

How do yields from organic systems actually compare to conventional practices?

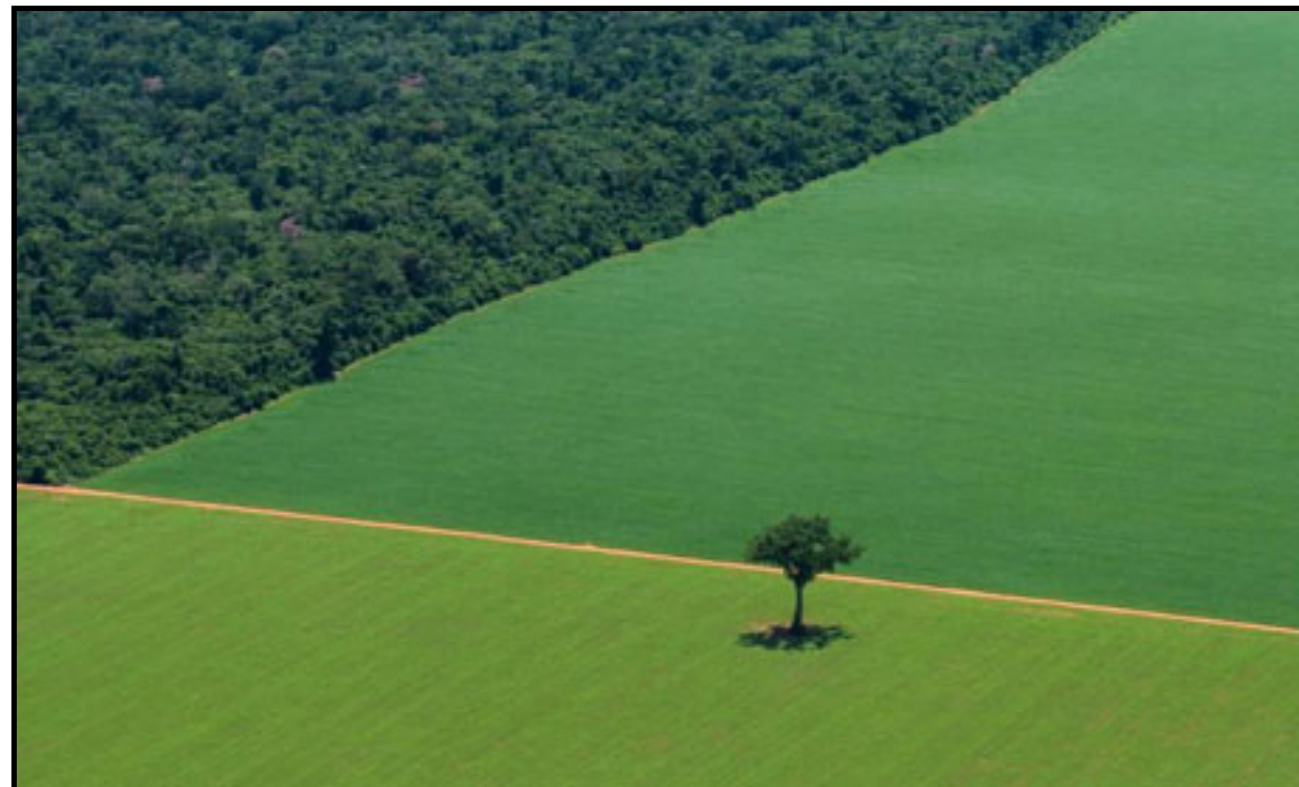
Lauren Ponisio



Water & soil



Climate Change



Biodiversity loss



Not nourishing people





30-40% of production is wasted

Industrial agriculture cannot
“feed the world”







Plot

Field

Landscape



Plot

Field

Landscape



Plot

Field

Landscape



Polyculture/
inter-cropping

Plot

Field

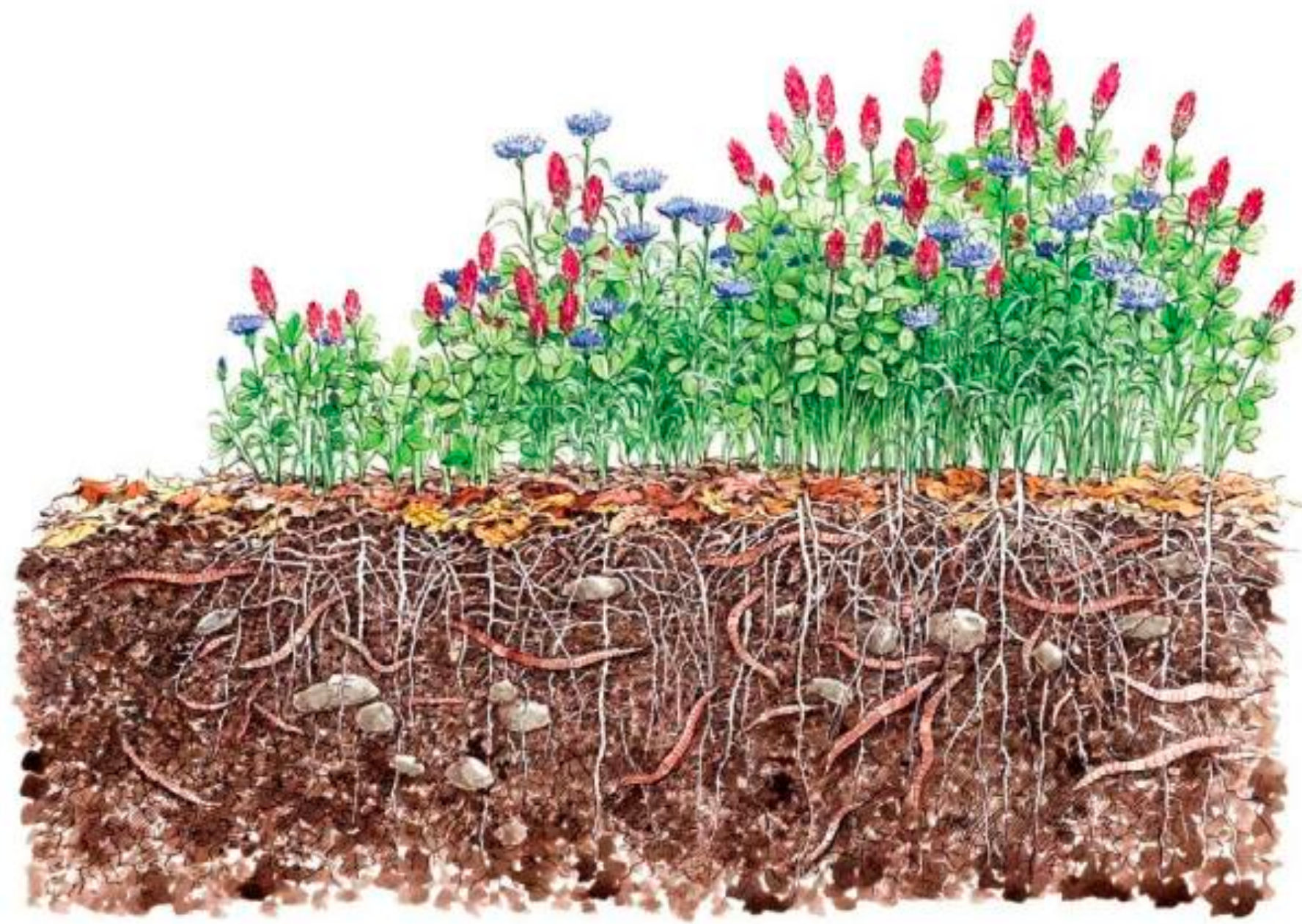
Landscape



Polyculture/
inter-cropping

Spatial Diversification

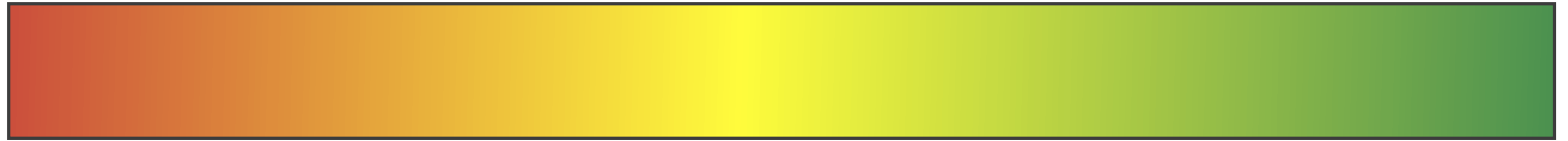




Plot

Field

Landscape



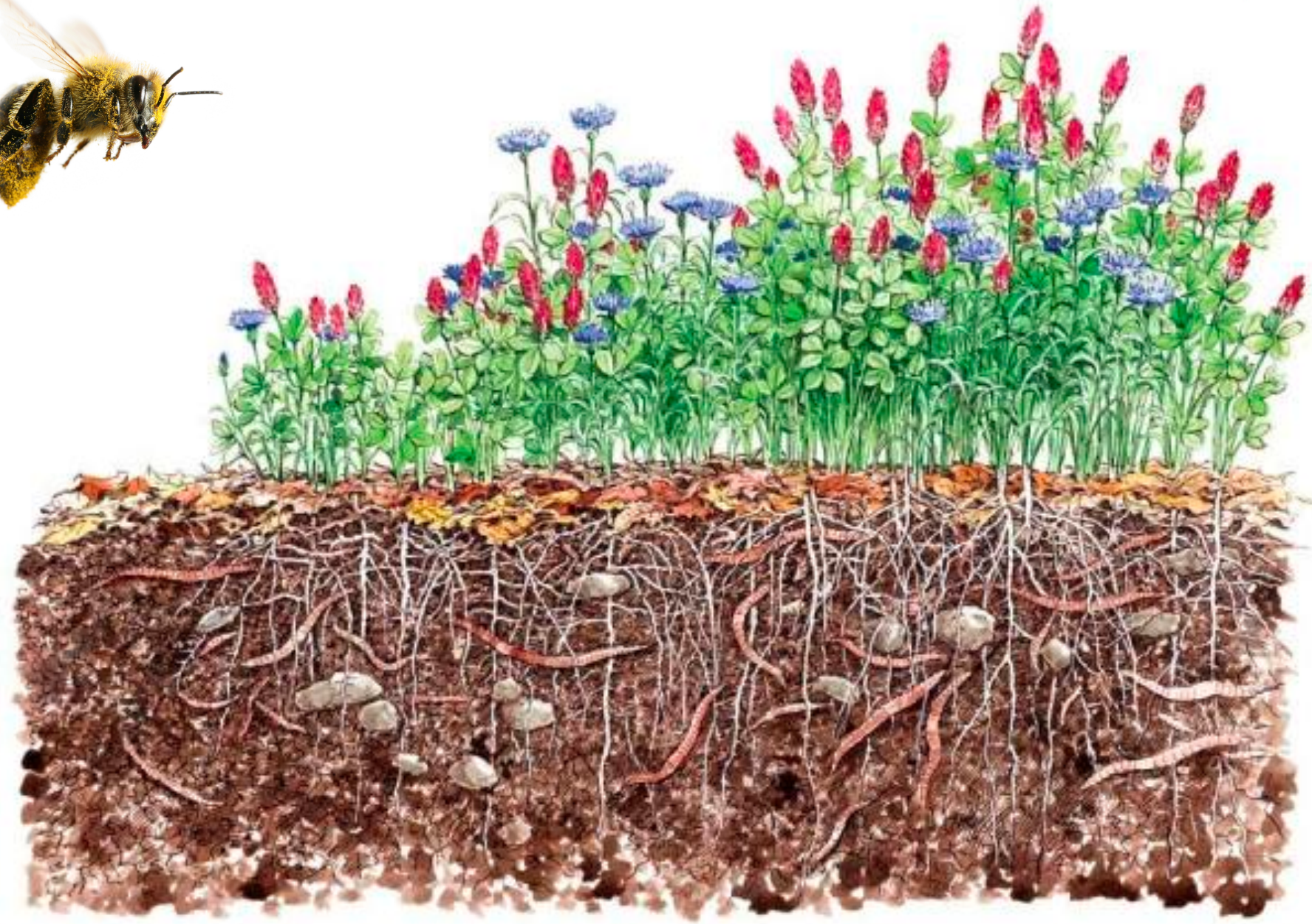
Polyculture/
inter-cropping

Nutrients

Water

Soil

Agro-biodiversity



Plot

Field

Landscape



Polyculture/
inter-cropping

Nutrients

Water

Soil

Pest
control

Pollination

Agro-biodiversity



Plot

Field

Landscape



Polyculture/
inter-cropping

Nutrients

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Soil

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control

Pollination

Agro-biodiversity

Plot

Field

Landscape



Polyculture/
inter-cropping

Crop rotation/
cover crop

Nutrients

Water

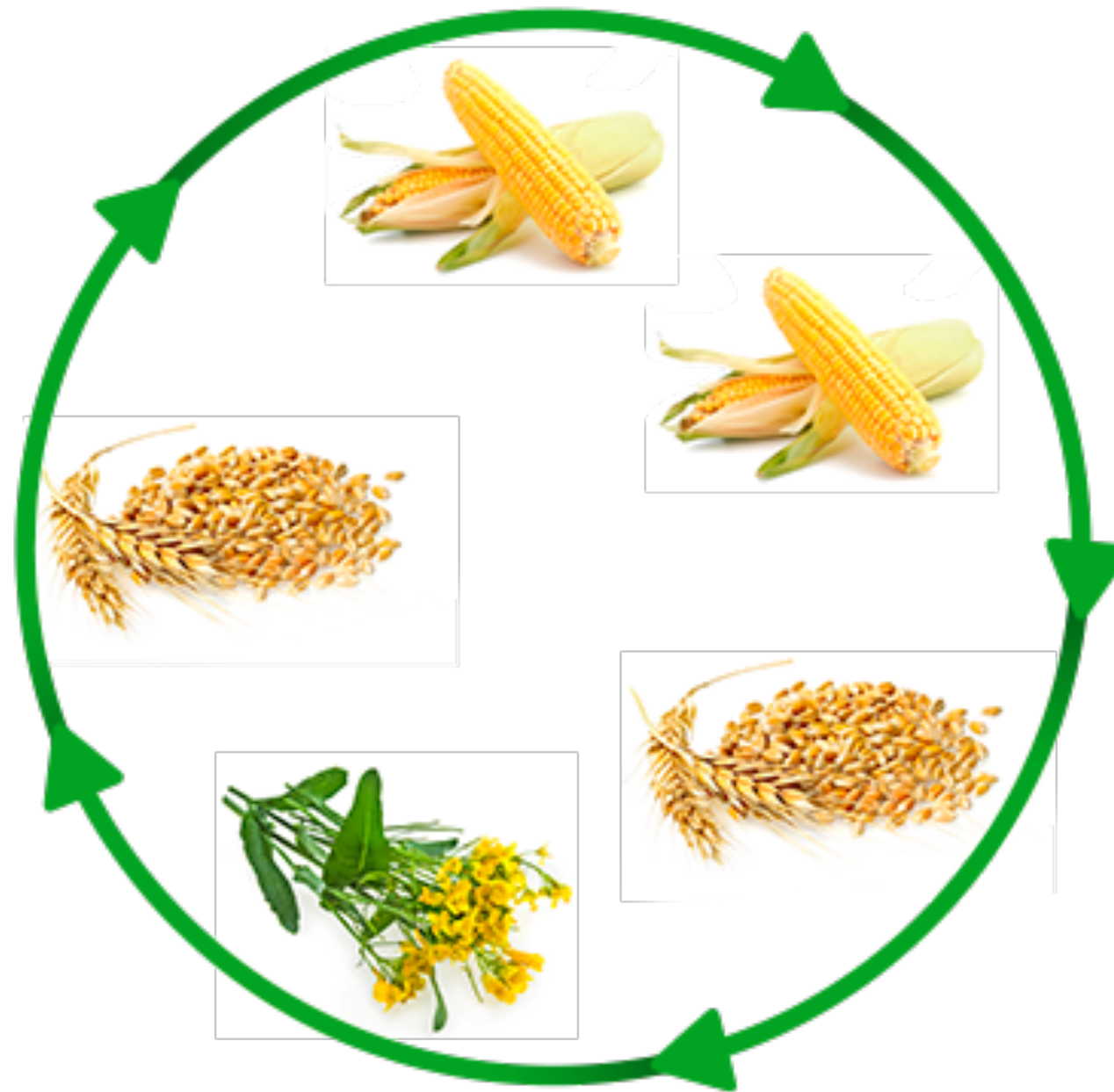
Soil

Pest
control

Pollination

Agro-biodiversity

Temporal Diversification



Plot

Field

Landscape



Polyculture/
inter-cropping

Crop rotation/
cover crop

Nutrients

Water

Soil

Pest
control

Pollination

Agro-biodiversity

Plot

Field

Landscape



Polyculture/
inter-cropping

Crop rotation/
cover crop

Hedgerow/
buffer strips

Riparian
corridors/
meadows

Natural areas

Nutrients

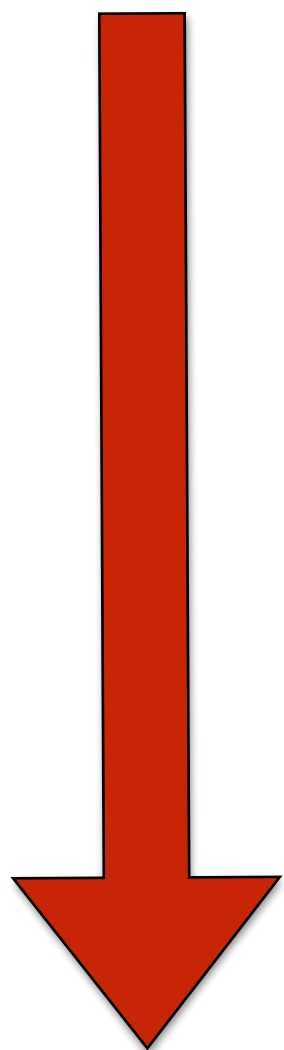
Water

Soil

Pest
control

Pollination

Agro-biodiversity





1 billion
hungry

1 billion
overweight



**1 billion
hungry**

**1 billion
overweight**











Rodale Institute



VS.



Spatial Diversification



Temporal Diversification



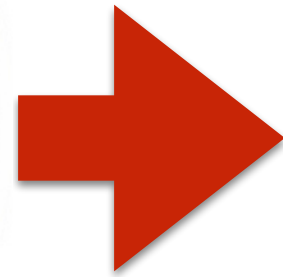
VS.



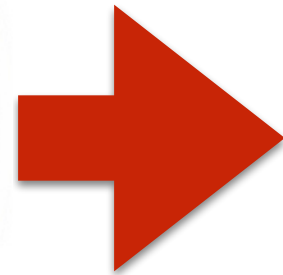
Meta-analysis



Meta-analysis



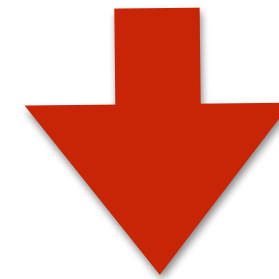
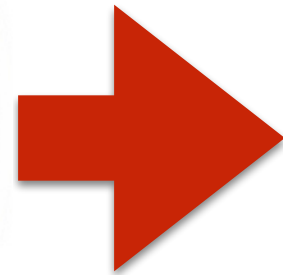
Meta-analysis



115 studies,
1071 yield comparisons

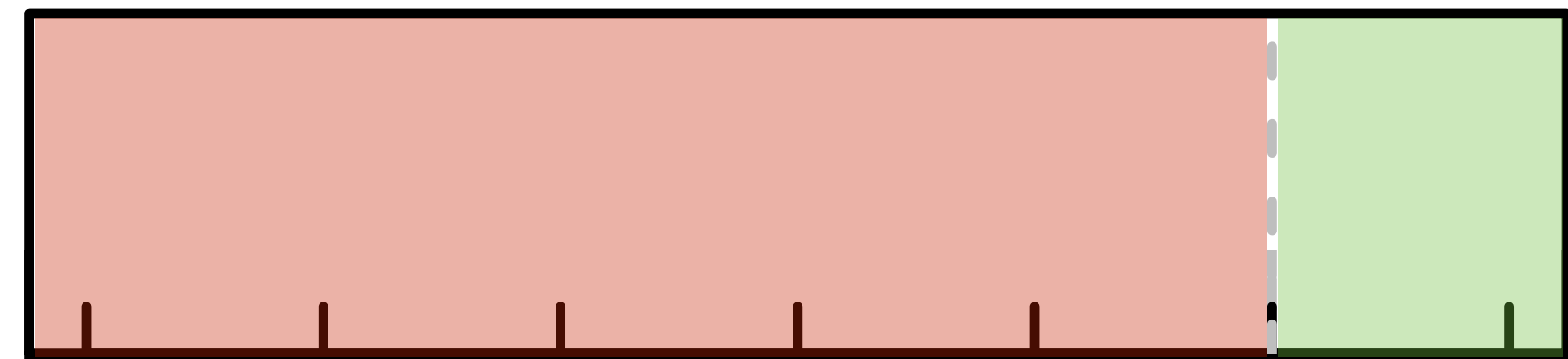
38 countries
52 crop species
35 years

Meta-analysis



Meta-analytic model

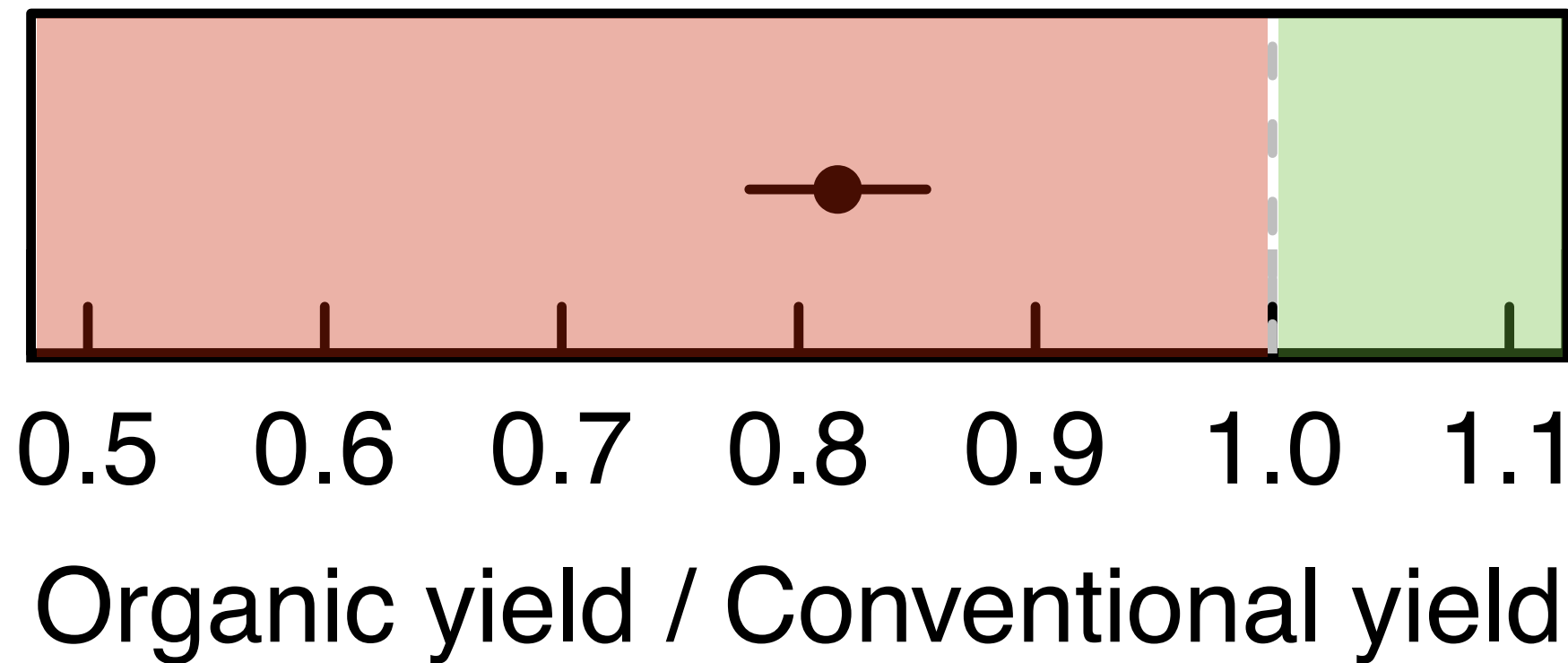
Overall yield ratio estimate



0.5 0.6 0.7 0.8 0.9 1.0 1.1

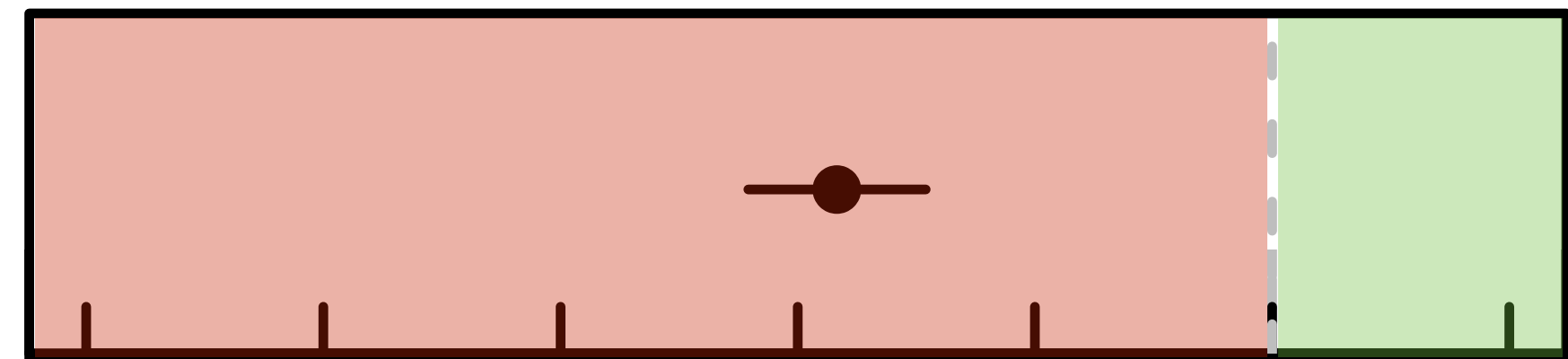
Organic yield / Conventional yield

Overall yield ratio estimate



Overall yield ratio estimate

$\sim 19\% \pm 4\%$



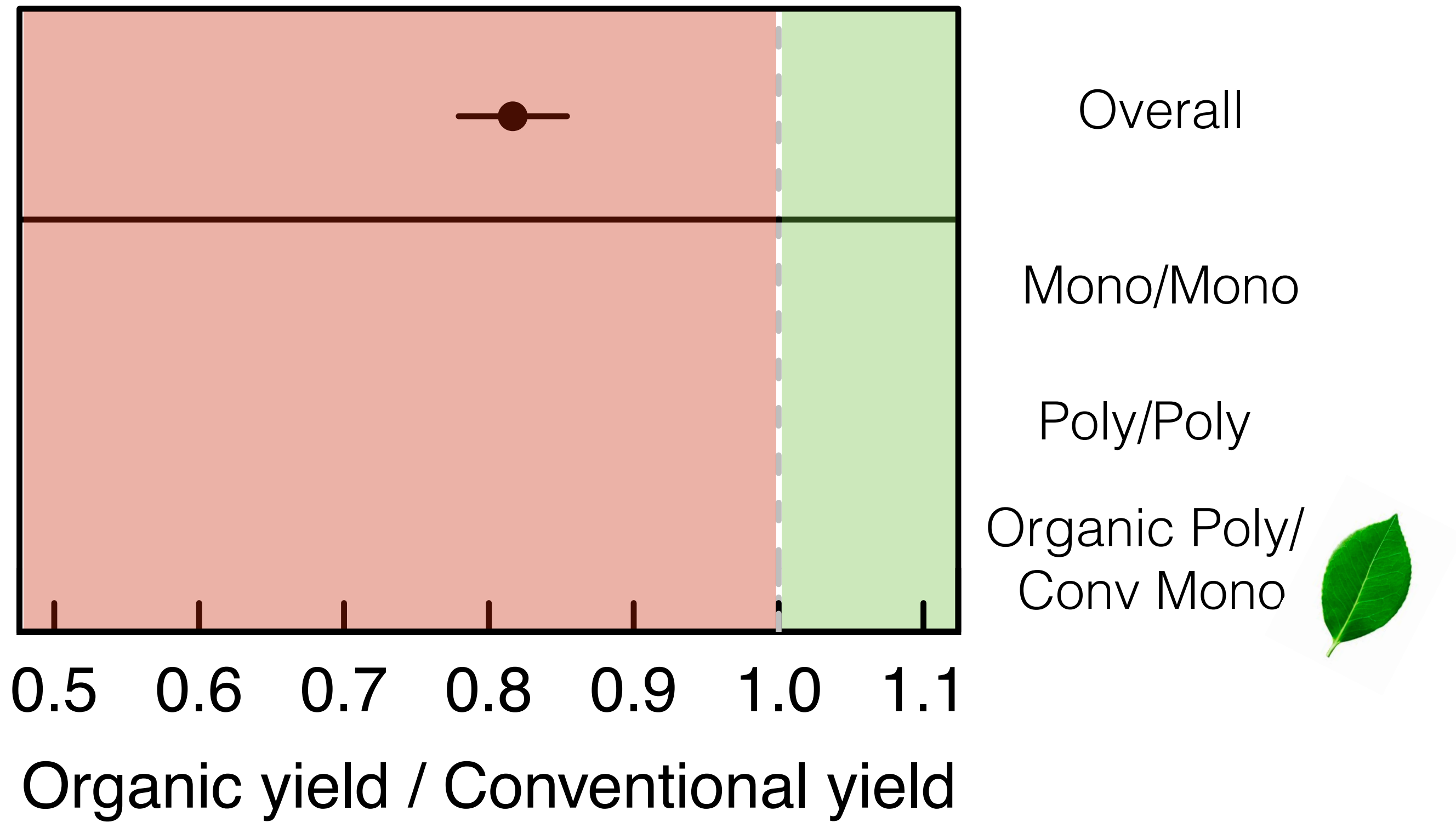
0.5 0.6 0.7 0.8 0.9 1.0 1.1

Organic yield / Conventional yield

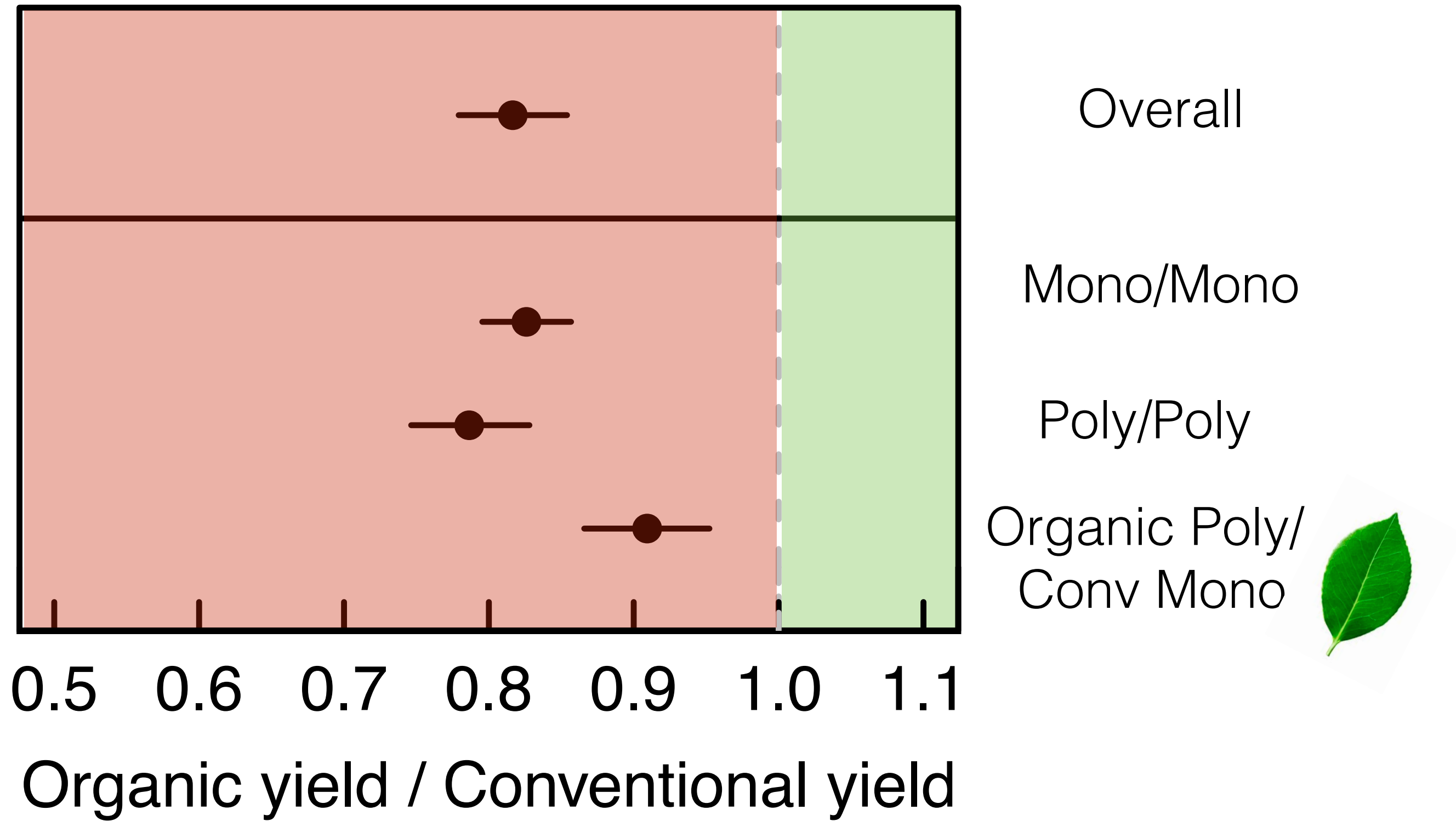
Spatial Diversification



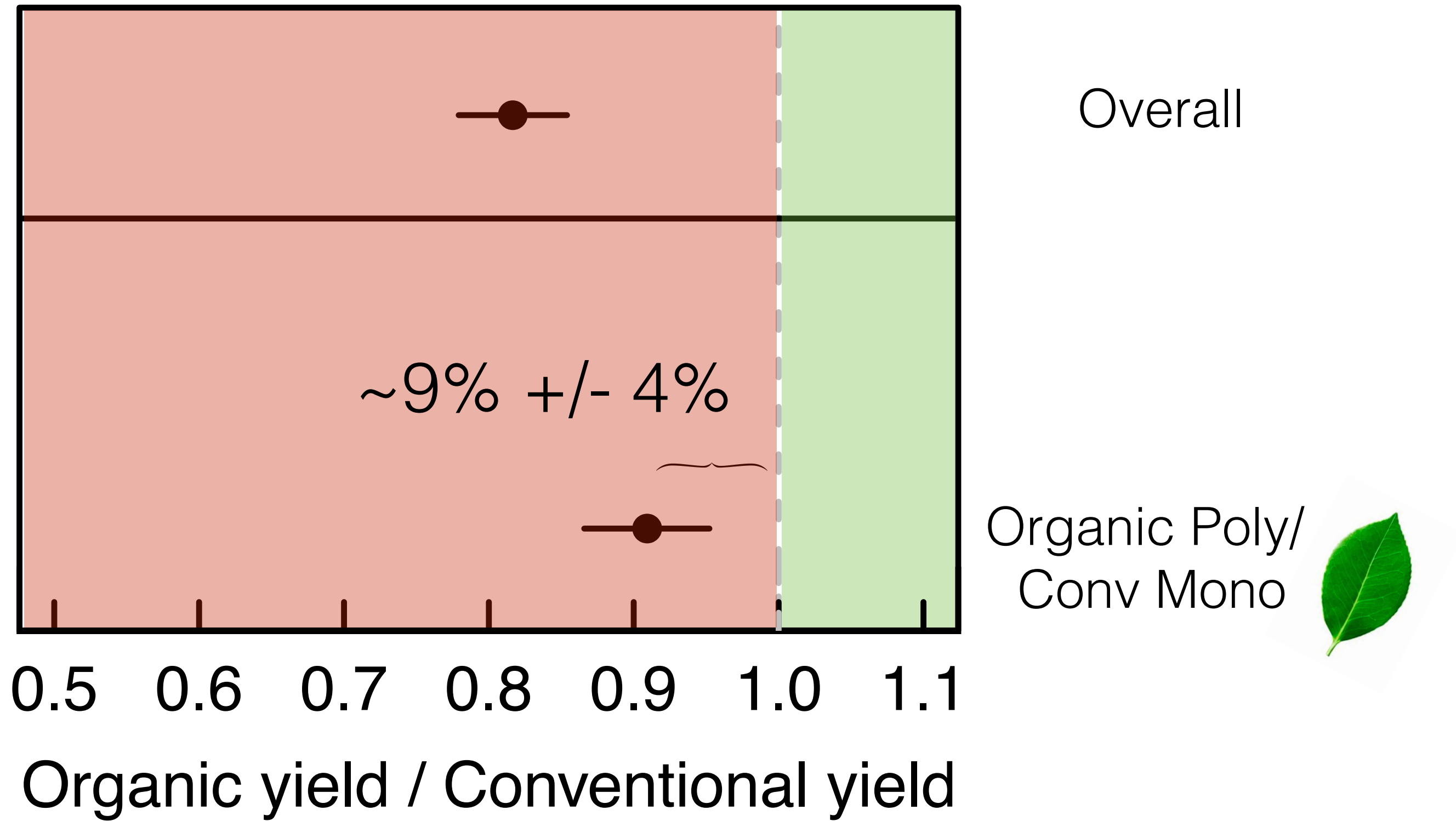
Spatial Diversification



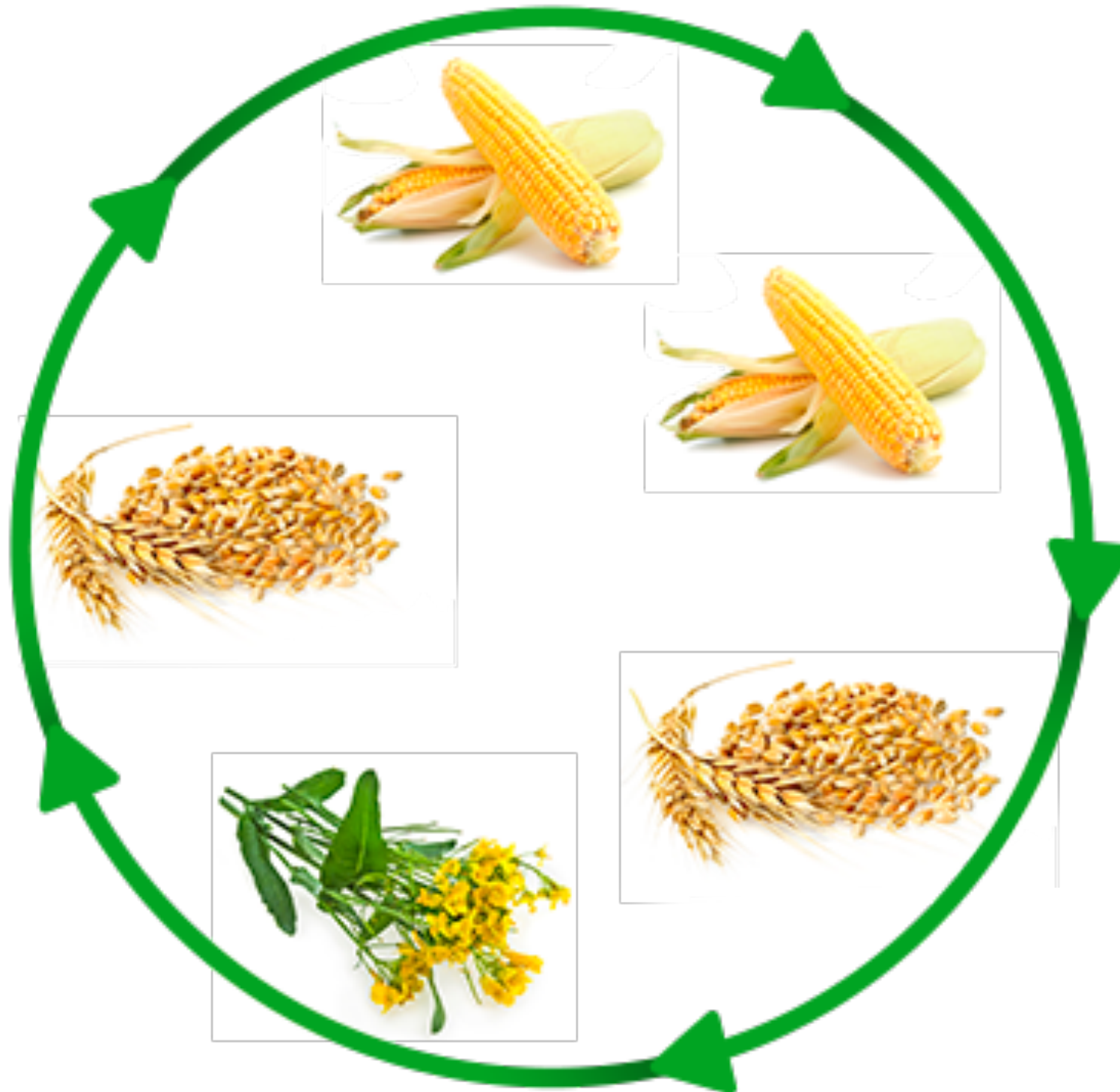
Spatial Diversification



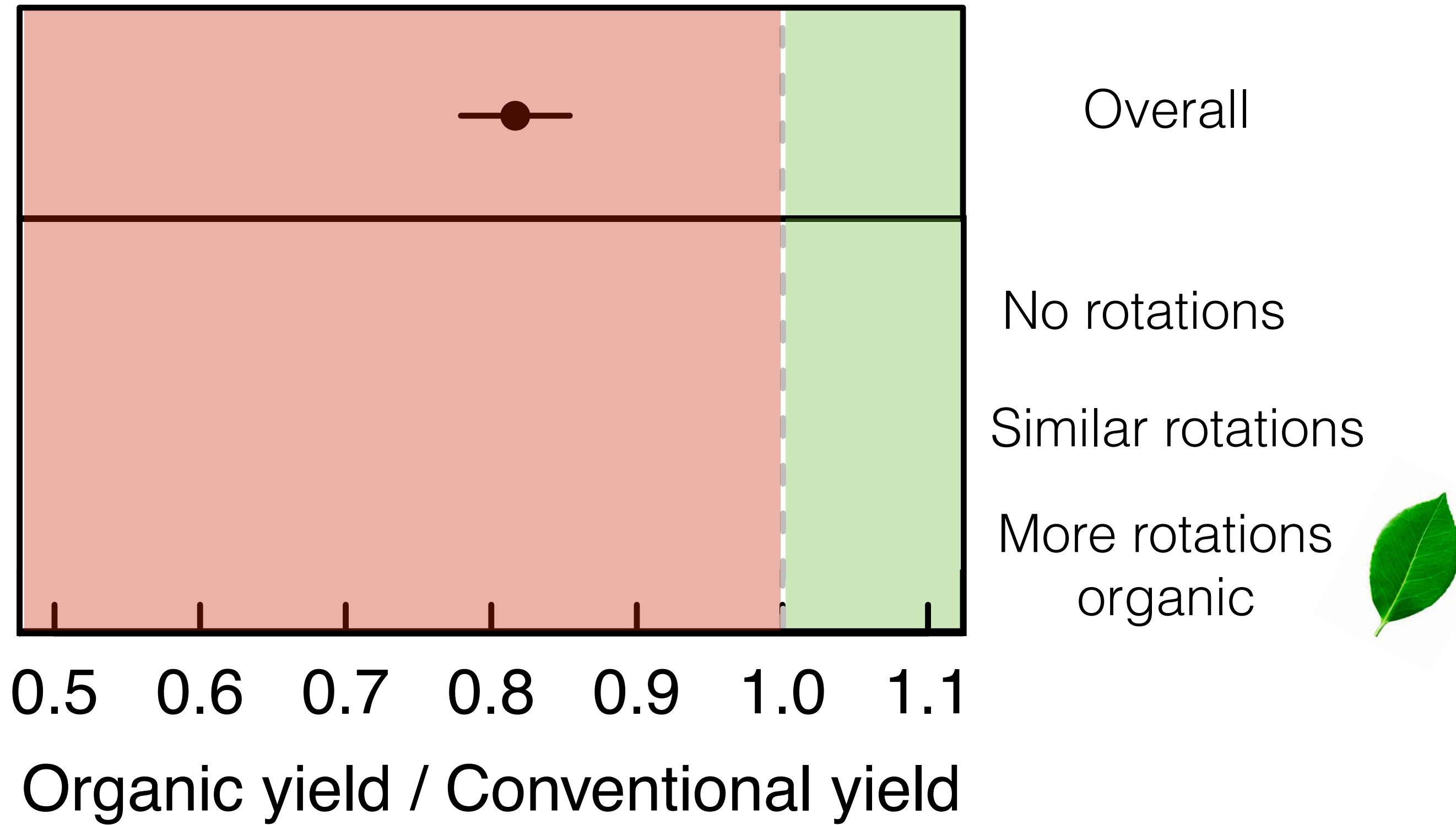
Spatial Diversification



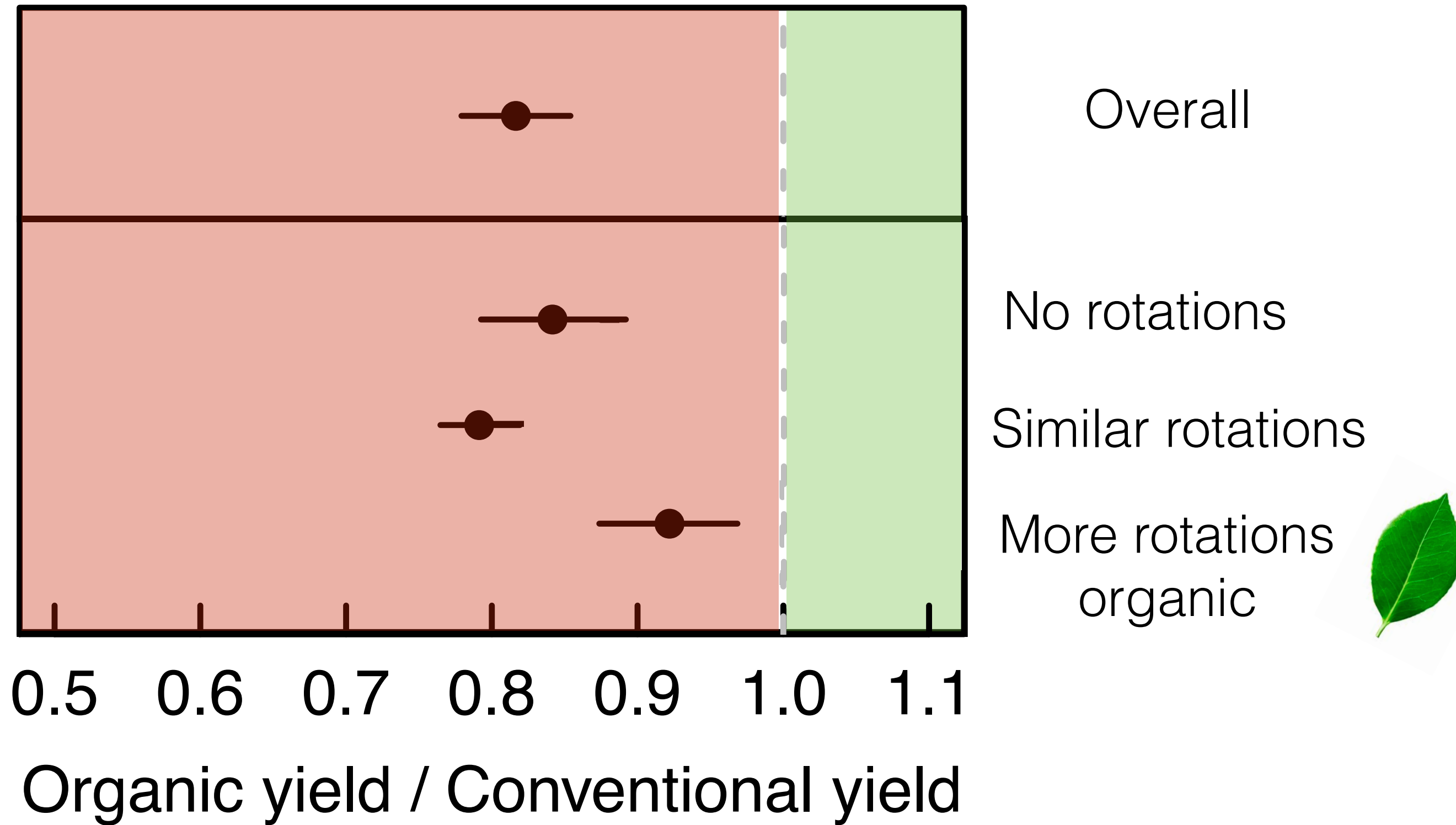
Temporal Diversification



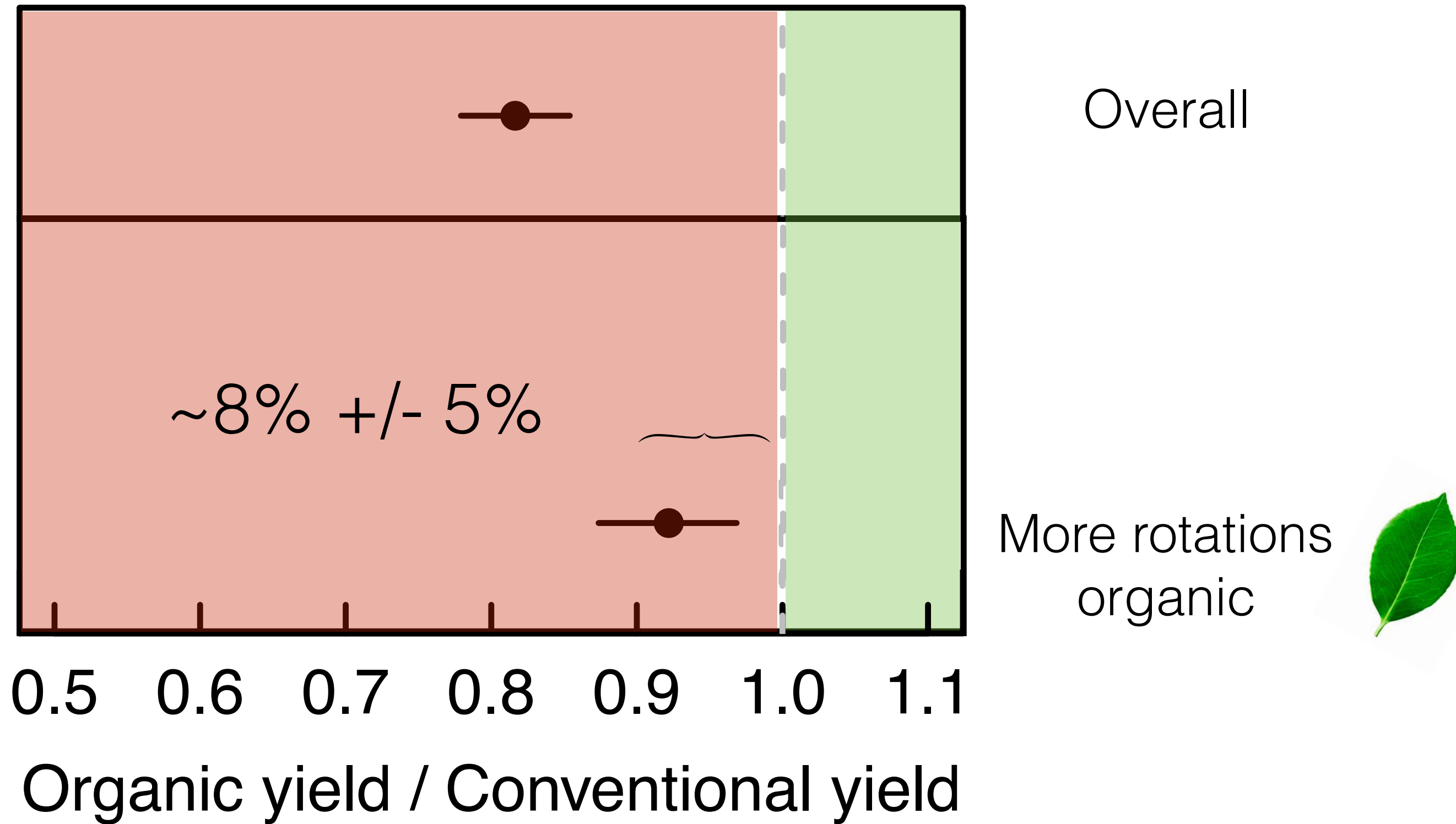
Temporal Diversification



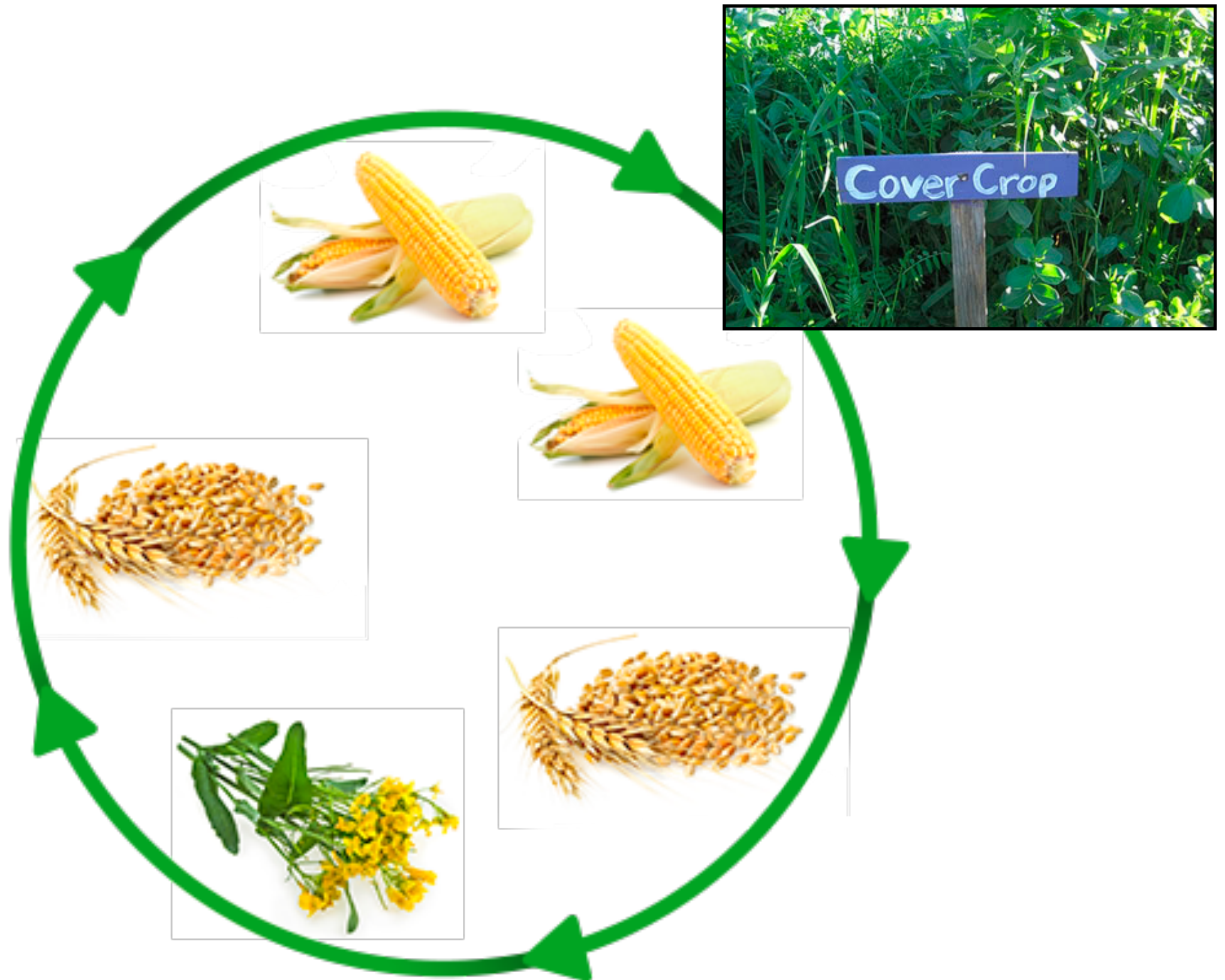
Temporal Diversification



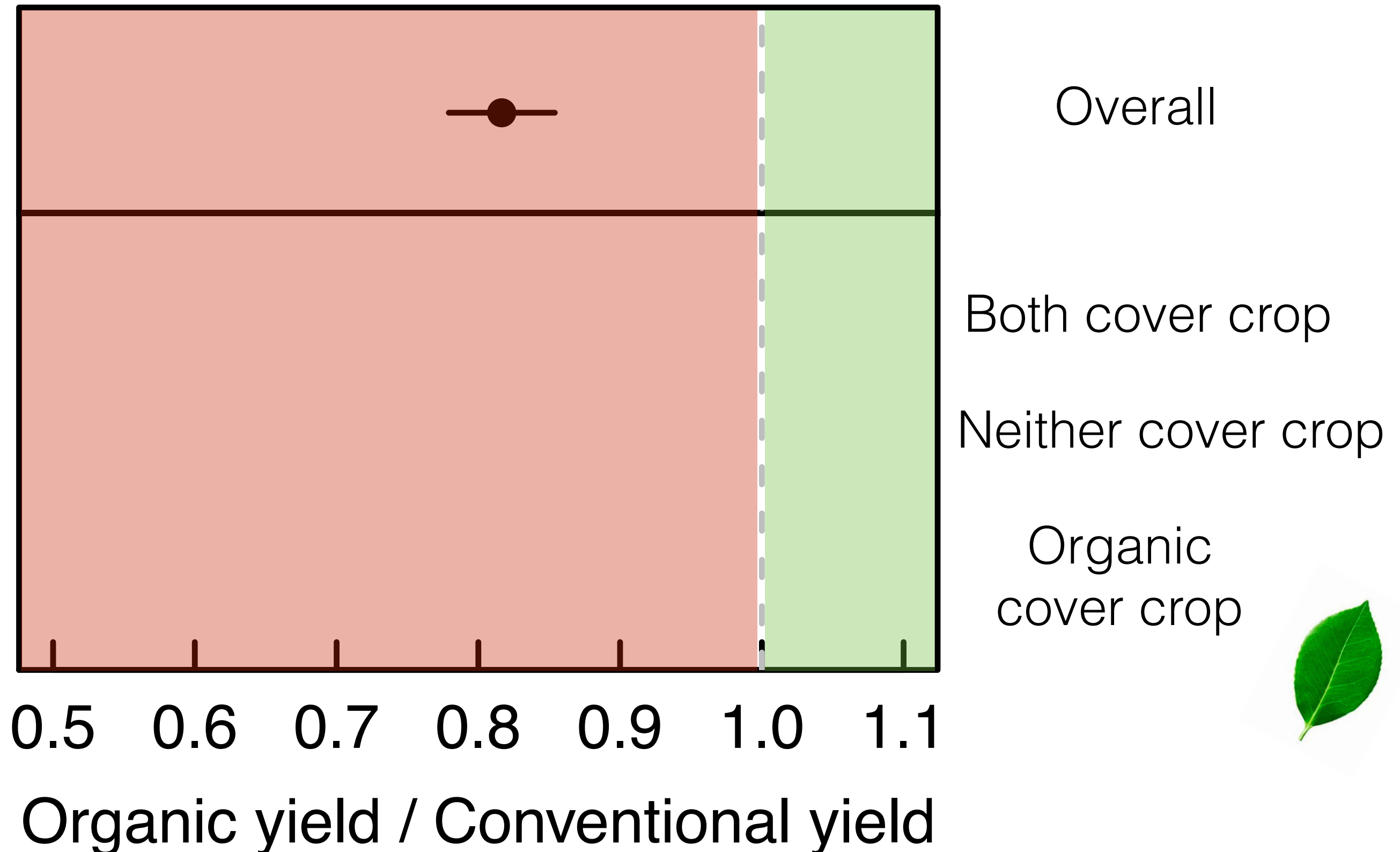
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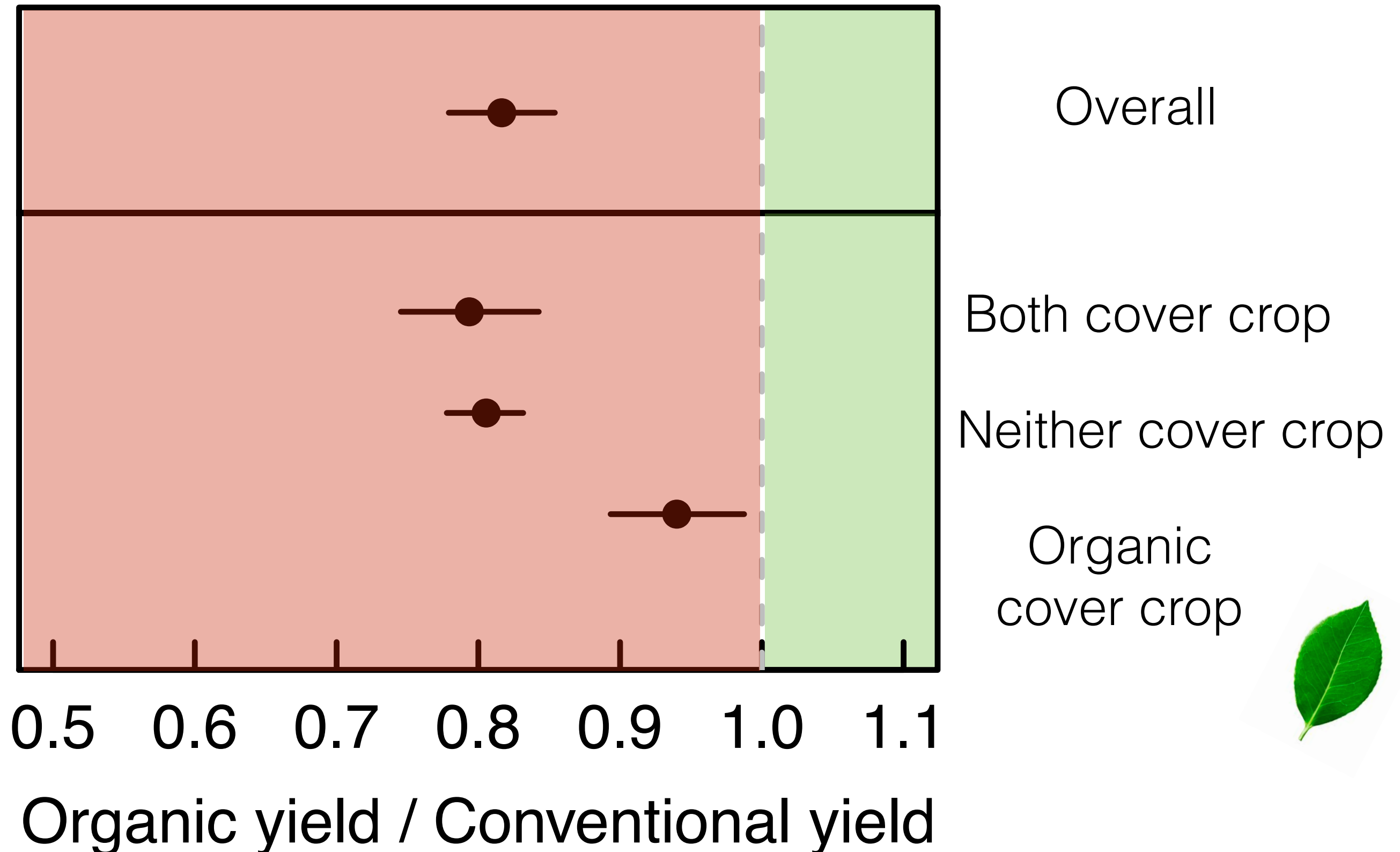
Temporal Diversification



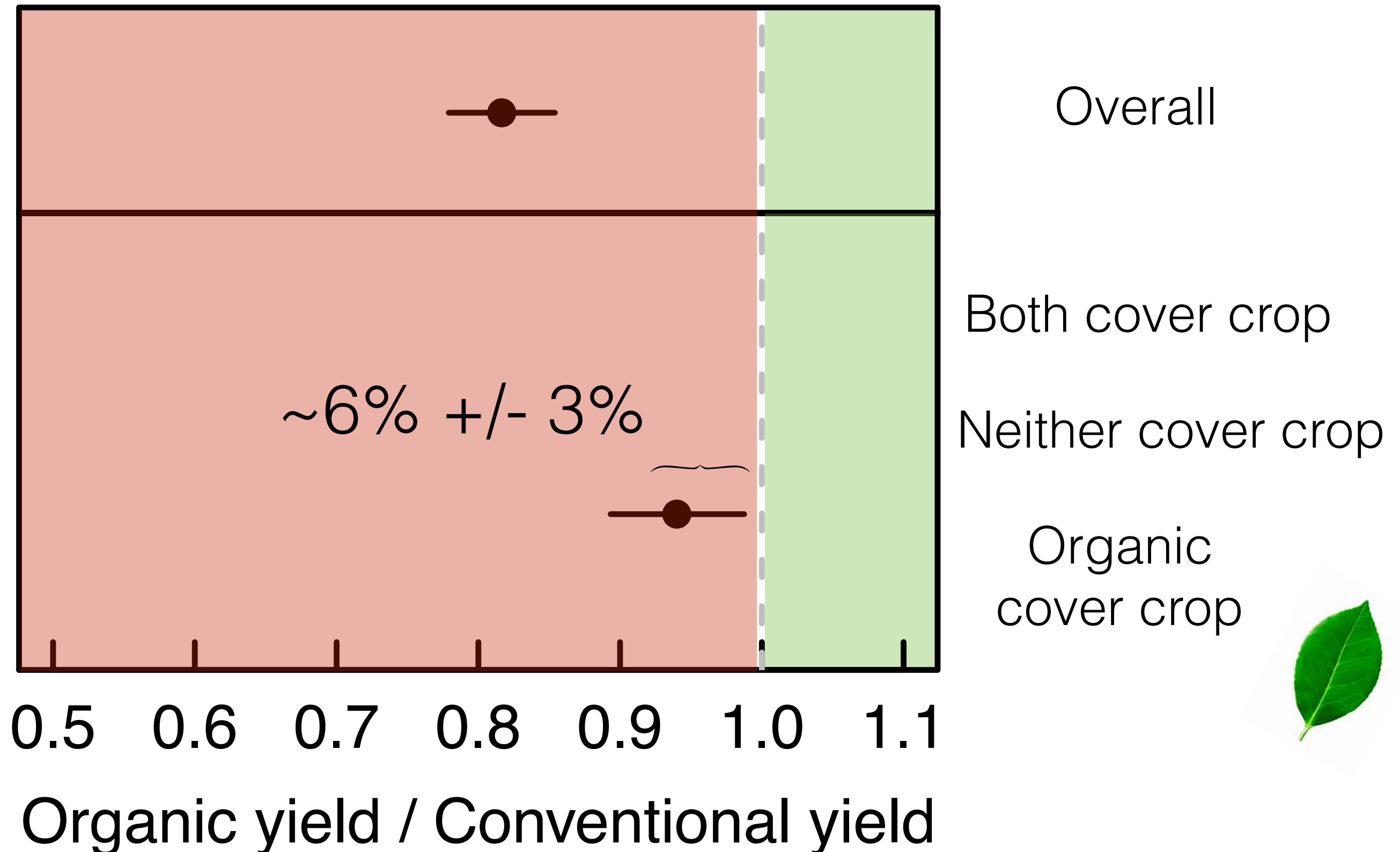
Temporal Diversification

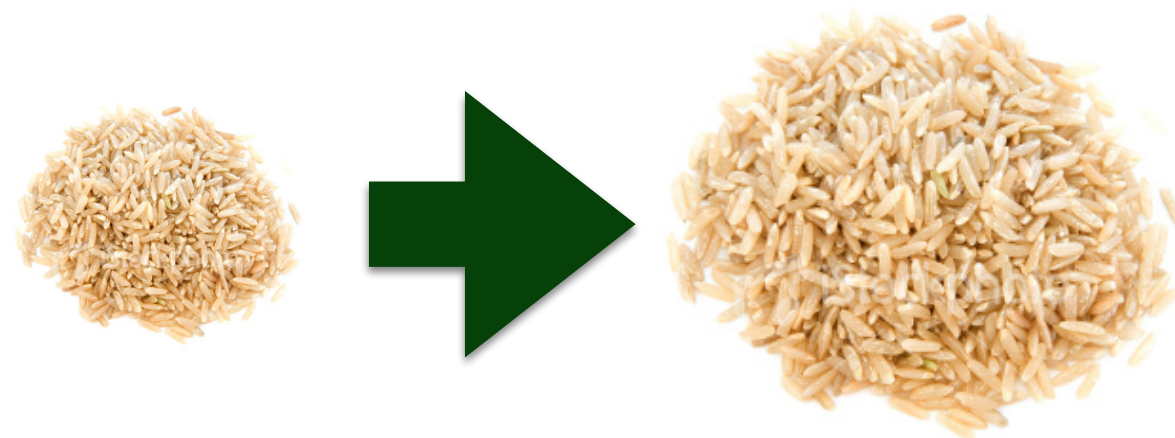
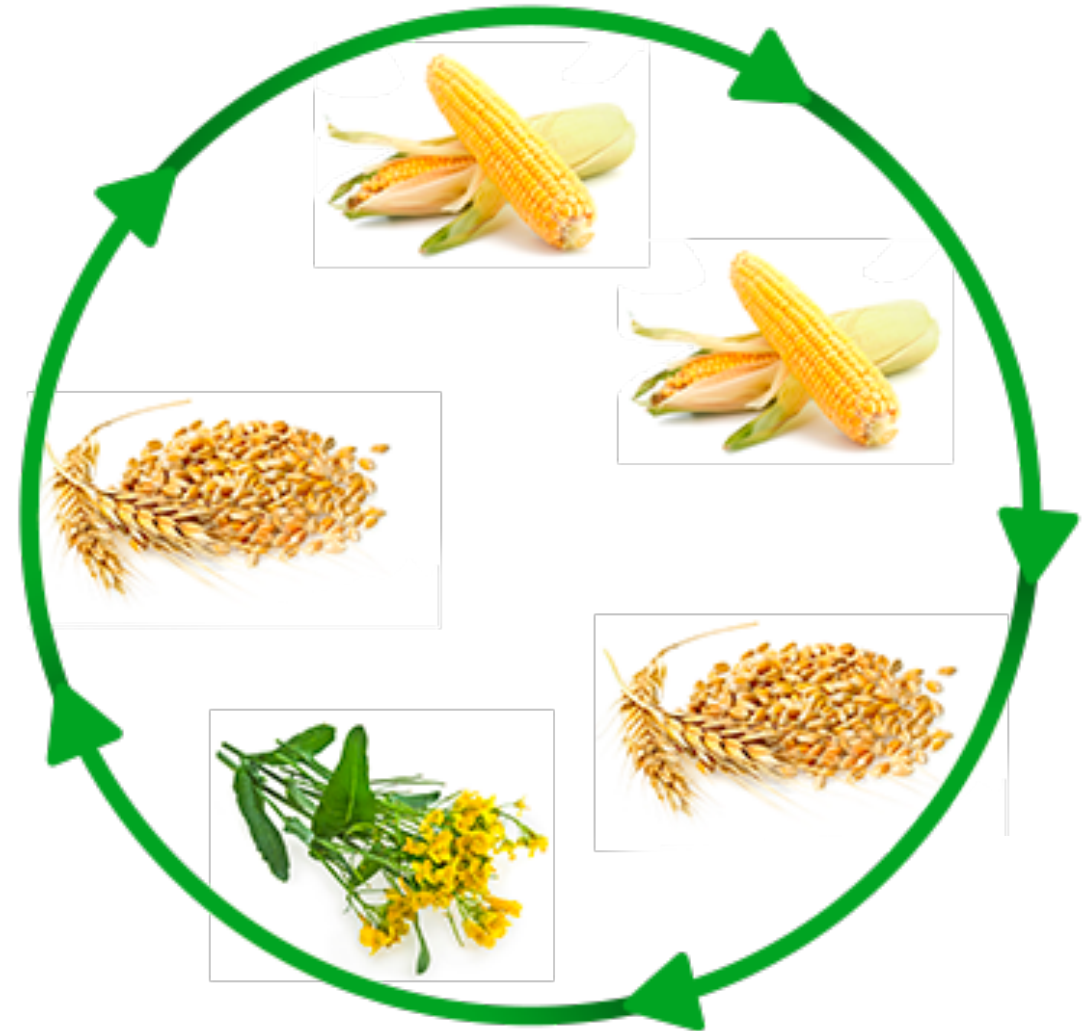


Temporal Diversification



Temporal Diversification





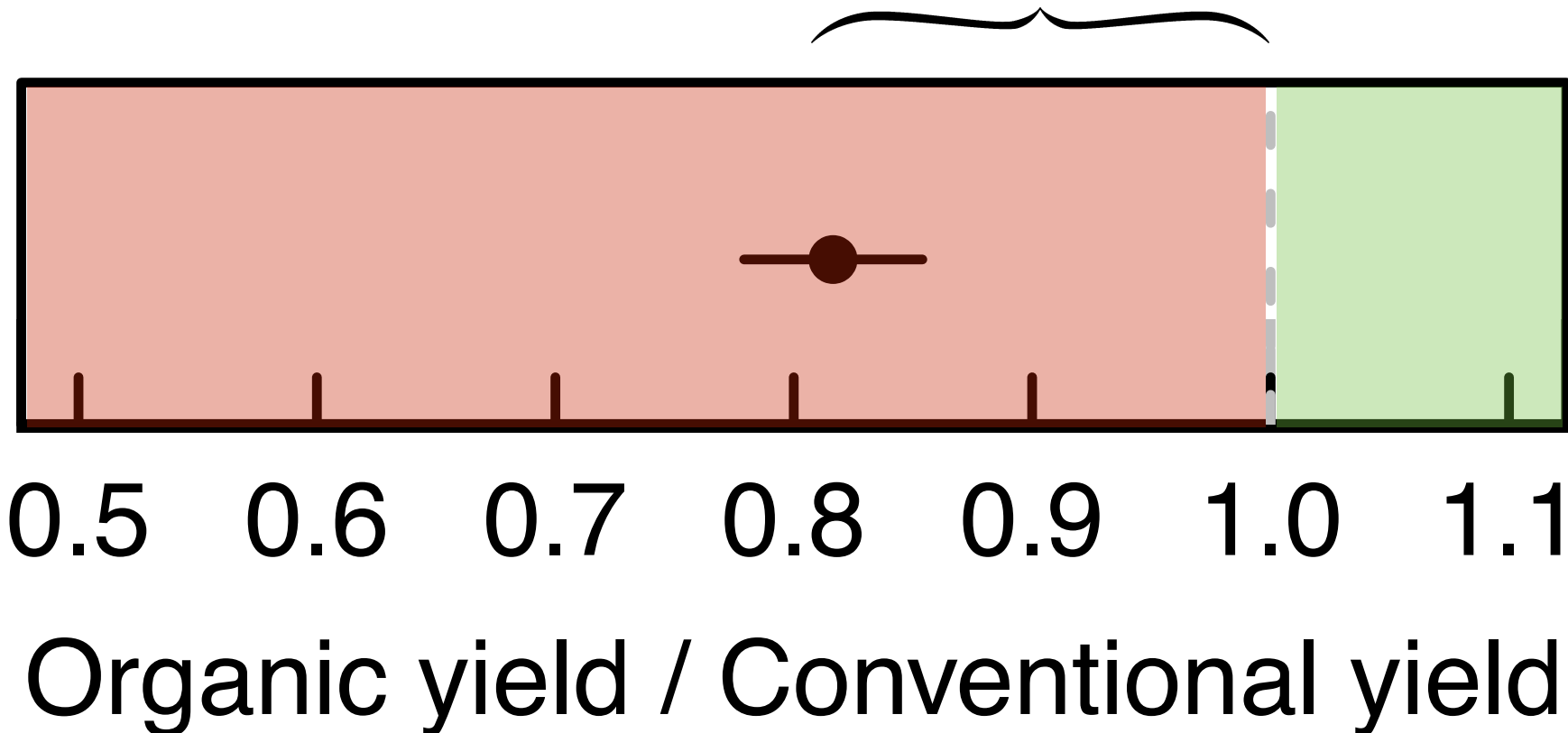


Continuous corn v. corn-soybean rotation

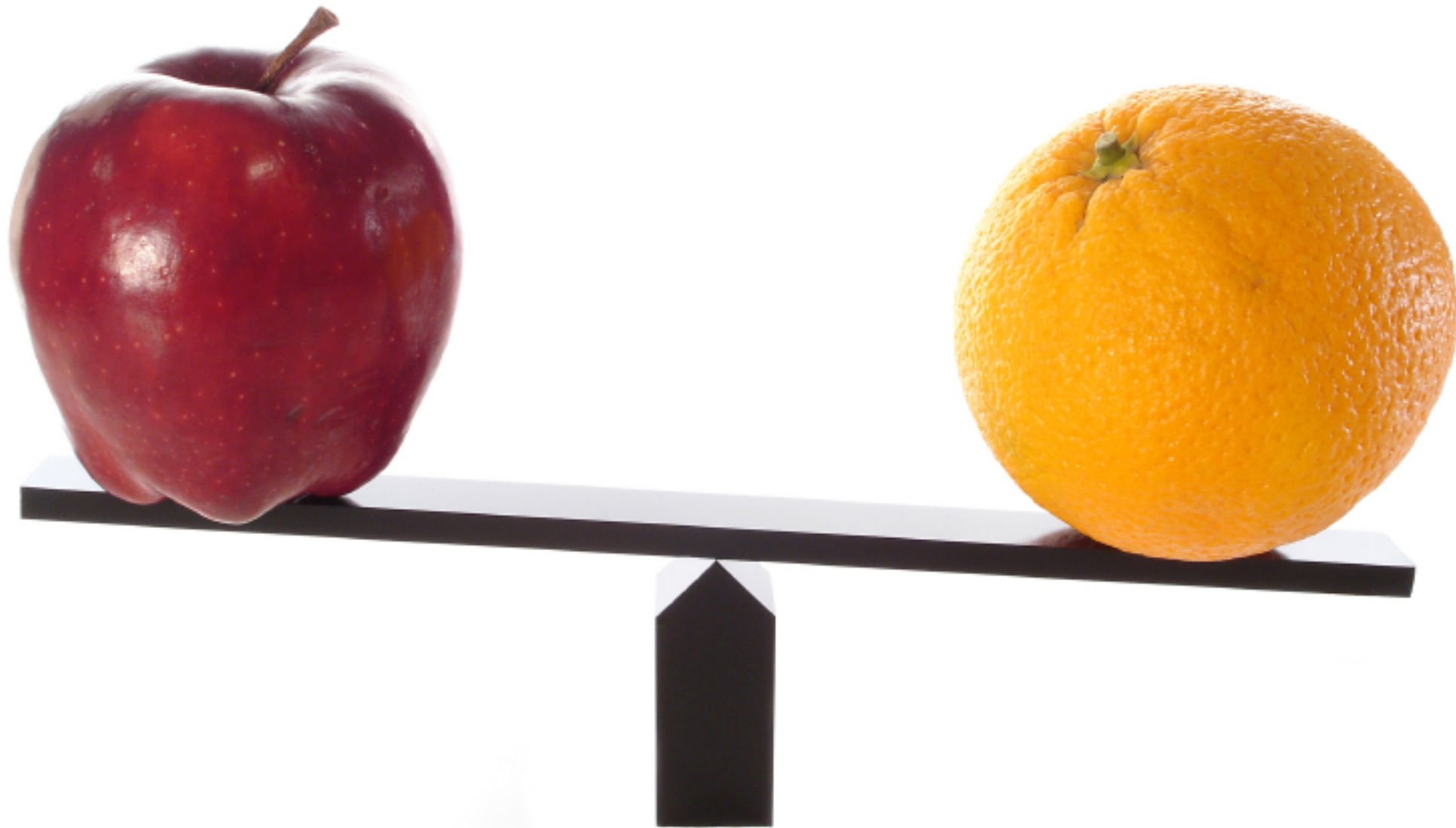


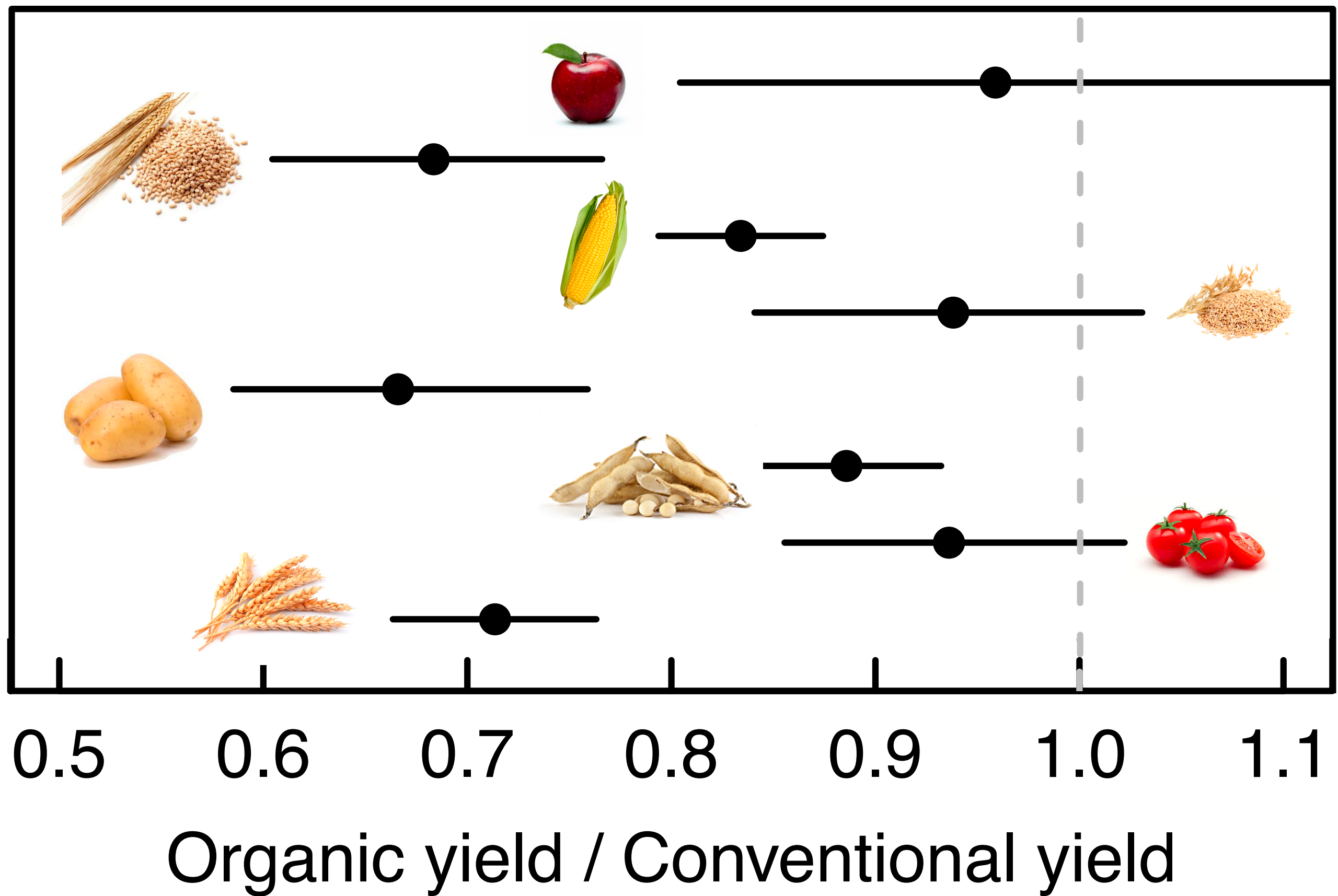
Caveats to these estimates

$\sim 19\% \pm 4\%$



Caveats to these estimates



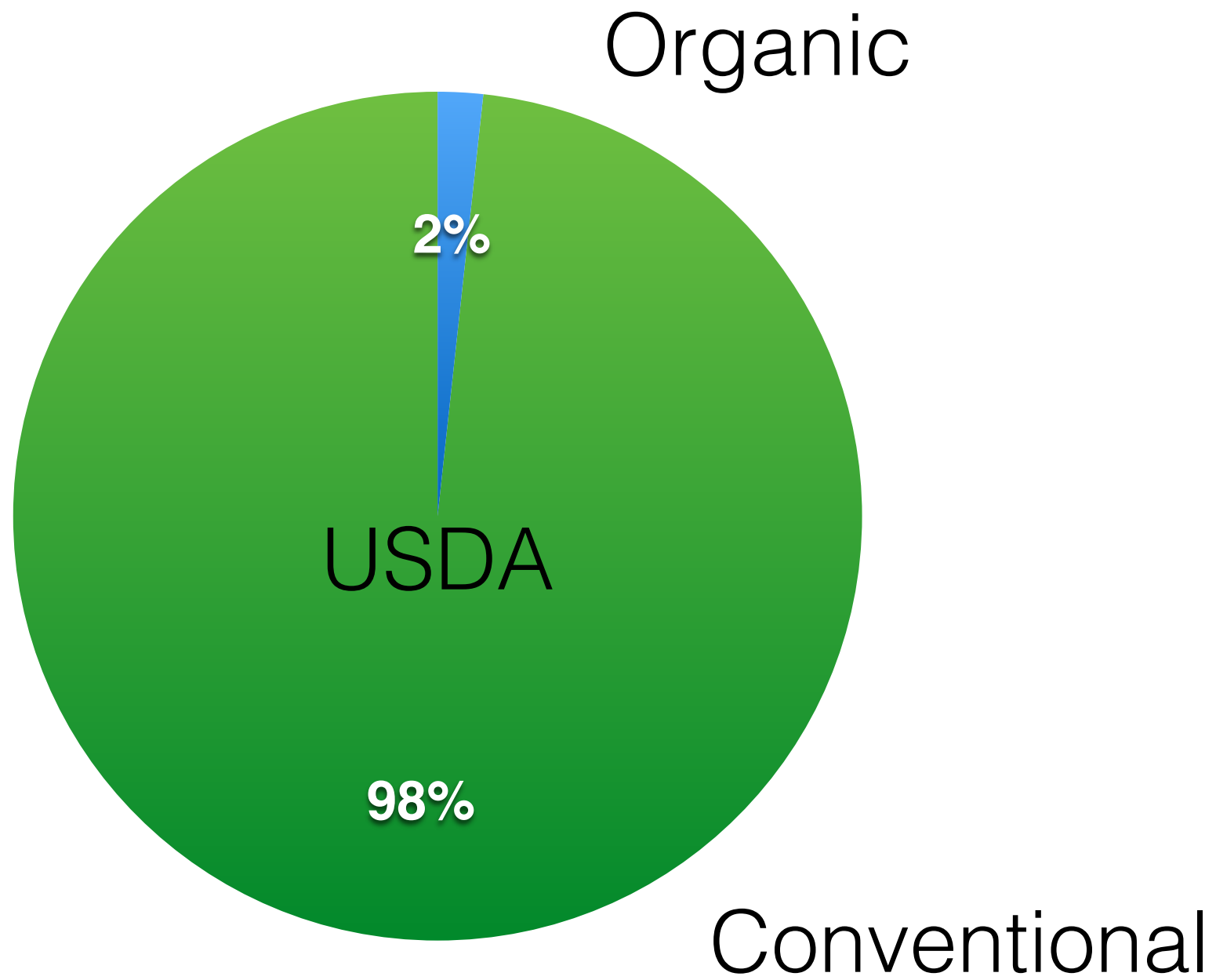


Caveats to these estimates

R&D

Caveats to these estimates

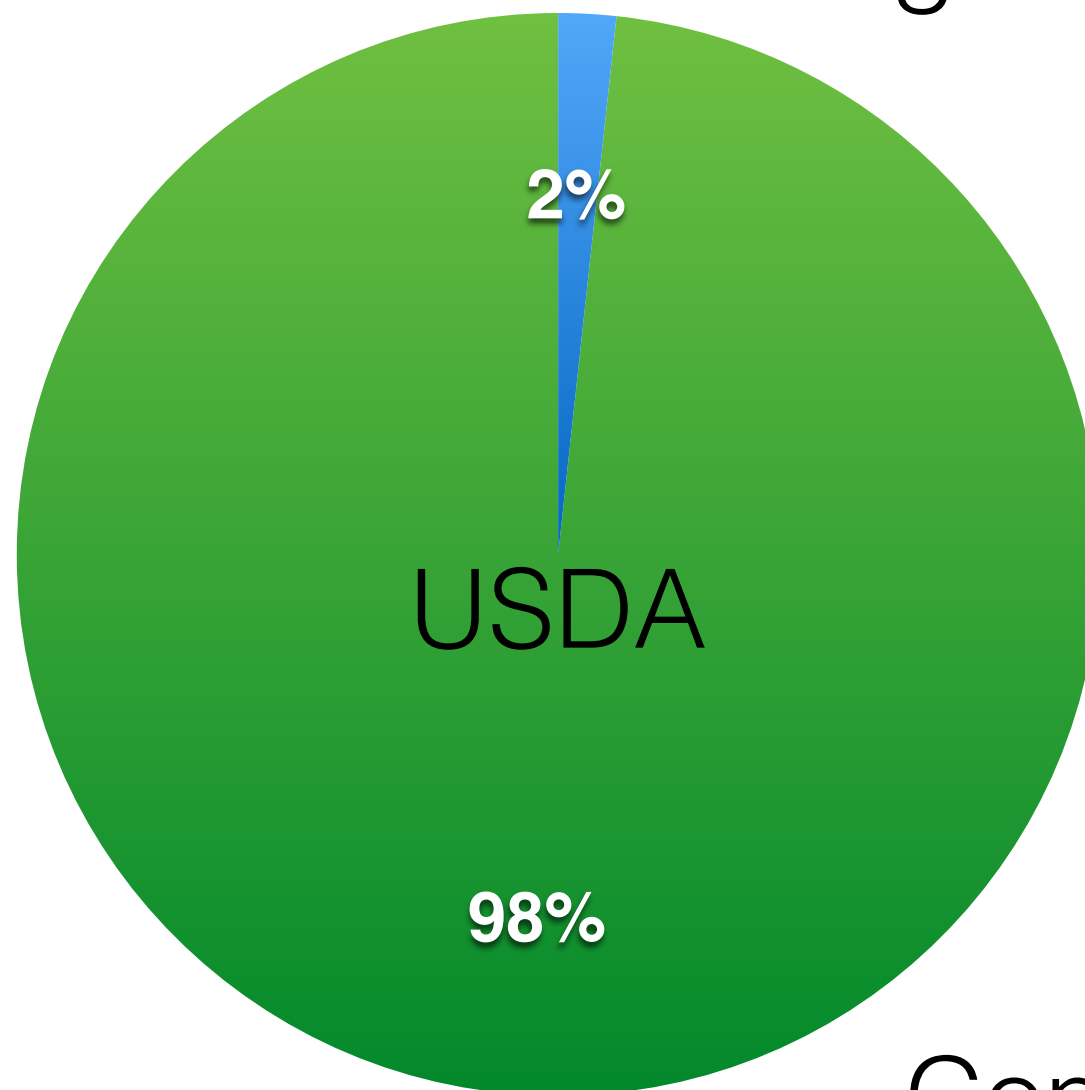
R&D



Caveats to these estimates

R&D

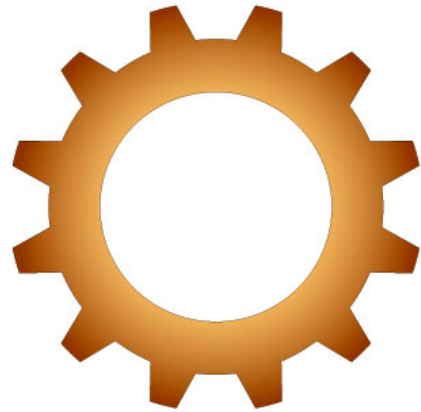
Organic



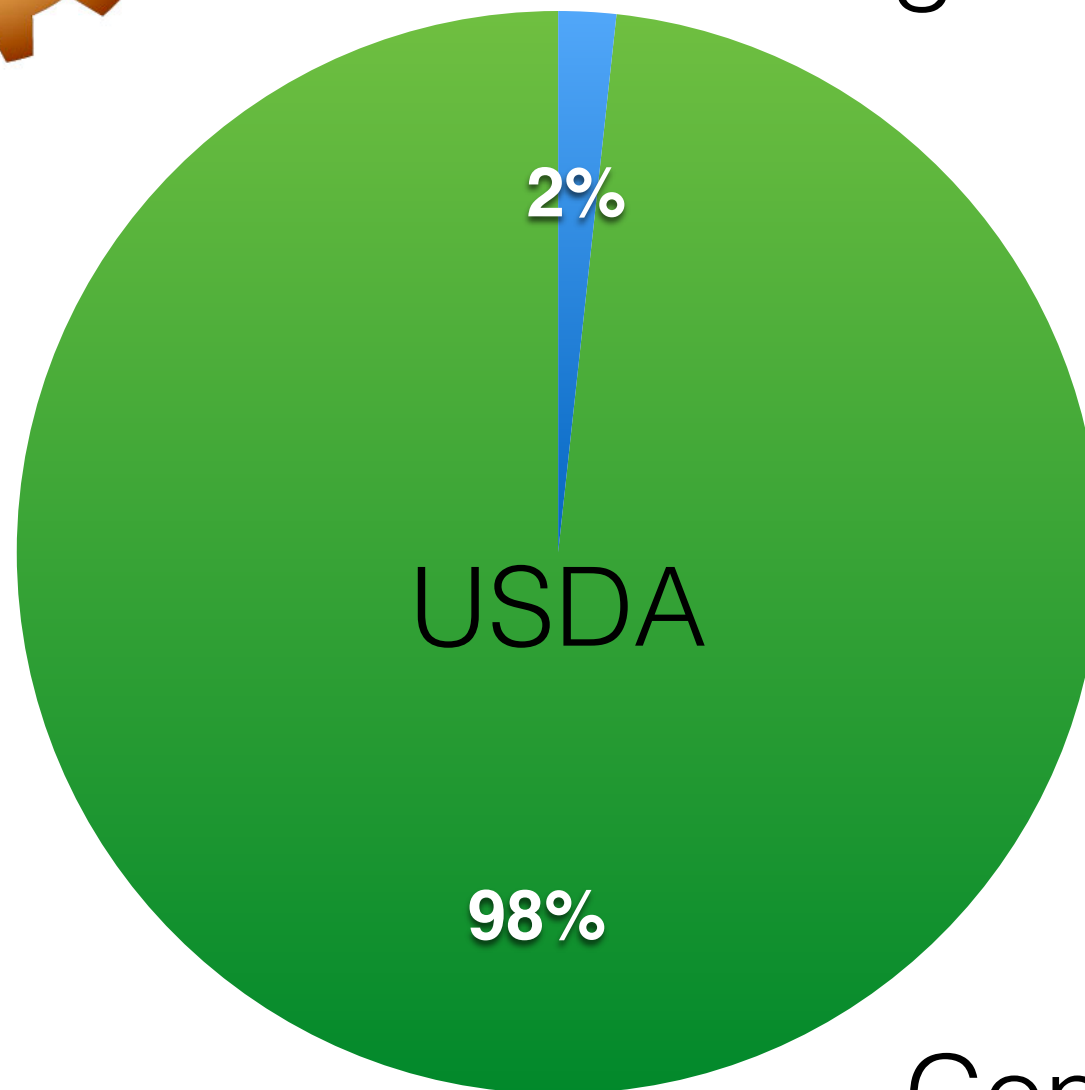
Conventional

Caveats to these estimates

R&D



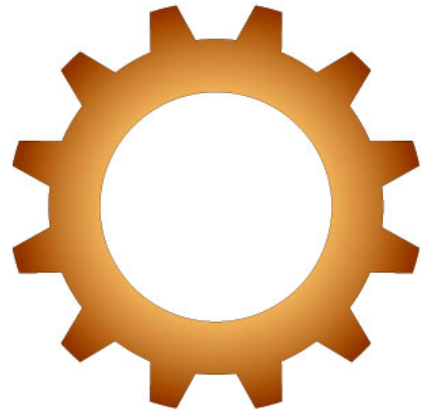
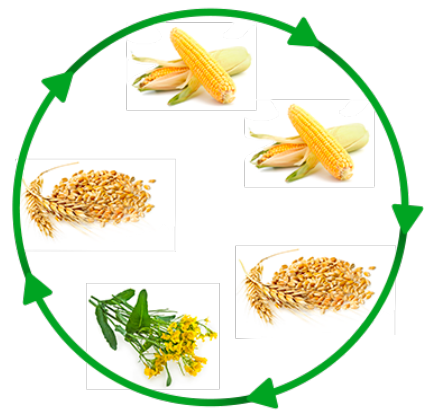
Organic



USDA

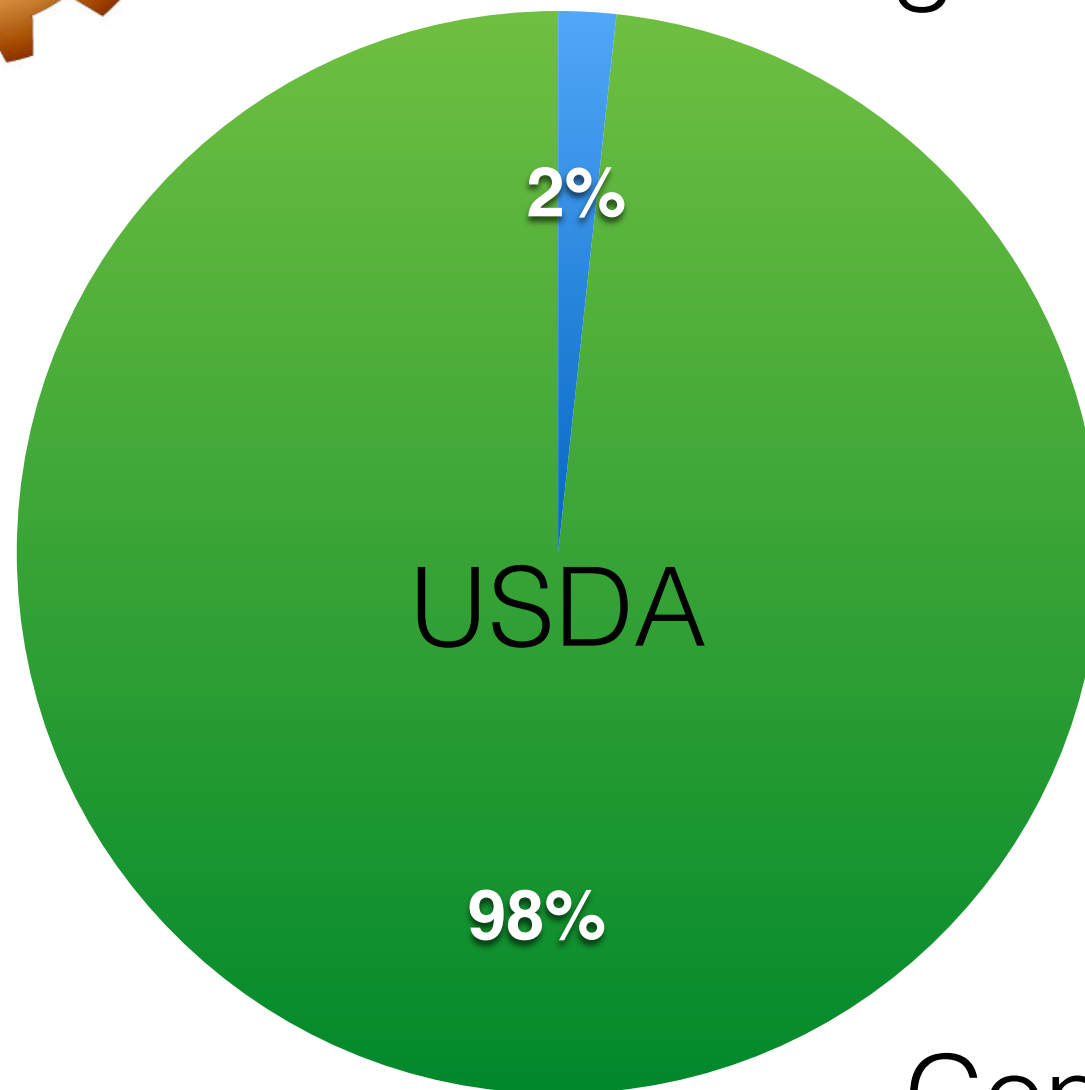
Conventional

Caveats to these estimates



R&D

Organic



Conventional

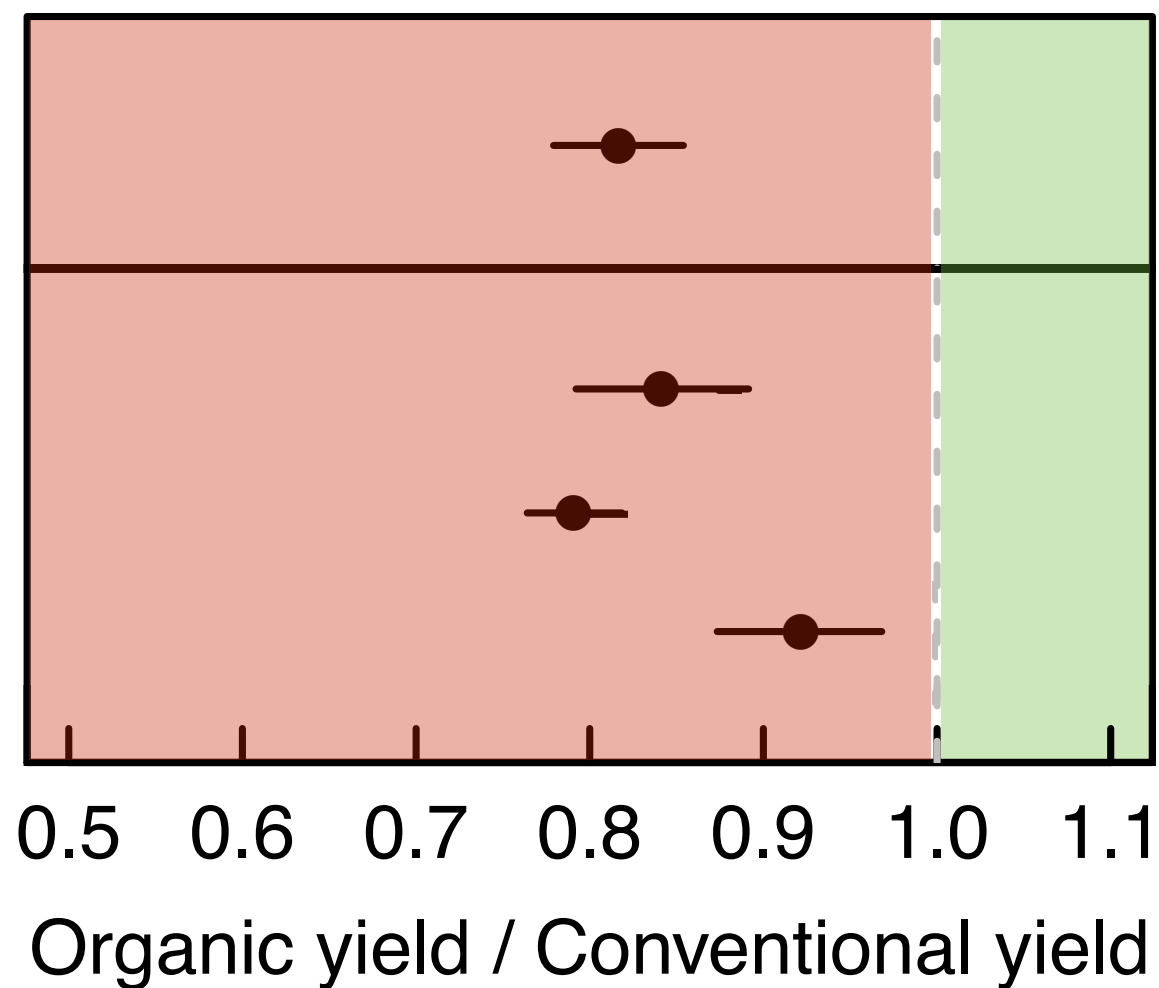


**1 billion
hungry**

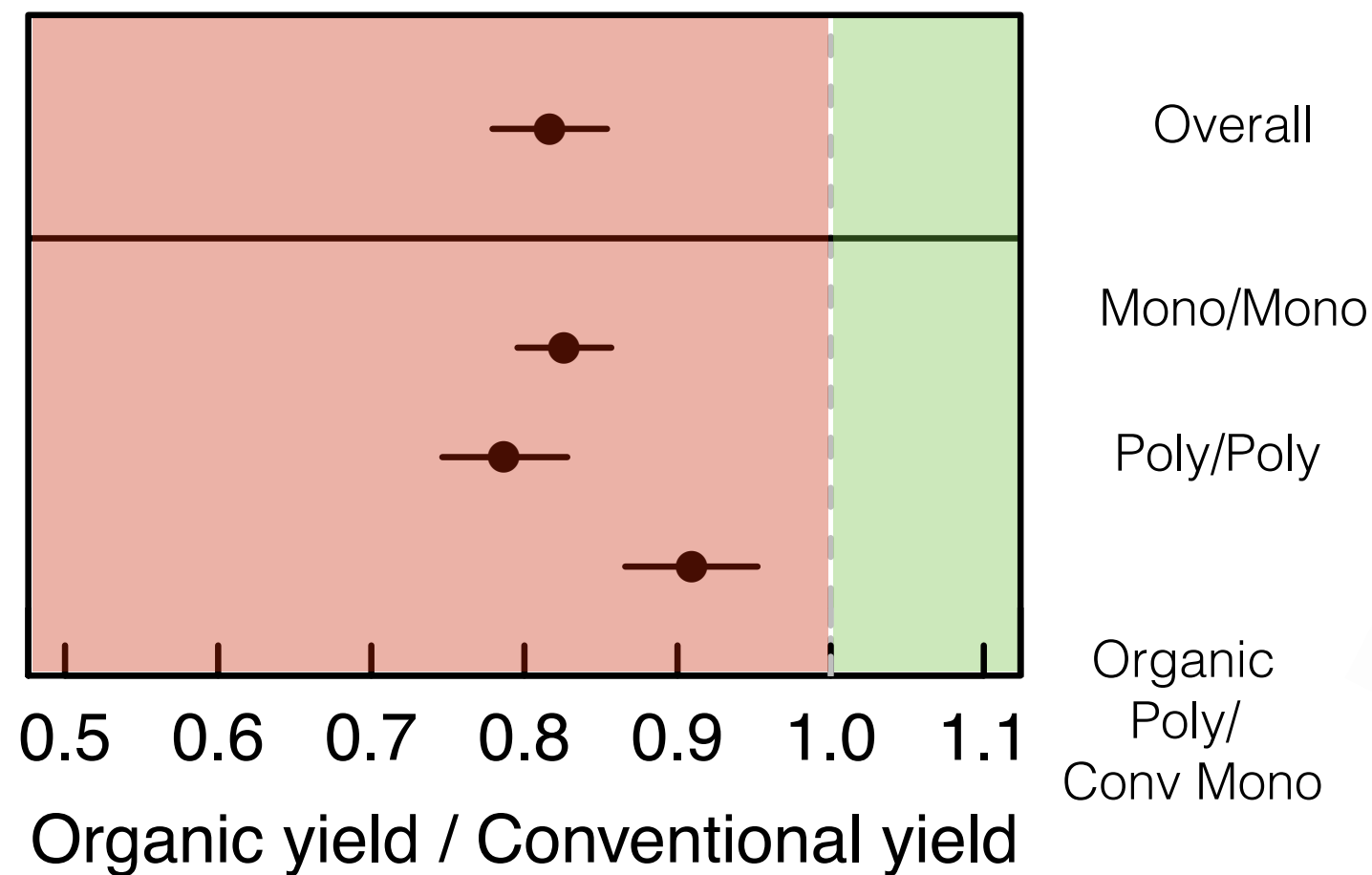
**1 billion
overweight**



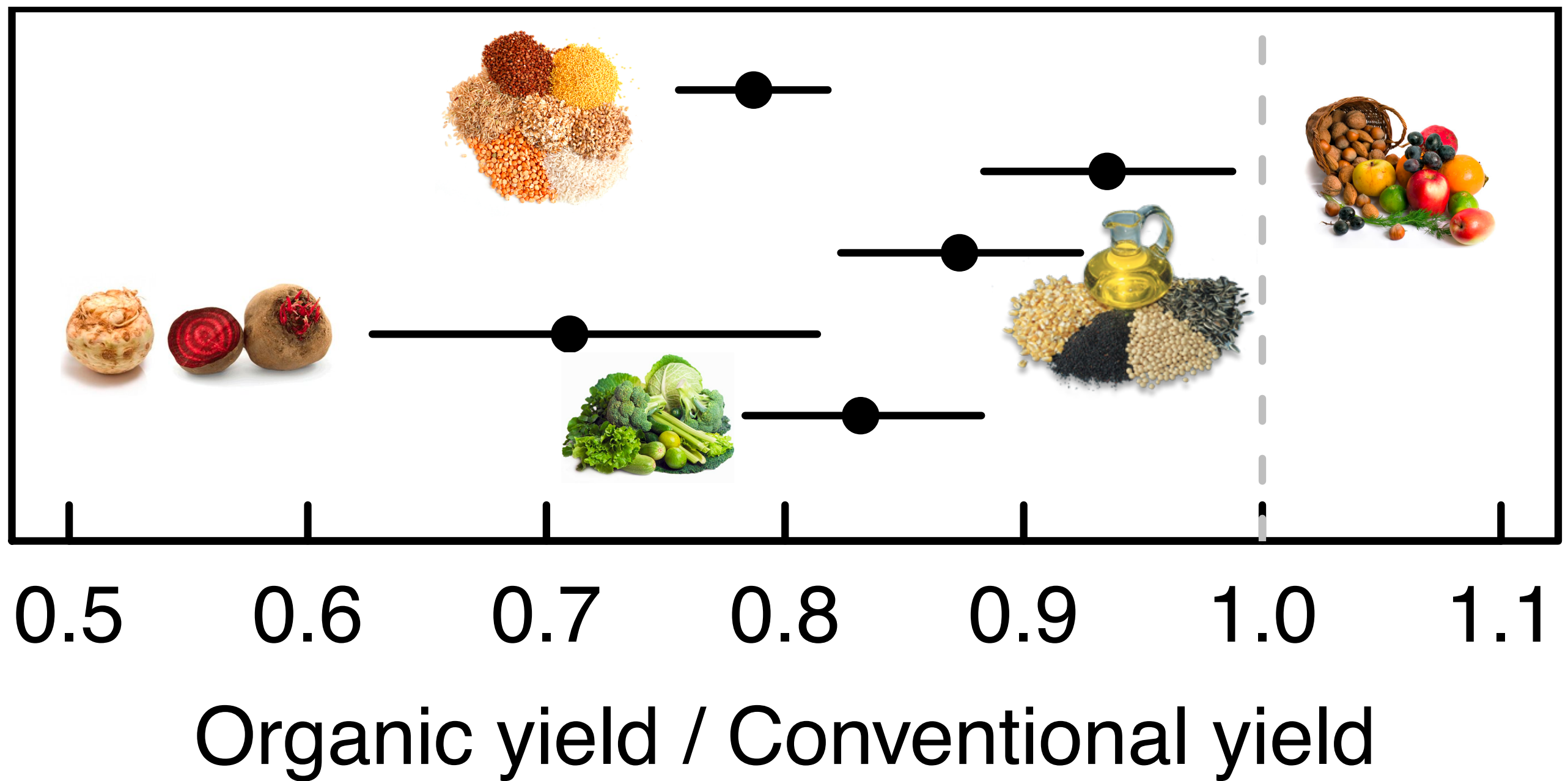
Temporal Diversification



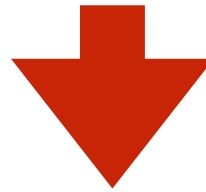
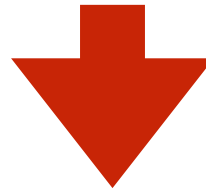
Spatial Diversification



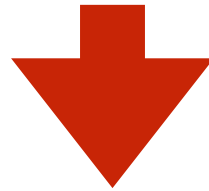
additional slides



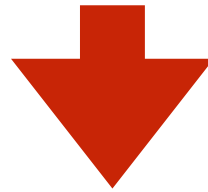
Caveats to these estimates



Caveats to these estimates



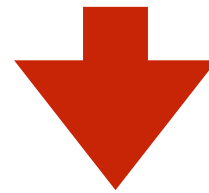
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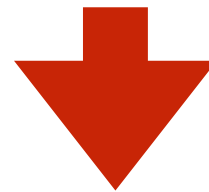
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Caveats to these estimates



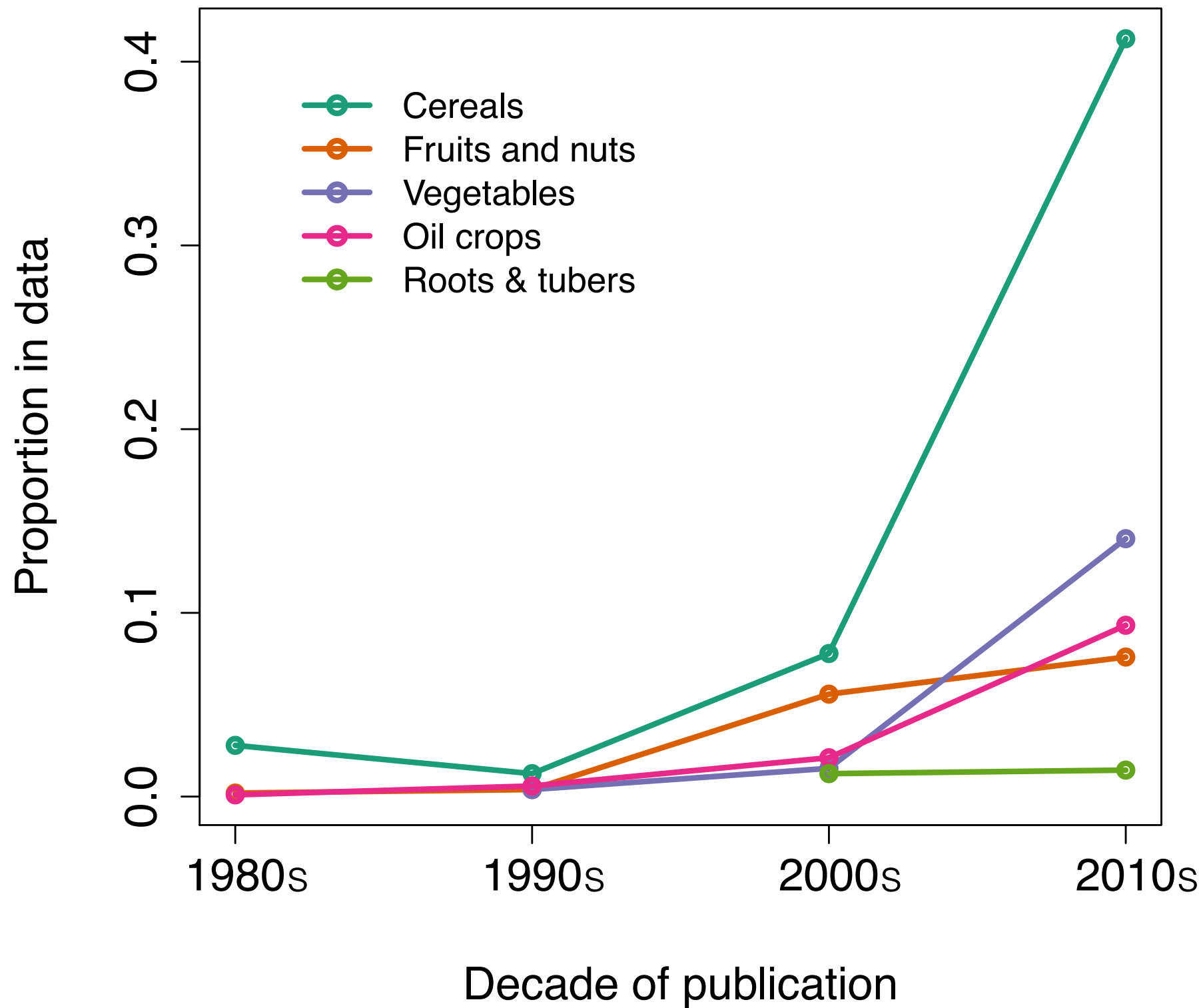
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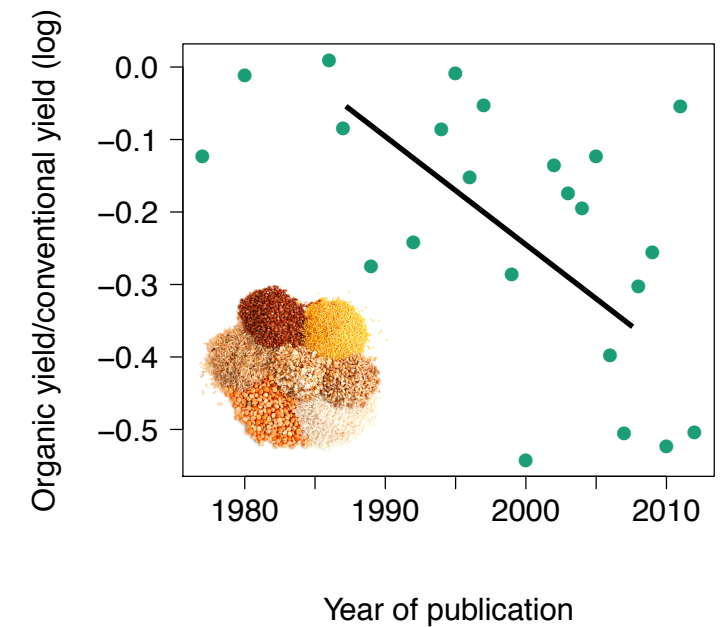
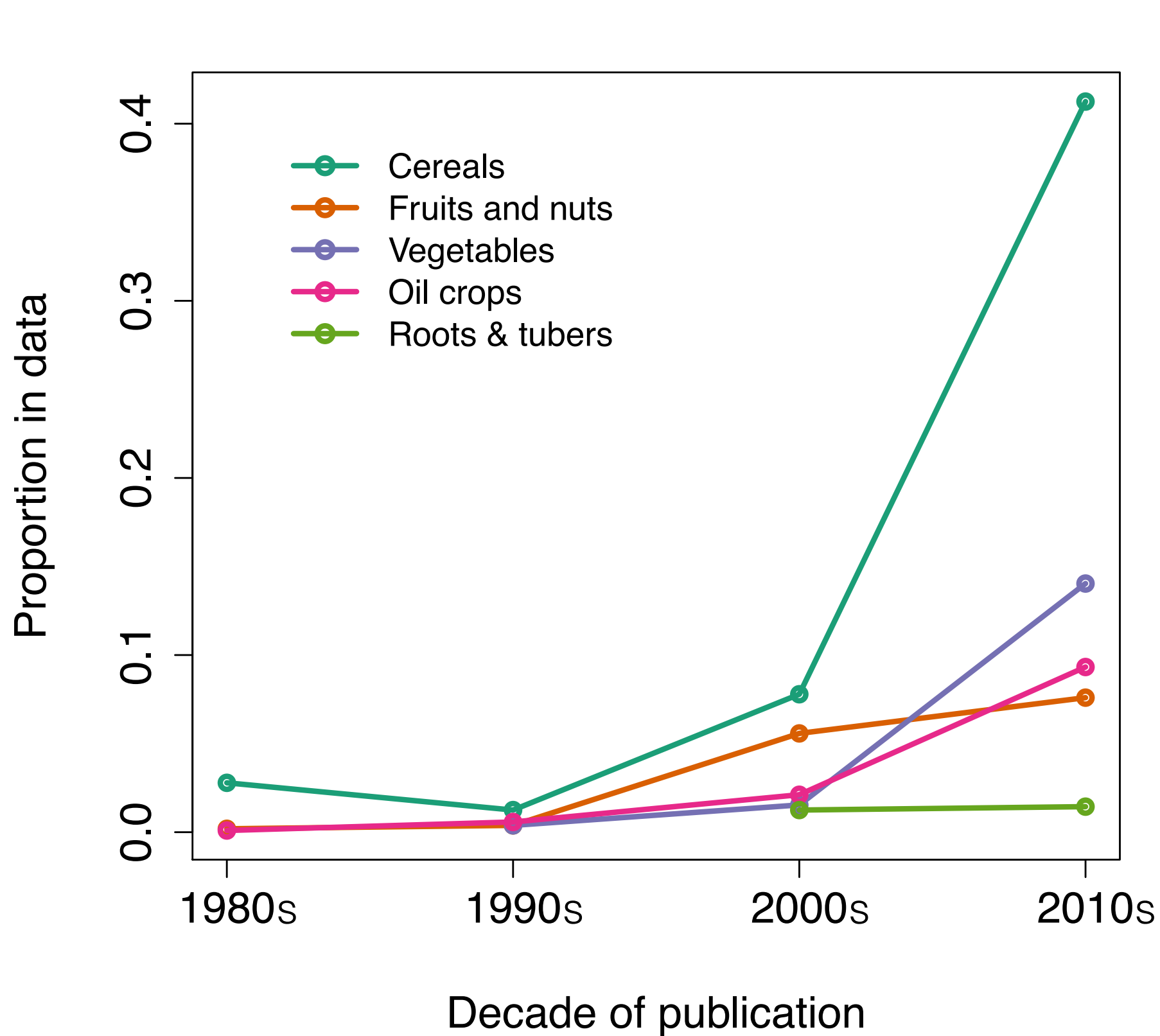
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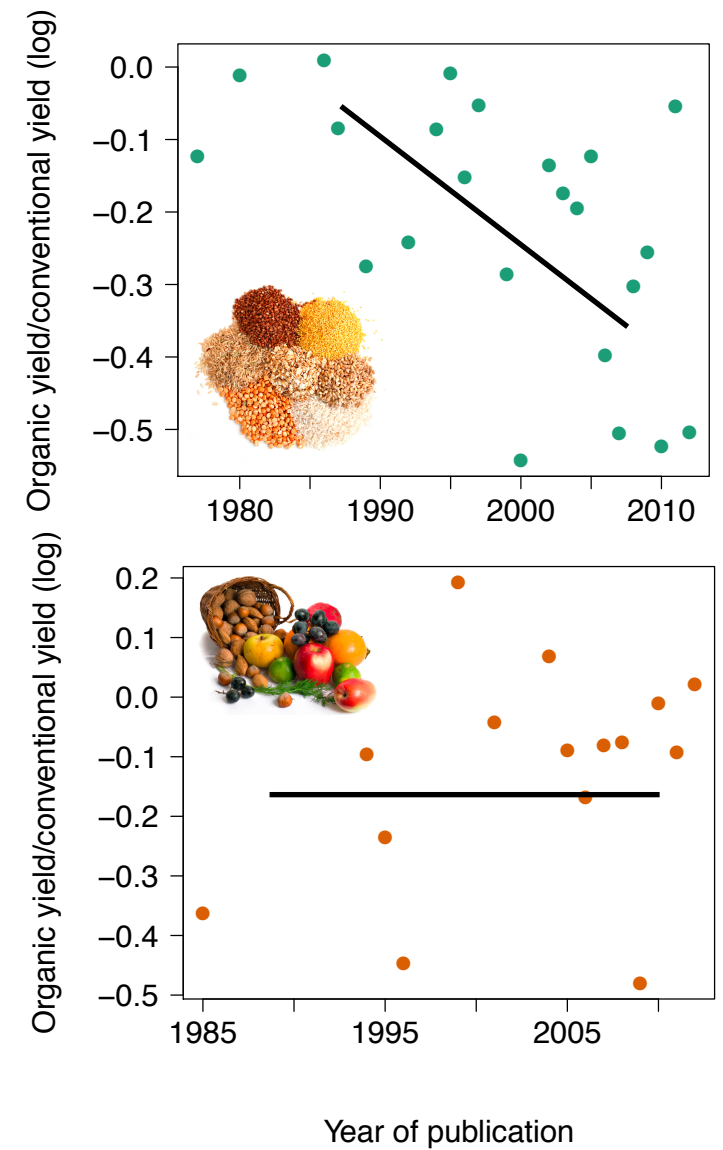
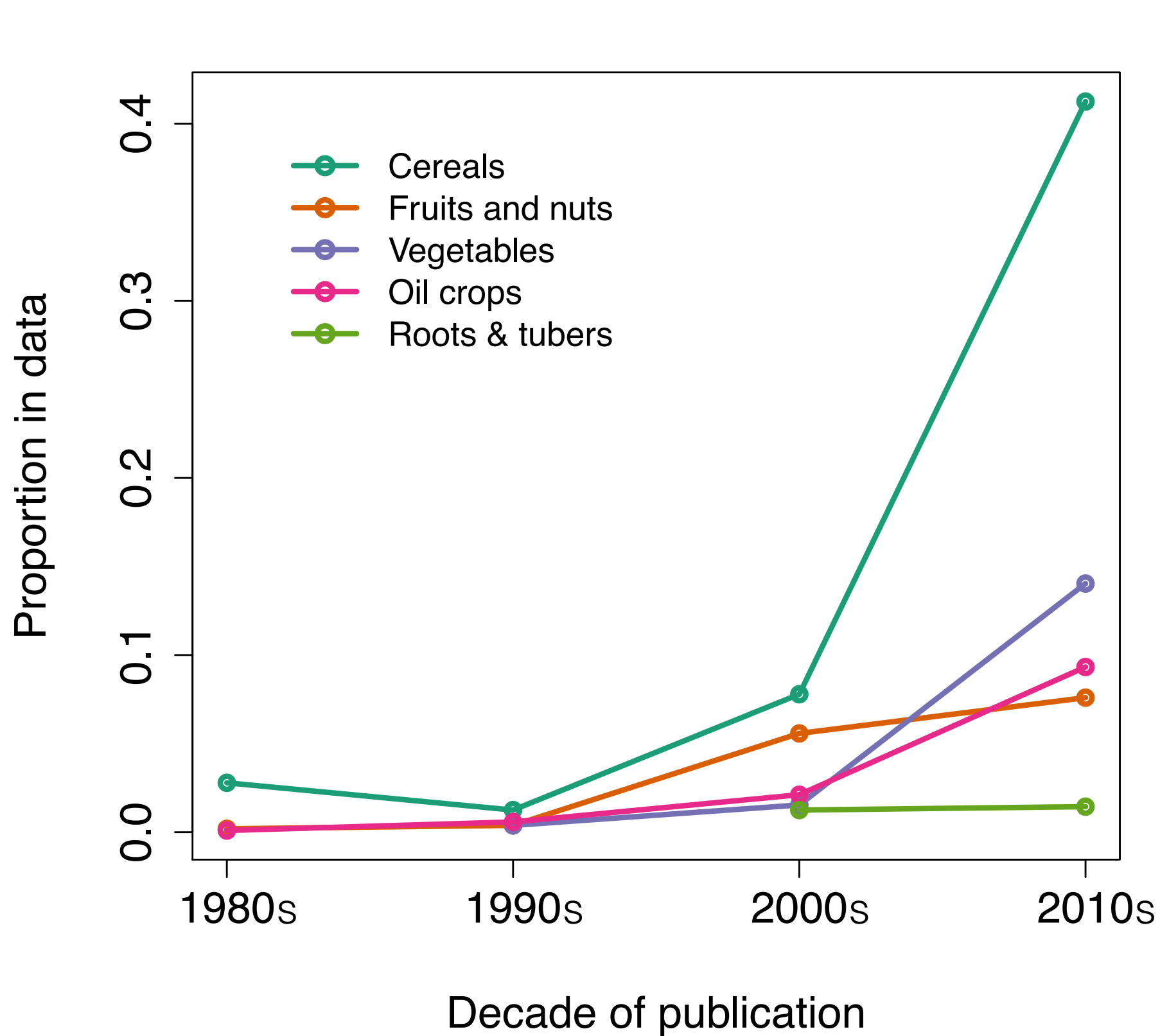
Caveats to these estimates



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