

Biodynamic soil health
&
its potential role
in future agricultural practices

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ECOLOGY IN A CHANGING CLIMATE

Approaching biological systems holistically



ECOLOGY IN A CHANGING CLIMATE

Approaching biological systems holistically

Sustainable use of *land ecosystems*



BIODYNAMIC AGRICULTURE: an alternative approach

What is biodynamic agriculture?

BIODYNAMIC AGRICULTURE: an alternative approach

What is biodynamic agriculture?

➔ **ORGANIC** approach
interrelationship of the soil, plants, animals
as a self-nourishing system

BIODYNAMIC AGRICULTURE: an alternative approach

What is biodynamic agriculture?

⇒ ORGANIC approach
a self-nourishing system

⇒ NO artificial chemicals

BIODYNAMIC AGRICULTURE: an alternative approach

What is biodynamic agriculture?

⇒ ORGANIC approach
a self-nourishing system

⇒ NO artificial chemicals

⇒ MANURE with HERBS & MINERALS

BIODYNAMIC AGRICULTURE: an alternative approach

What is biodynamic agriculture?

⇒ ORGANIC approach
a self-nourishing system

⇒ NO artificial chemicals

⇒ USE of manure, herb & mineral preparations

⇒ USE of the ASTRONOMICAL calendar

BIODYNAMIC AGRICULTURE: an alternative approach

Does a biodynamic approach really work?

➔ ASSUMED to reverse degradation and
promote quality of the soil

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AIM

Test if biodynamic methods improve soil quality

BIODYNAMIC AGRICULTURE: an alternative approach

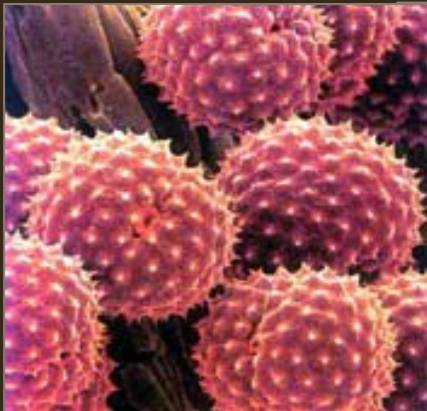
How do you measure soil health?

BIODYNAMIC AGRICULTURE: an alternative approach

How do you measure soil health?

➔ BIOLOGY BALANCE

made up of a wide range of organisms

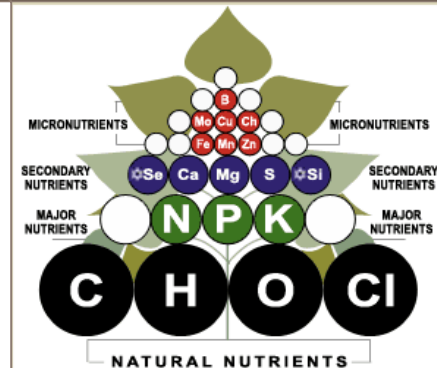
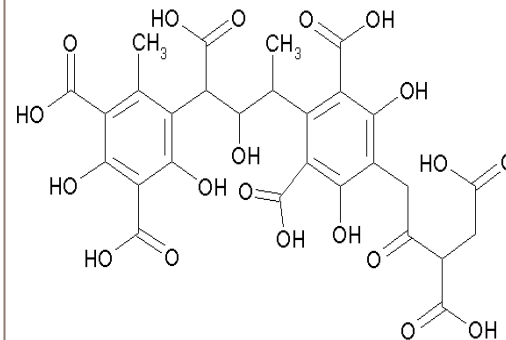
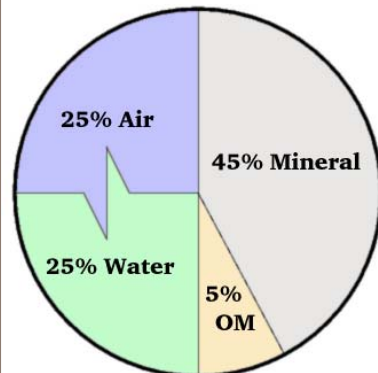


BIODYNAMIC AGRICULTURE: an alternative approach

How do you measure soil health?

⇒ BIOLOGY BALANCE

➔ SOIL BALANCE
chemical and nutritional components



BIODYNAMIC AGRICULTURE: an alternative approach

How do you measure soil health?

⇒ BIOLOGY BALANCE

⇒ SOIL BALANCE

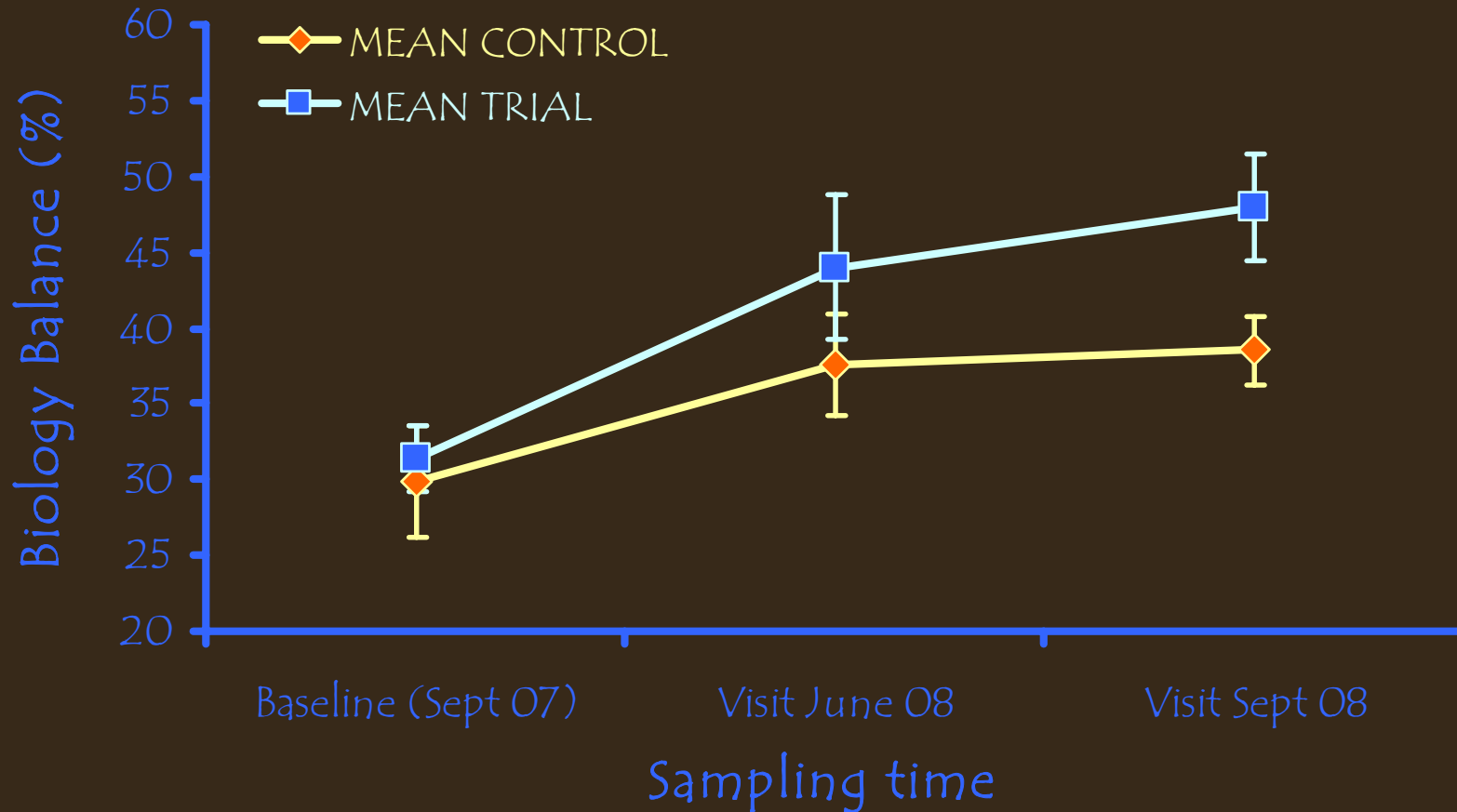


RESULTS

What did I find?

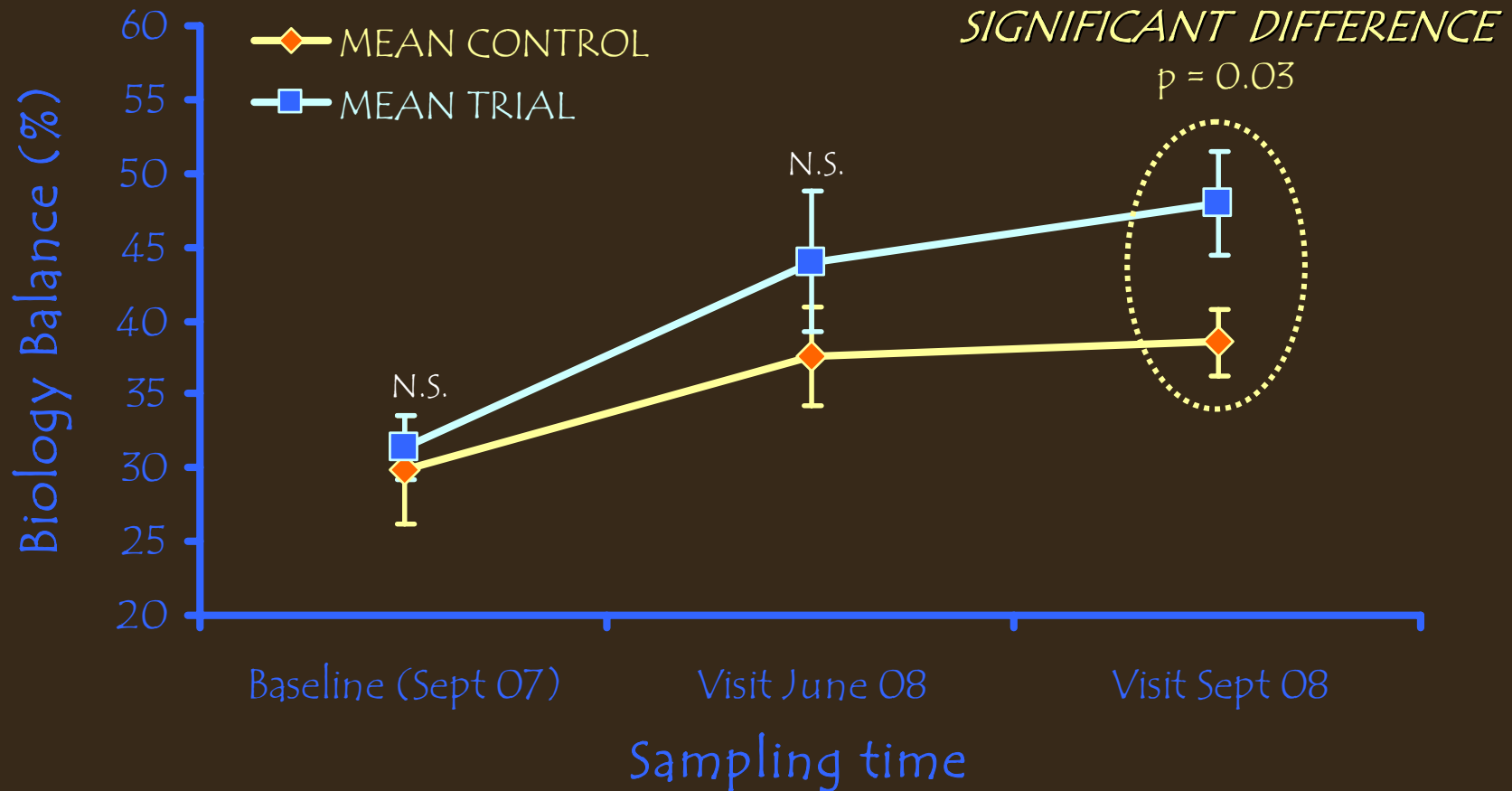
BIOLOGY BALANCE

Does a biodynamic approach improve the biology balance of the land?



BIOLOGY BALANCE

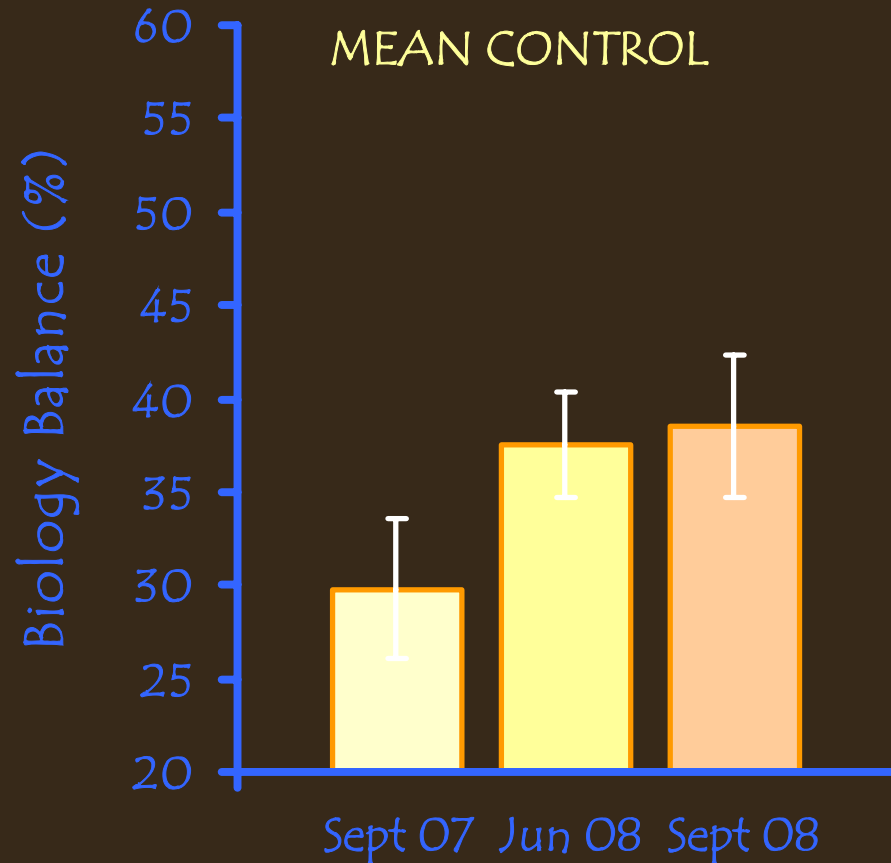
Does a biodynamic approach improve the biology balance of the land?



Mann-Whitney U test, $\alpha = 0.05$ for comparison at a given time; bars indicate SE

BIOLOGY BALANCE

Does a biodynamic approach improve the biology balance of the land?



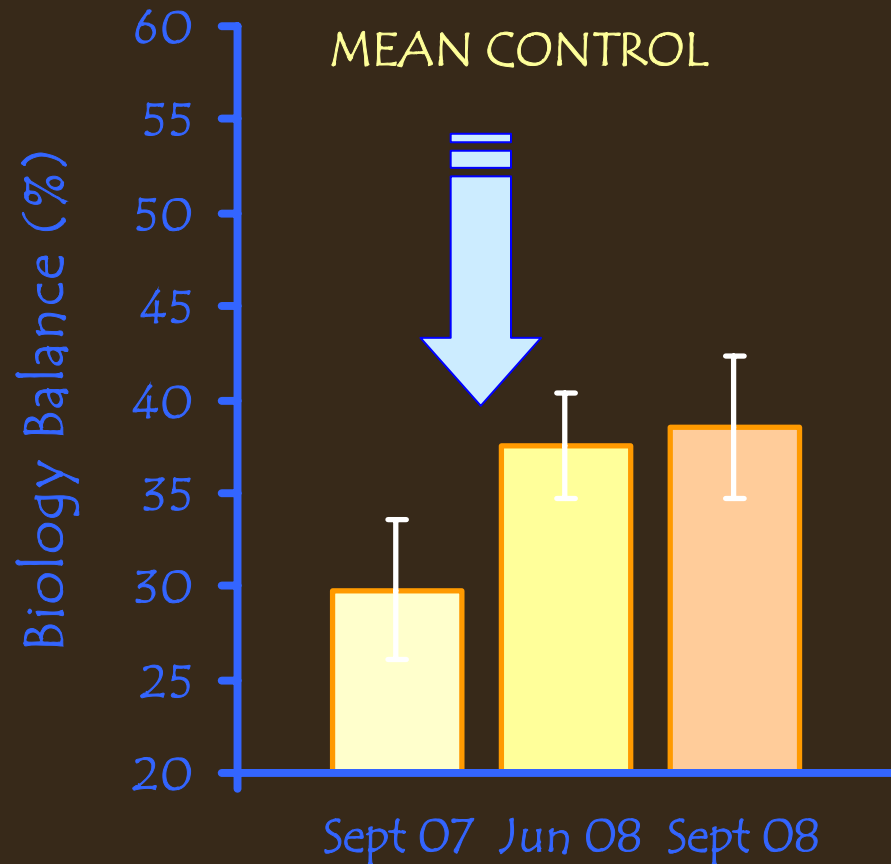
NO SIGNIFICANT CHANGE
in biology balance over time

$$\chi^2 = 2.21, p = 0.33$$

Non-parametric repeated measures ANOVA; bars indicate SE

BIOLOGY BALANCE

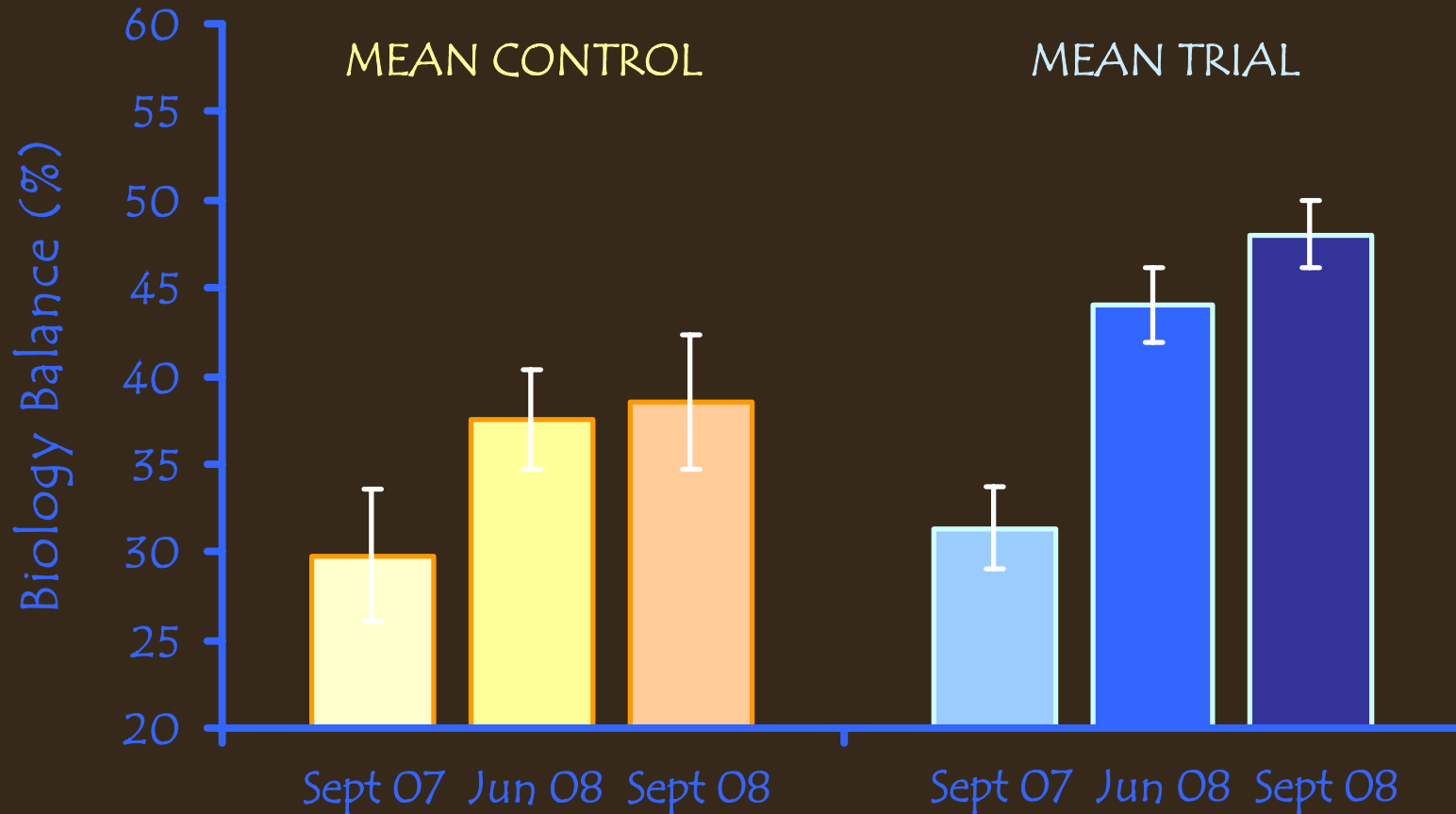
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SEPT-JUNE SHIFT
natural seasonal variation

BIOLOGY BALANCE

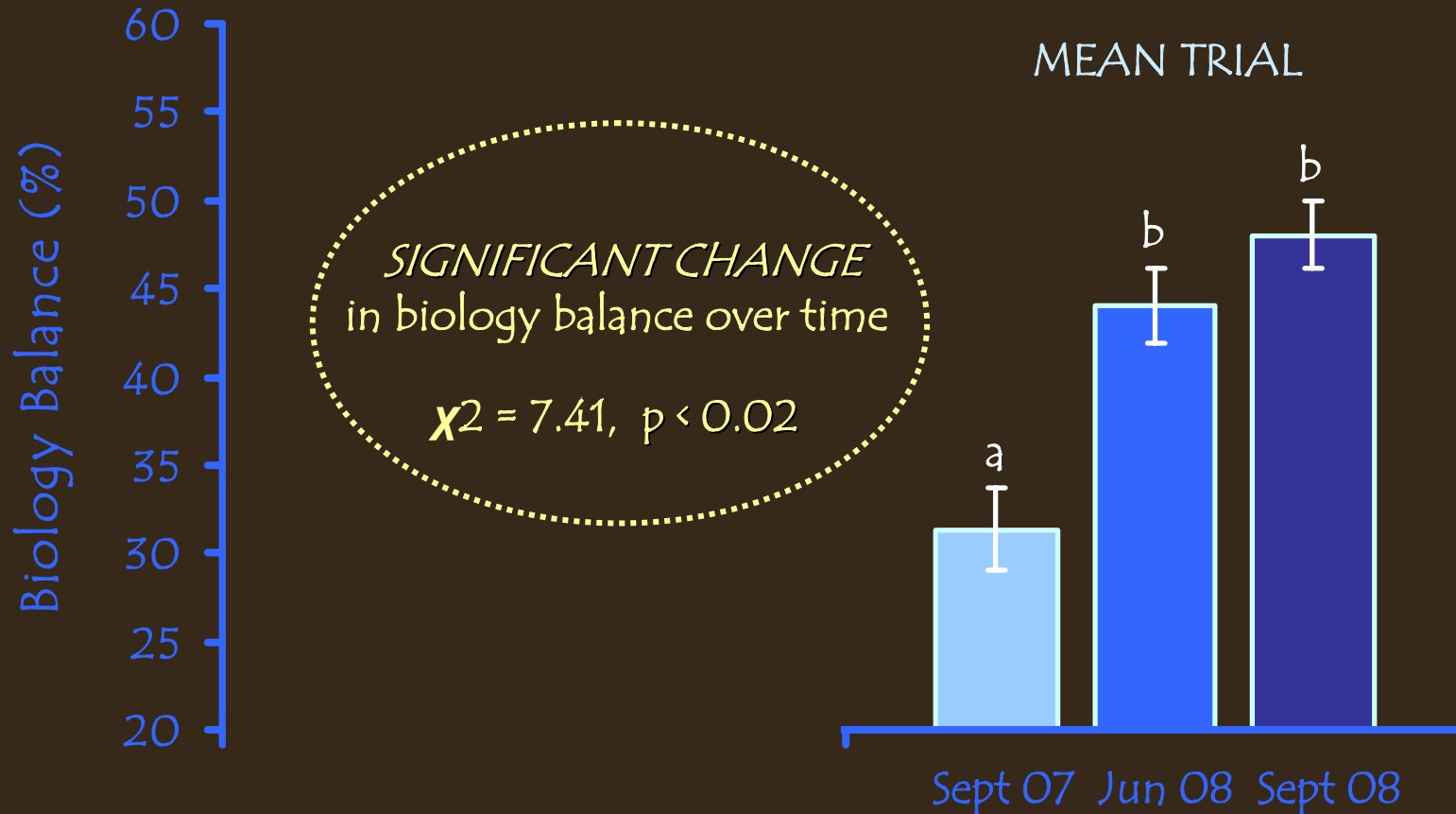
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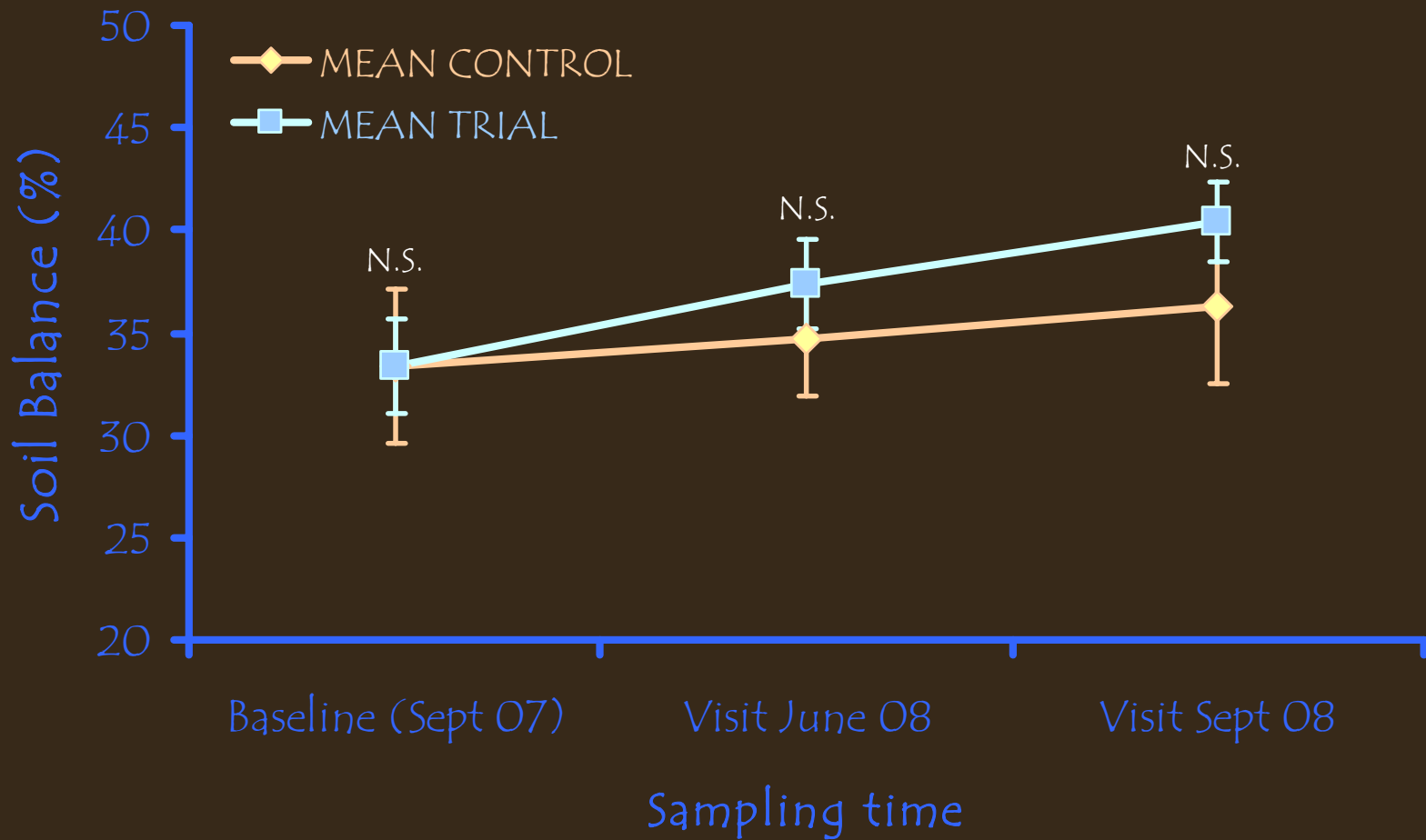
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SOIL BALANCE

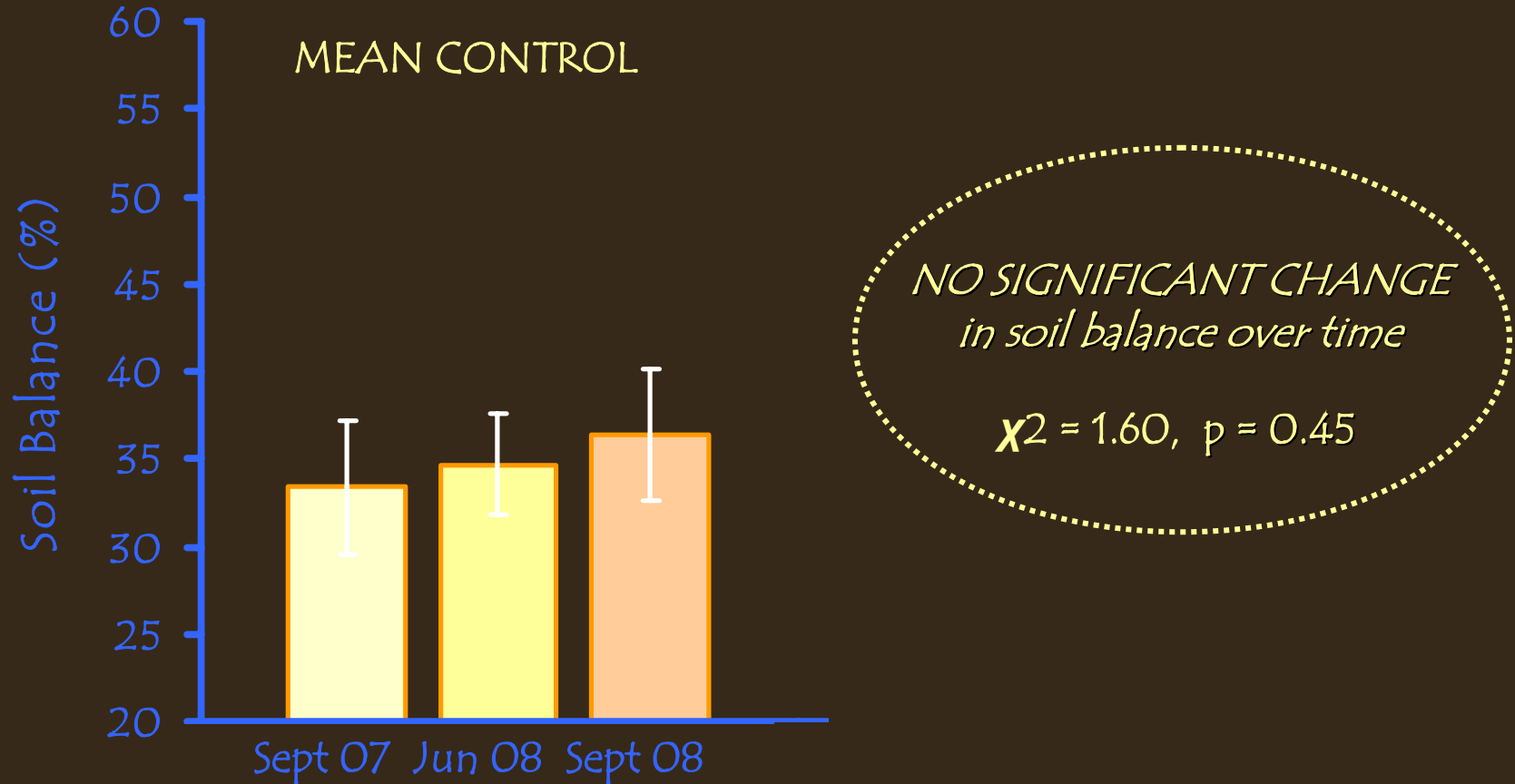
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SOIL BALANCE

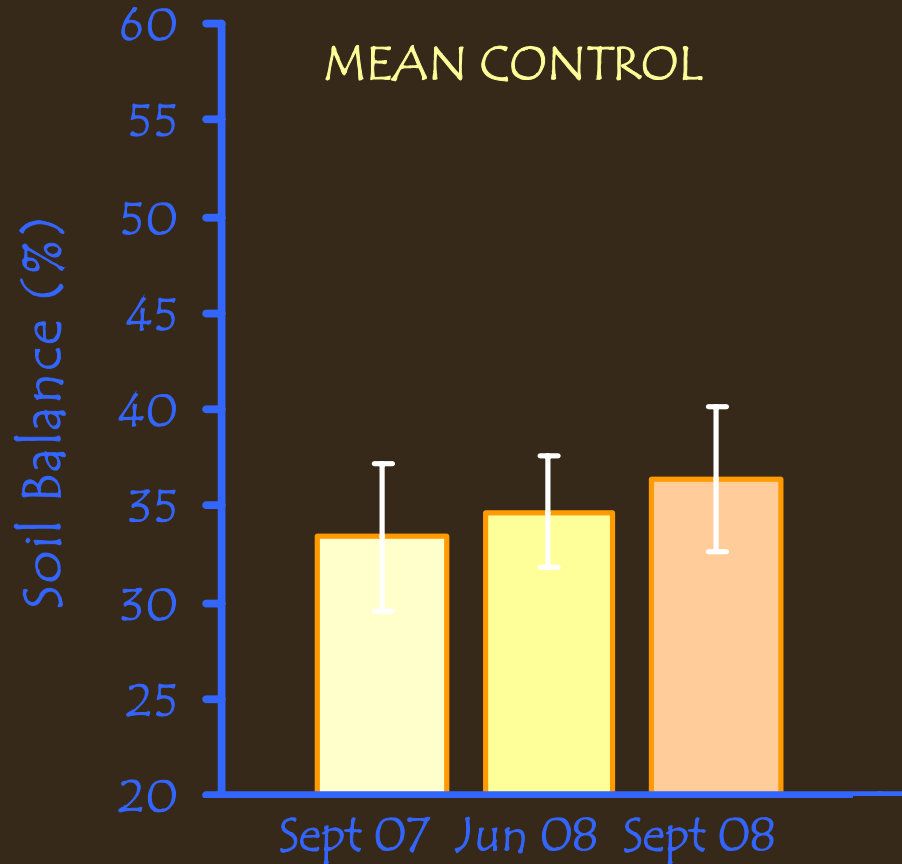
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SOIL BALANCE

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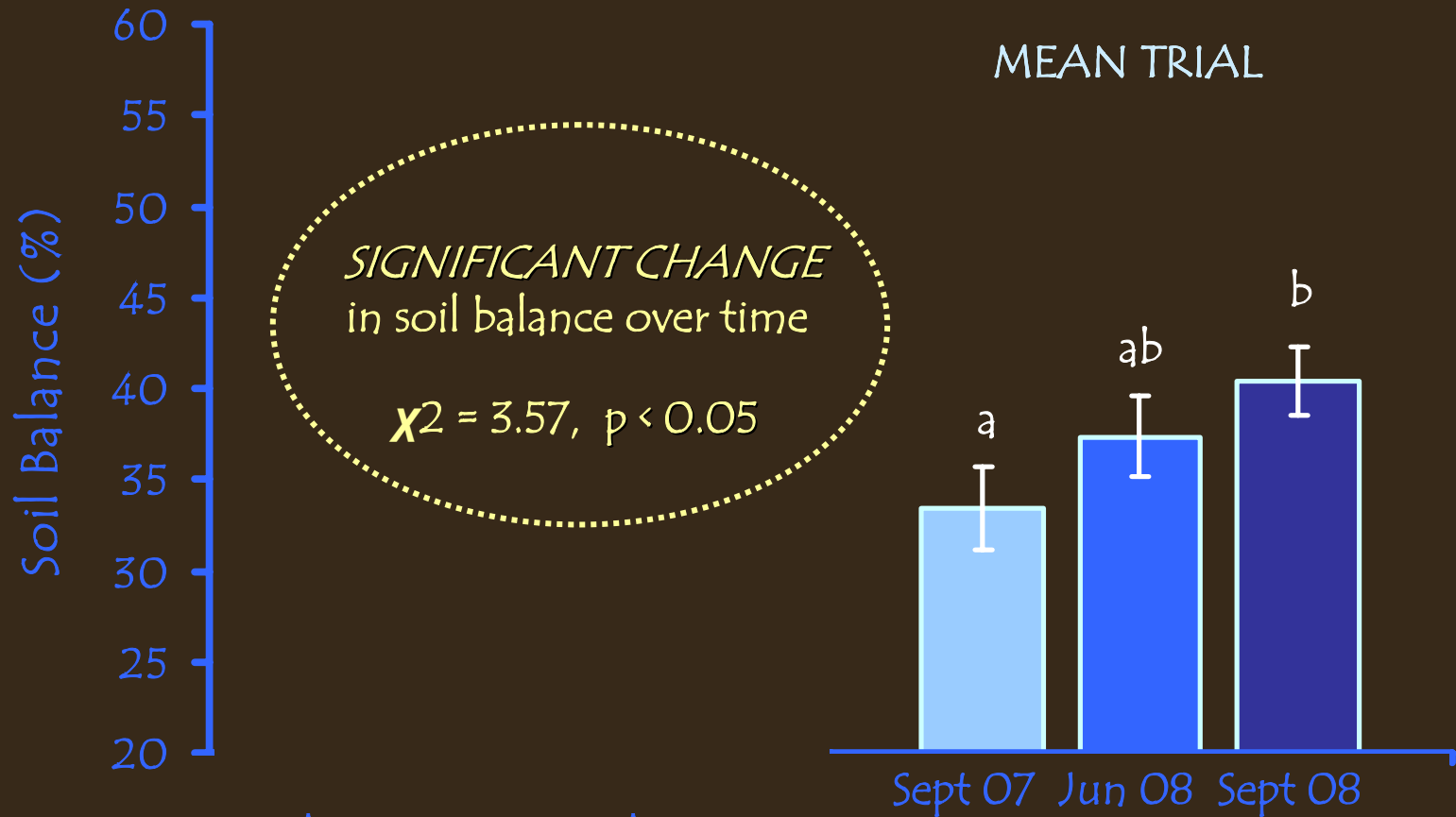


*NO SEPT-JUNE SHIFT
soil chemistry may be
more CONSERVATIVE*

Non-parametric repeated measures ANOVA; bars indicate SE

SOIL BALANCE

Does a biodynamic approach improve the soil balance of the land?



Non-parametric repeated measures ANOVA; bars indicate SE

CONCLUDING REMARKS

What does this all mean?

CONCLUDING REMARKS

➔ Biodynamic methods **PROMOTE**
the **QUALITY** of the soil



CONCLUDING REMARKS

- ⇒ Biodynamic methods PROMOTE the QUALITY of the soil
- ➔ Effective, Efficient and Economic

Acknowledgements

All 8 farmers

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for funding this project*

