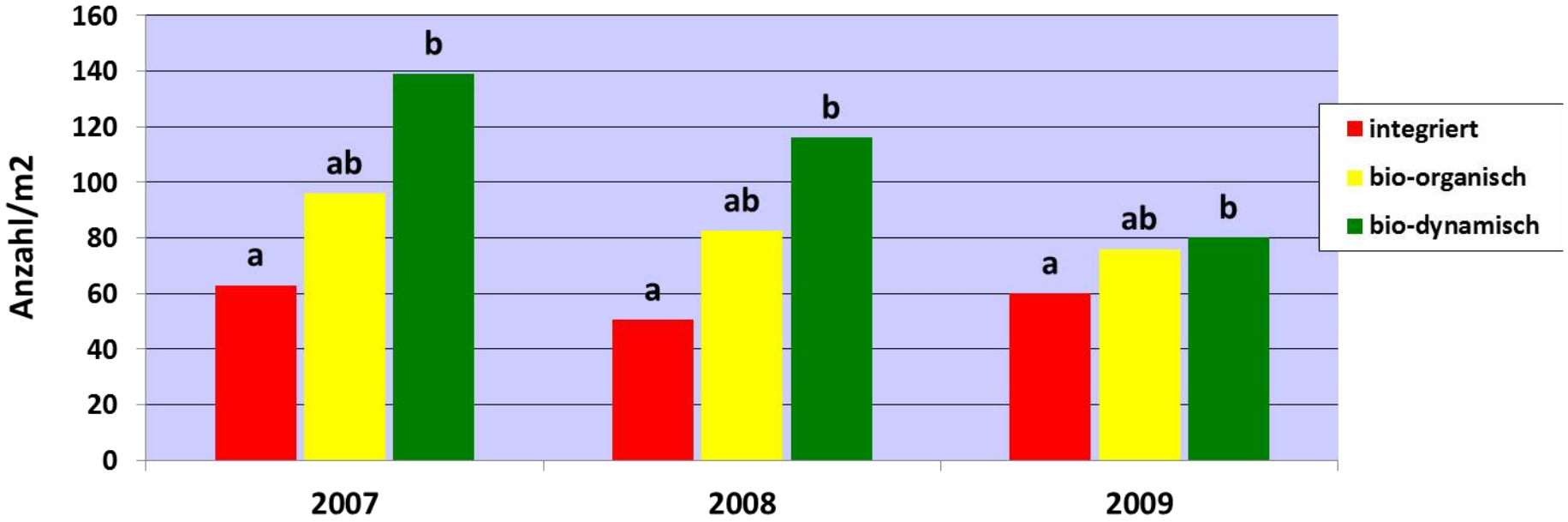
(Meissner 2015)

Essigfäule (sour rot) 2008-2009

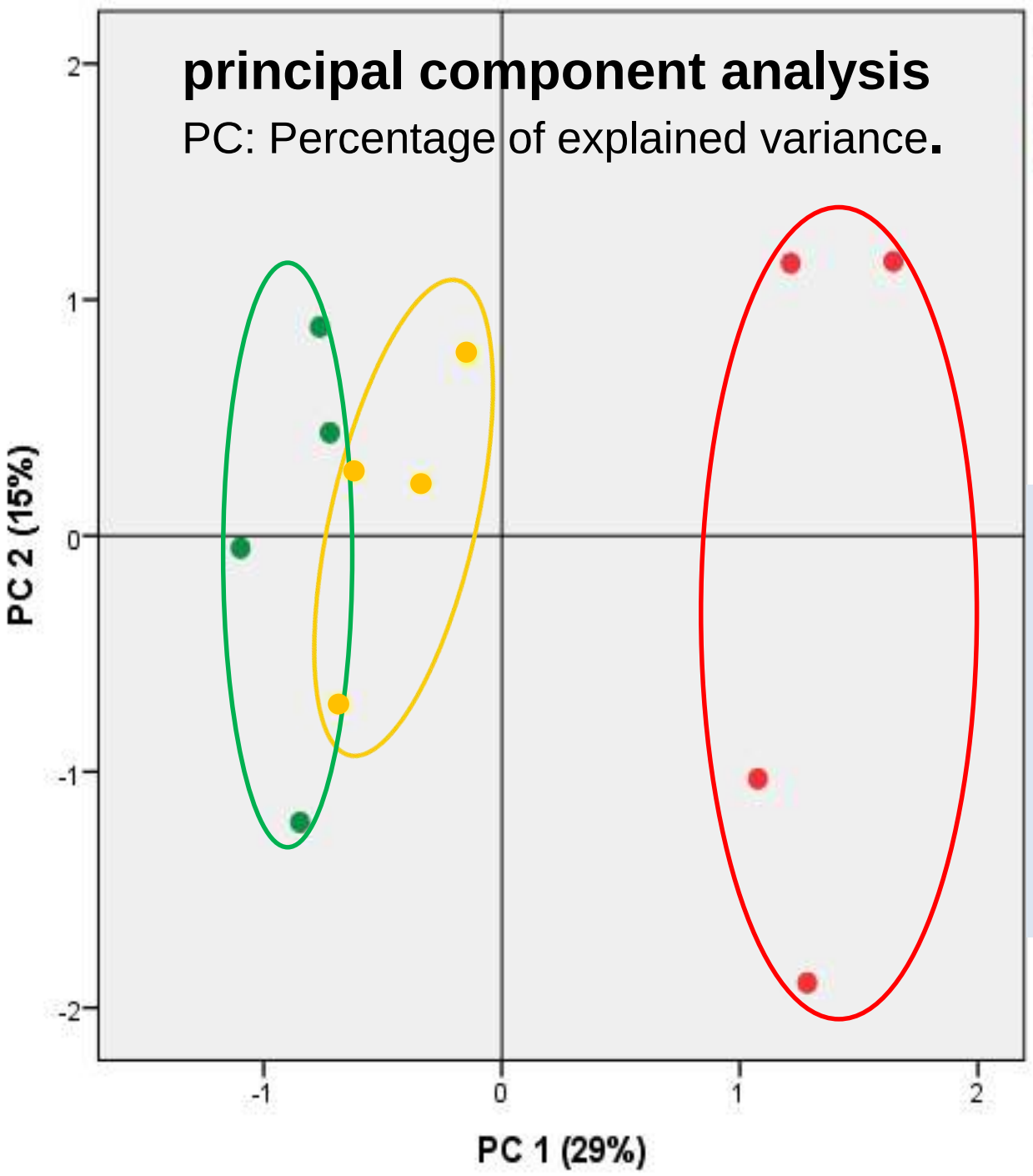


(Meissner 2015)

Number of earthworms 2007-2009



(Meissner 2015)



PC 1

- vegetative growth
- generative growth
- compact grapes
- sour red infestation

(Meissner 2015)

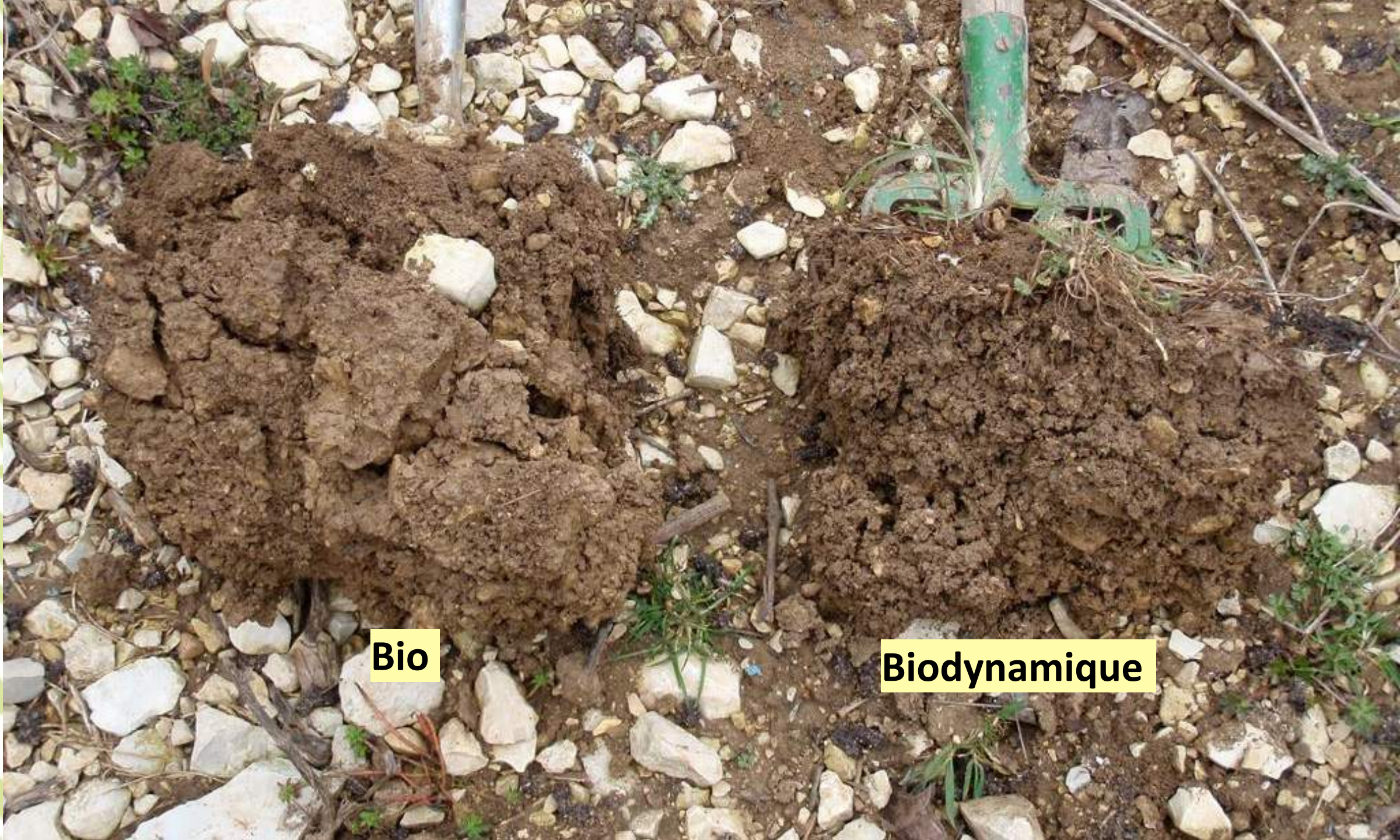
Questions

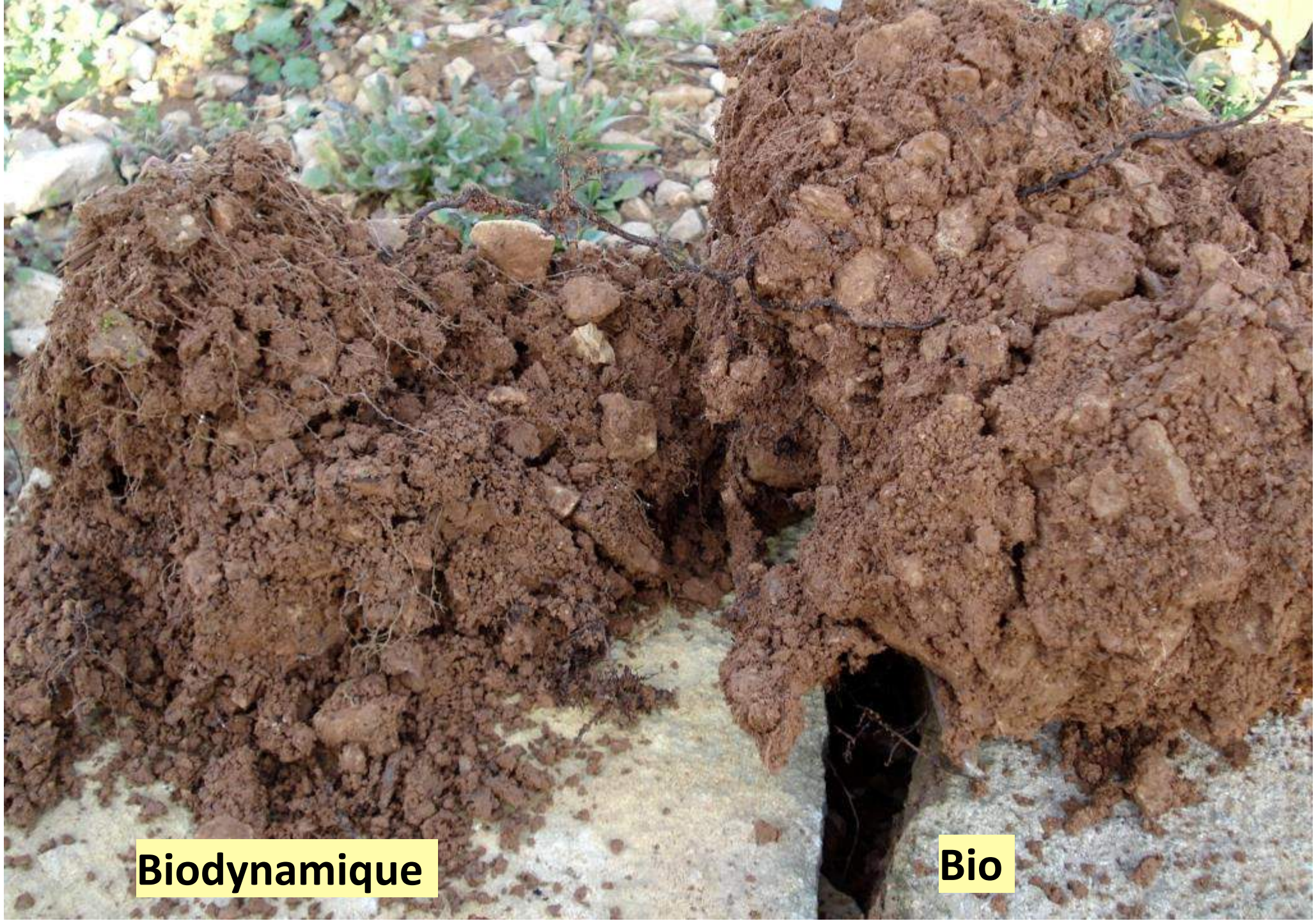
- Effect? **-> yes**
- What effect?

Development goals

=> Increase of resilience / self-organization *-> growth vine*

- vitalization of fertilizer and soil *-> earthworms*
- plant health *-> sour red infestation*
- food quality -> taste wine


Bio
Biodynamique


Biodynamique
Bio

1x 500P le 4 mai lune scorpion (feuille) 1x 501 le 7 mai lune sagittaire (fruit) 1x 500P le 15 mai lune belier en périgée (fruit)


Juni 2016
Bio.-Dyn.
Bio


Juni 2016
Bio
Bio.-Dyn.

Results:

Spade diagnoses -> BioDyn better:

- Structure Surface
- root penetration
- darker colour
- Drop test Underbody less solidified
- better structured microstructures

Soil biology -> at BioDyn:

- pH values higher
- C (microbial) to N (microbial) ratio lower
- C (microbial) to C (total organic) ratio lower

Multi-SIR method -> more effective soil biological processes