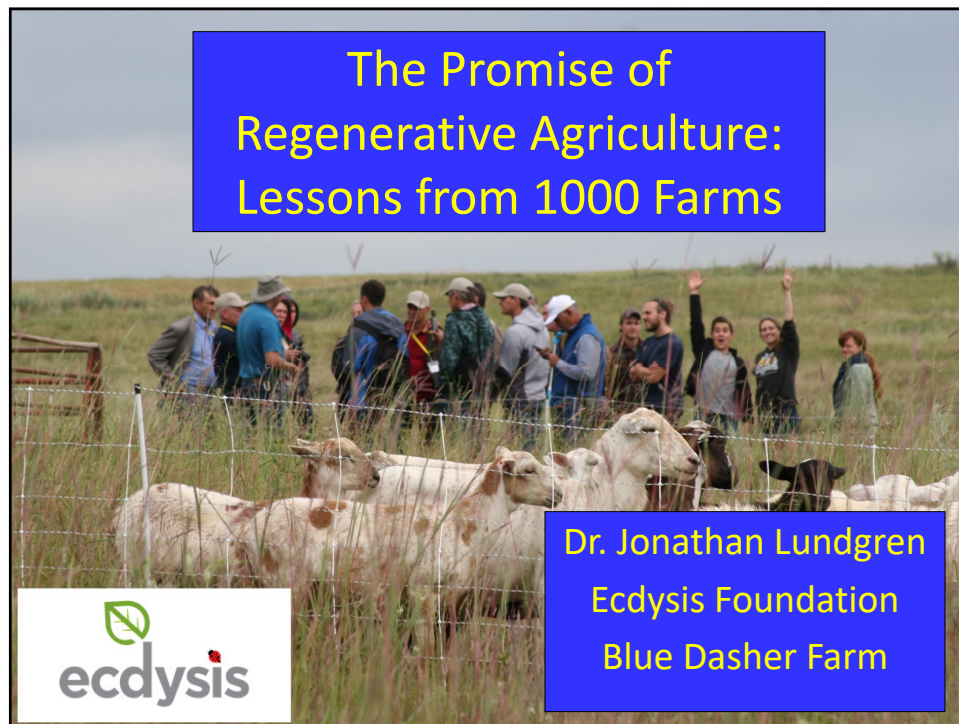




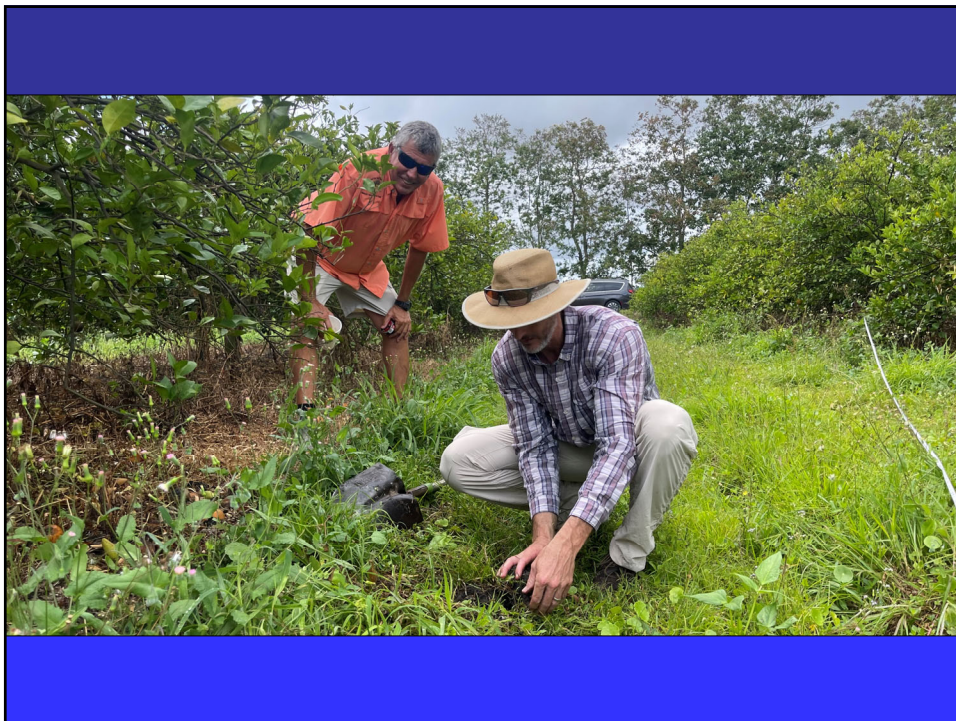
1



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5



6

Neonicotinoids Affect Organisms in Ways We Don't Understand



70% of deer in MT
had genital
deformities and jaw
deformities

Elise Hughes Berheim et al. 2019. Sci Reports 9: 4534

7

Does Imidacloprid Harm Deer?

A 2-year captive
deer study

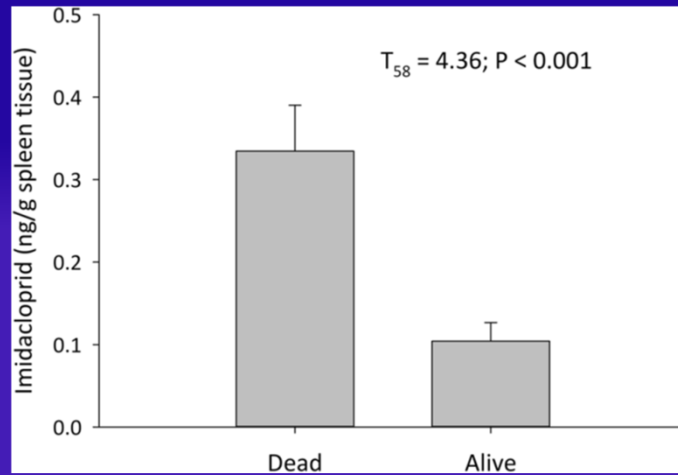
3 doses
administered
weekly in their
water



Elise Hughes Berheim et al. 2019. Sci Reports 9: 4534

8

Imidacloprid and fawn mortality



9

More Imidacloprid in Spleens were Associated With Reduced:

fawn body weight

fawn thyroid hormone levels

fawn organ weights

fawn jawbone length

activity levels in adult deer



10

What are Spleen Imidacloprid Levels in Wild Deer?

Captive deer spleens
0.18 ng imidacloprid/g
of spleen

ND wild deer spleens
0.60 ng imidacloprid/g
of spleen



11

41% of land in SD is planted
with neonics

12



How is it working?

13



14

What Makes A Farm Regenerative?

Regenerative agriculture connects humans with nature, family, and community

synthetic chemical use

LaCanne and Lundgren, 2018. PeerJ 6: e4428
Fenster et al. 2021 Front Sust Food Syst: 5: 664359
Fenster et al. 2021 F1000 Research 10: 115

15

We Need Science, But It Has to be Done Right



16

A Different Kind of Science is Needed



- Systems-level
- Farmer-driven
- Across ecoregions
- Reflect food systems

17



The largest agricultural experiment ever conducted

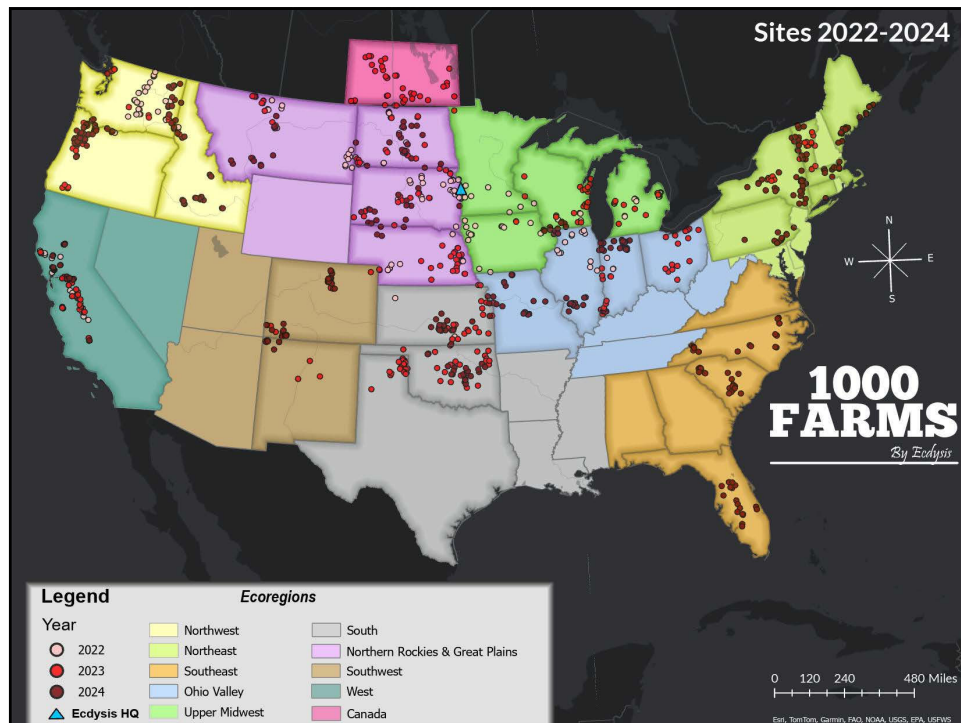
18

Goals

- 1) Validate regenerative systems in key food crops
- 2) Create roadmaps for conventional producers to go regenerative



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Food Systems

35+ Cropping Systems

Corn
Wild blueberries
Wheat
Almonds
Apples
Market vegetable gardens
Hazelnuts
Etc...

5+ Livestock Systems

Cattle
Dairy
Bison
Sheep
Goats
Etc...

21

Each Farm Represents a Set of Management Practices

Conventional

Tillage
 Bare soil
 Monocropped
 Synthetic chemicals



Regenerative

No-till
 Plant diversity
 Organic amendments
 No synthetic chemicals
 Livestock integration
 (managed rotationally)

We assess this using a Regenerative Score (1-8)

Fenster et al 2021. Faculty 1000Research 10: 115

22



23

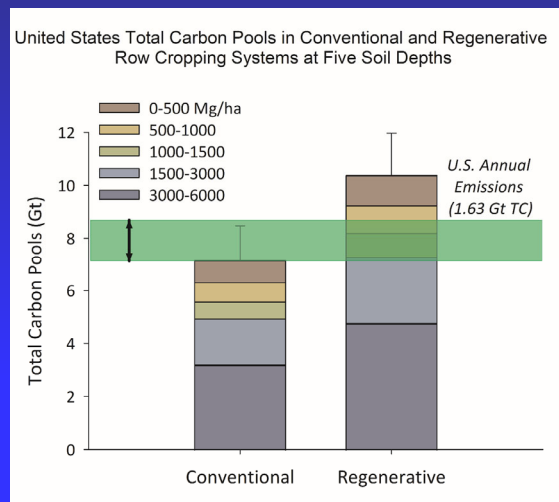


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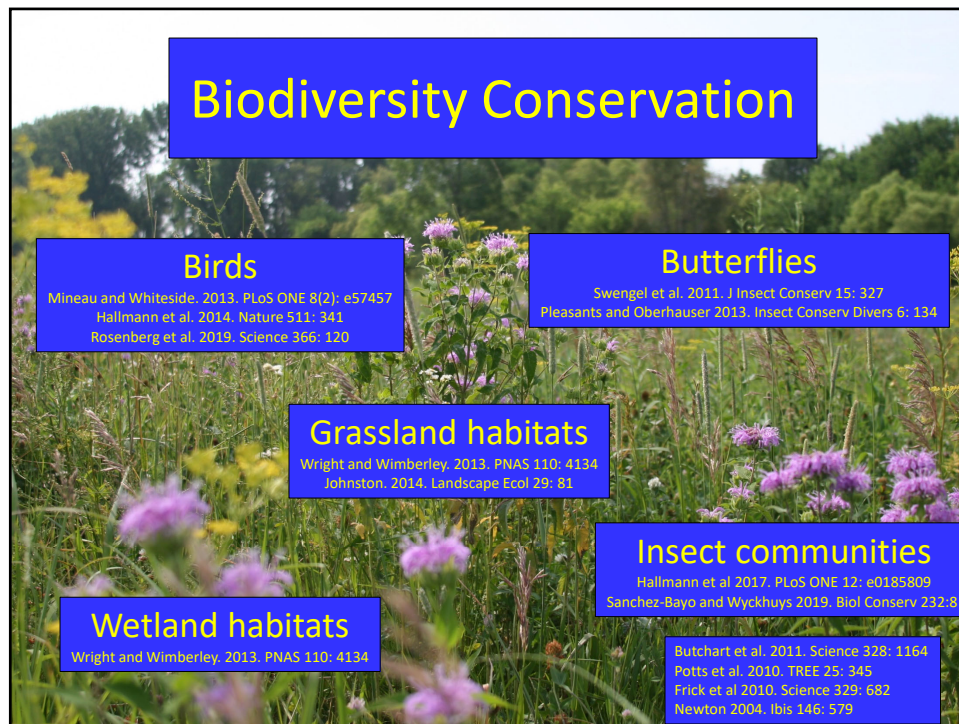
Can Regenerative Agriculture Store Our Annual Carbon Emissions?



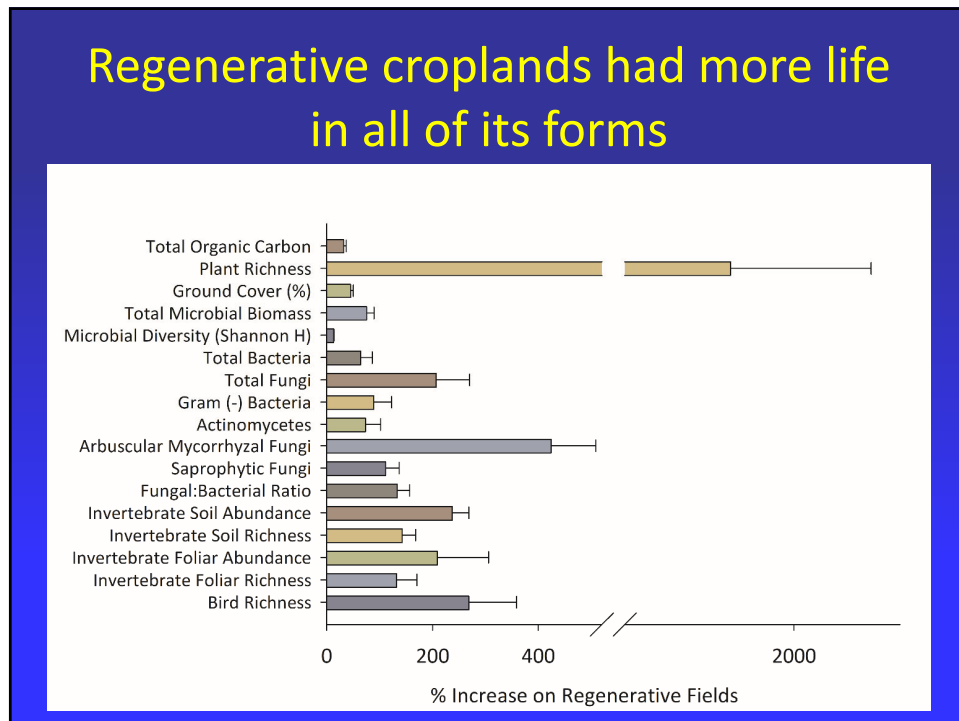
Regenerative
row crops store
11 GT CO₂e

(US emissions are 6 CO₂e
per year)

26

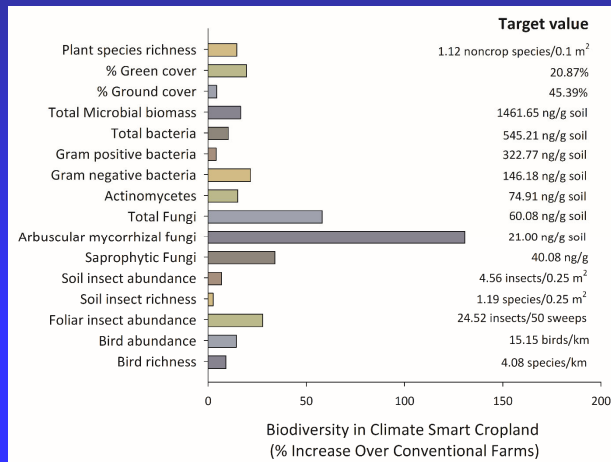


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Biodiversity Was Associated with Carbon Storage



What would a biological community look like in a world in which cropland soils store US ghg emissions?

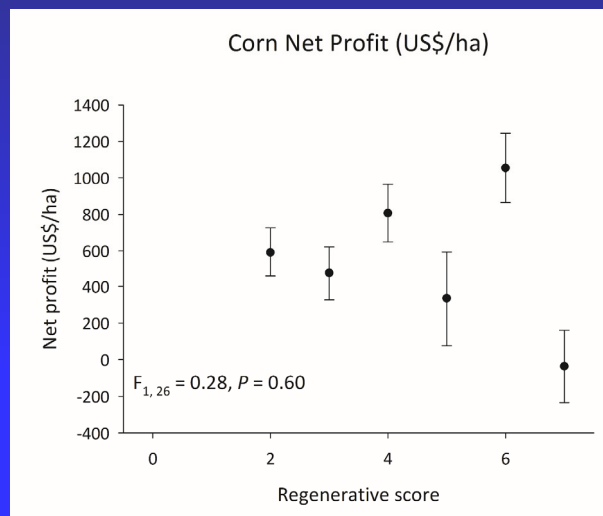
29

Economics and Yields

Regenerative corn, wheat, and soybeans yields = national averages

Conventional yields were higher

Net profits were similar among conventional and regenerative farms



30



31

Farmer Motivations Behind Management Decisions

Conventional farmers

- Finances
- Legacy of past generations
- Expanding the size of your operation
- Yield

Regenerative farmers

- Mental and physical wellness of their family

The majority of conventional and regenerative farmers say that Soil Health matters

32

1000 Farms: Health and Wellness

Based on 141 survey responses
PRELIMINARY! (data is rolling in now)

	Croppers		National Avg
Allergies	41%	26%	↑58%
Asthma	16%	8%	↑100%
Anxiety	32%	31%	↑2%
Depression	25%	8%	↑212%
Parkinson's	5%	0.2%	↑2400%
Cancer	17%	5.5%	↑209%

33



34



35



36

Please Sign Up Your Farm!



www.ecdysis.bio
Jonathan.lundgren@ecdysis.bio

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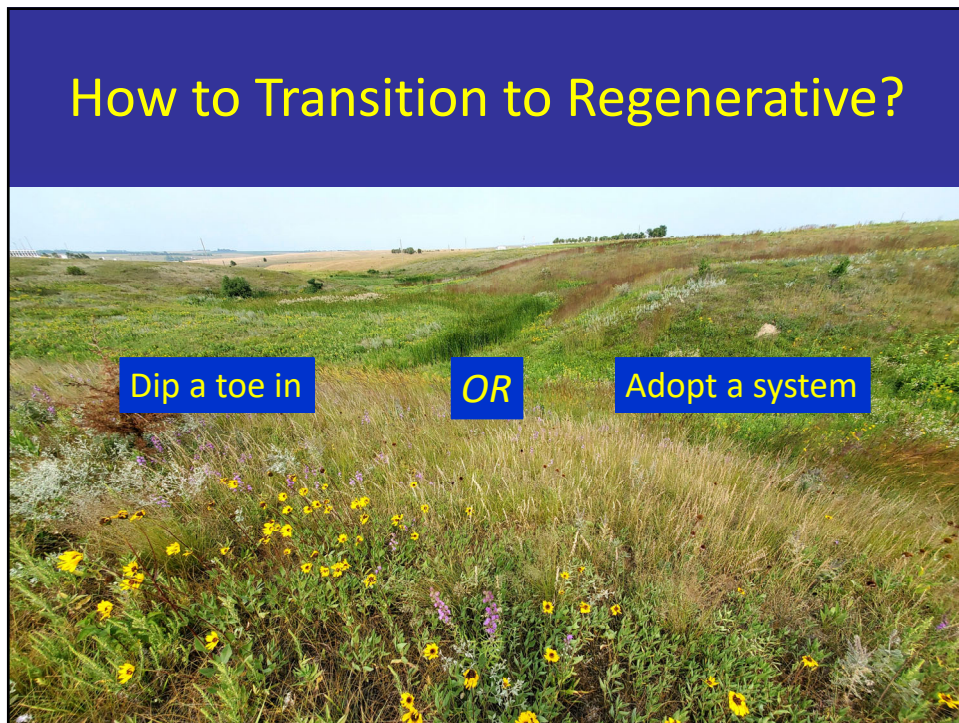


*What will you do with your
extraordinary chance?*

38



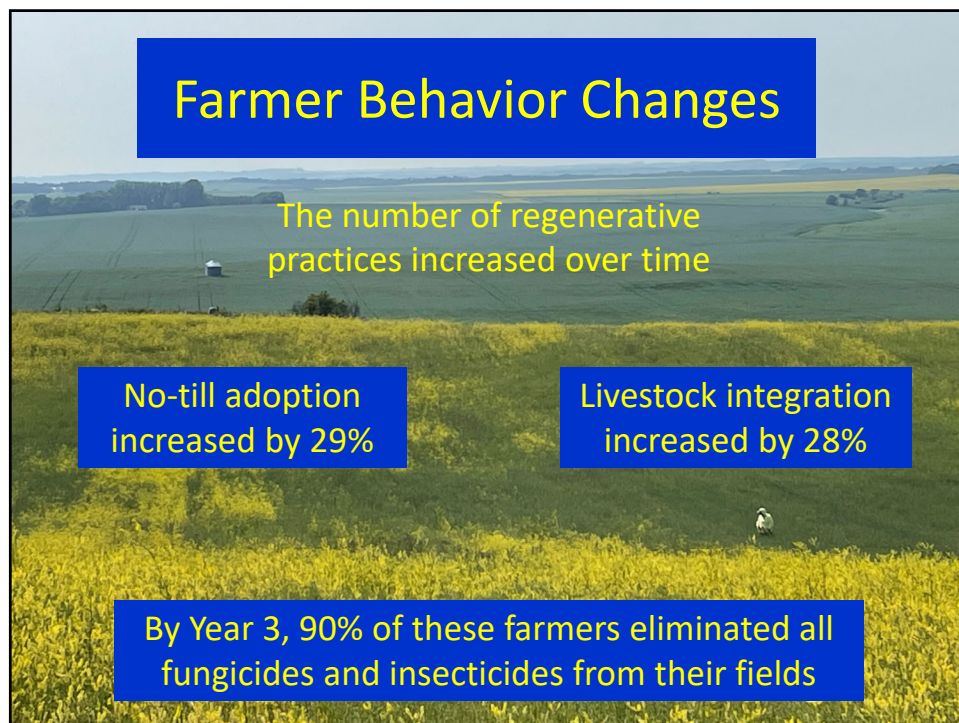
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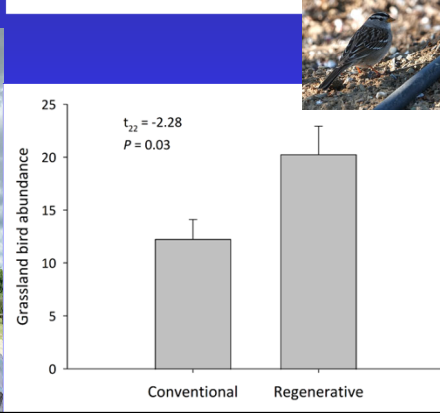
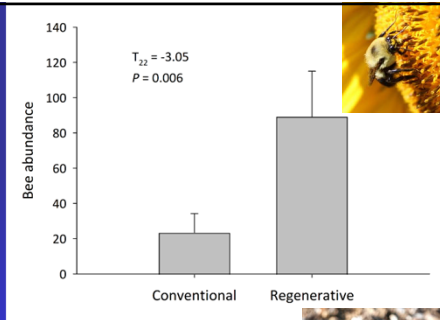


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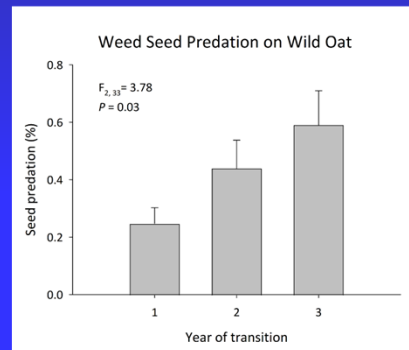
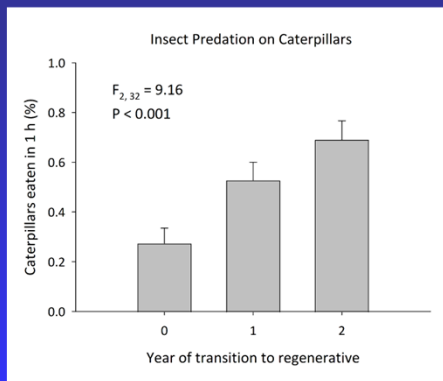
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Life Responded Strongly to this Transition



43

This Life Performed More Services

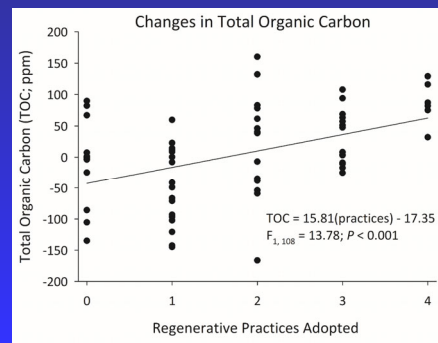
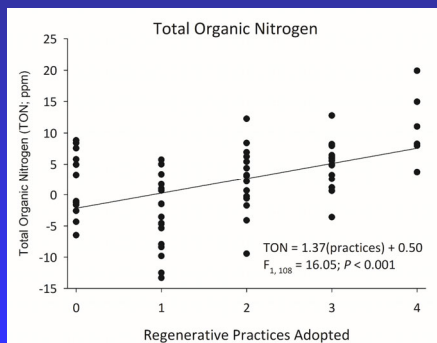


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Adopting More Regenerative Practices Is Better



Phosphorus Haney Soil Health Score

Organic P = $0.23(\text{score}) + 0.60$; $F_{1, 108} = 5.06$, $P = 0.03$
 Soil Health = $0.58(\text{score}) + 1.73$; $F_{1, 108} = 4.85$, $P = 0.03$

46

Conventional almond orchard



Regenerative almond orchard



**Transition is
Possible!**

Changes happen fast,
and continue for a long
time