

What does the global literature tell us on the impact of pesticide reduction?



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Teagasc Oak Park

National Tillage Conference 2025

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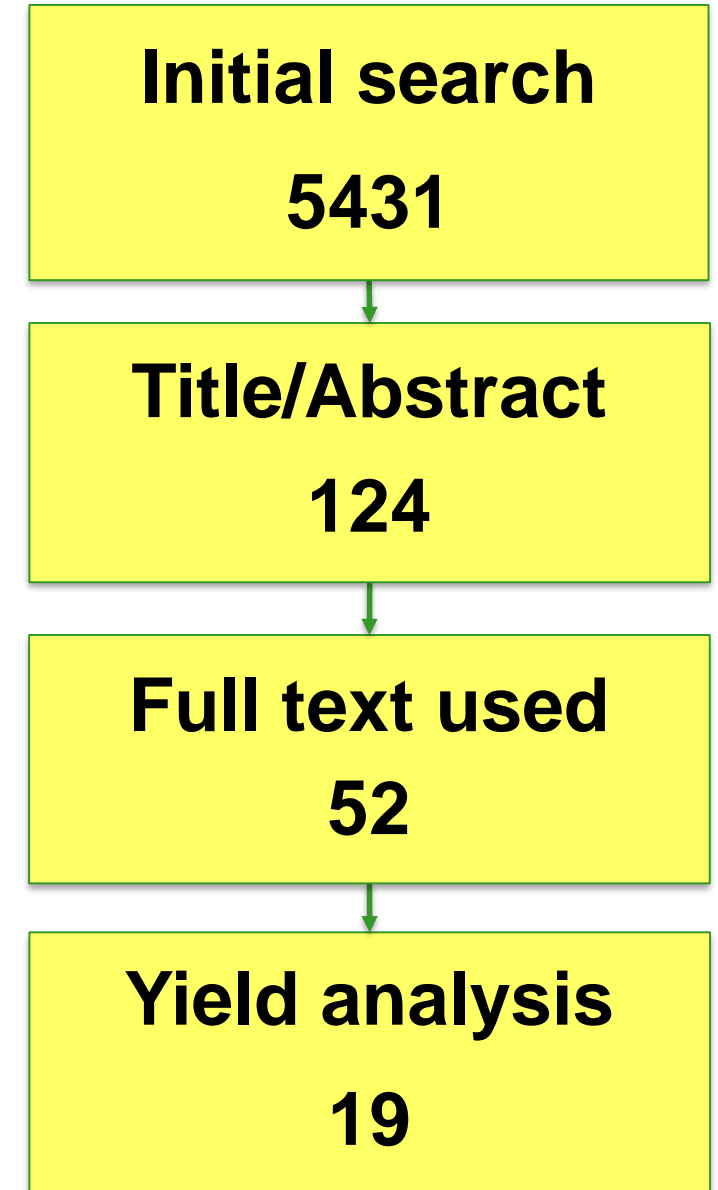
www.teagasc.ie/tillagecon25

First step: Map out a systematic review of the literature

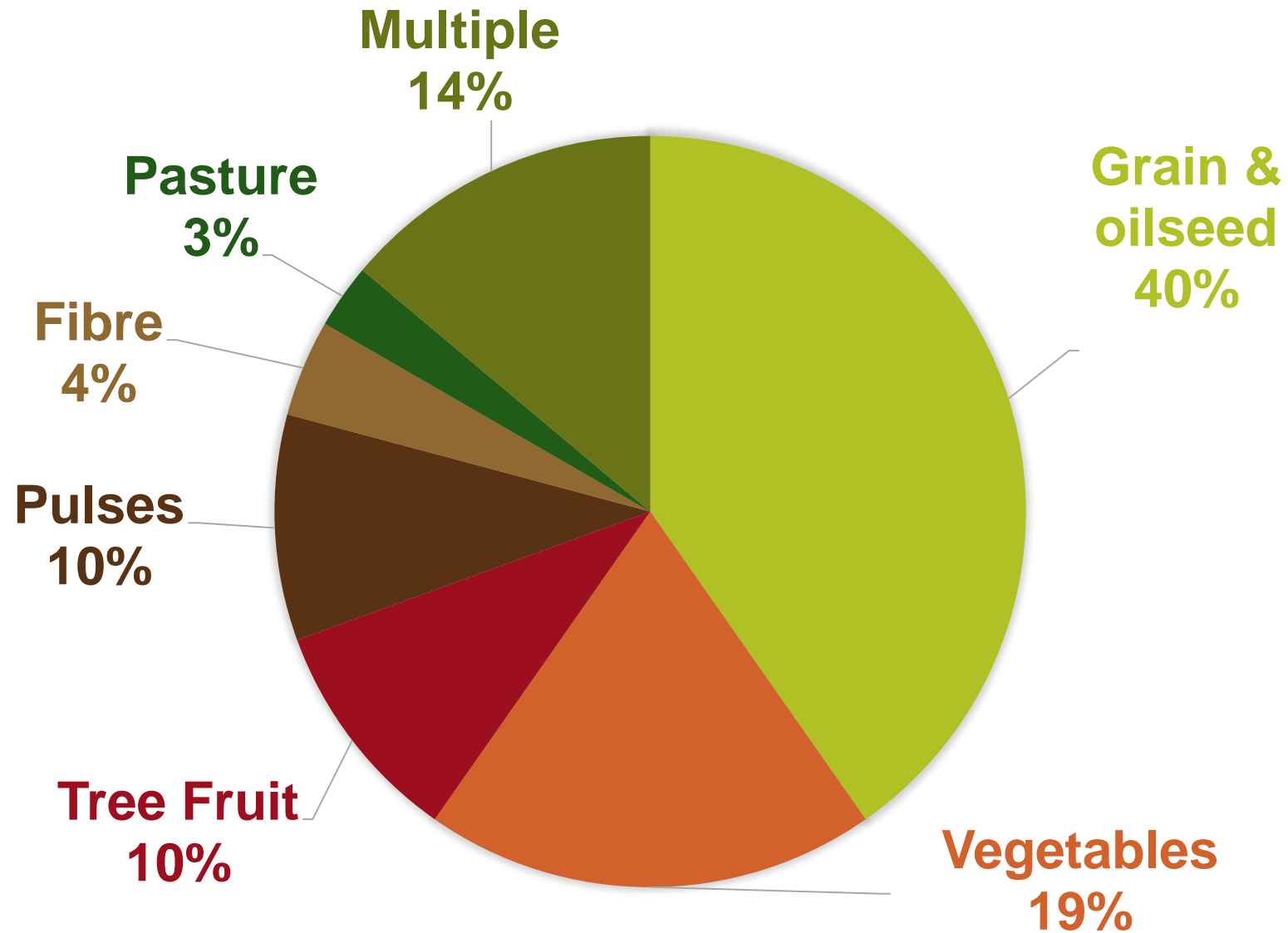
- Looking at the impact of pesticide reduction on crop sustainability
 - Yield, income, and socio-environmental outcomes
- Identify trends and/or knowledge gaps
- Determine can this be used to estimate potential impacts for Irish production systems?

Literature review revealed limited data available

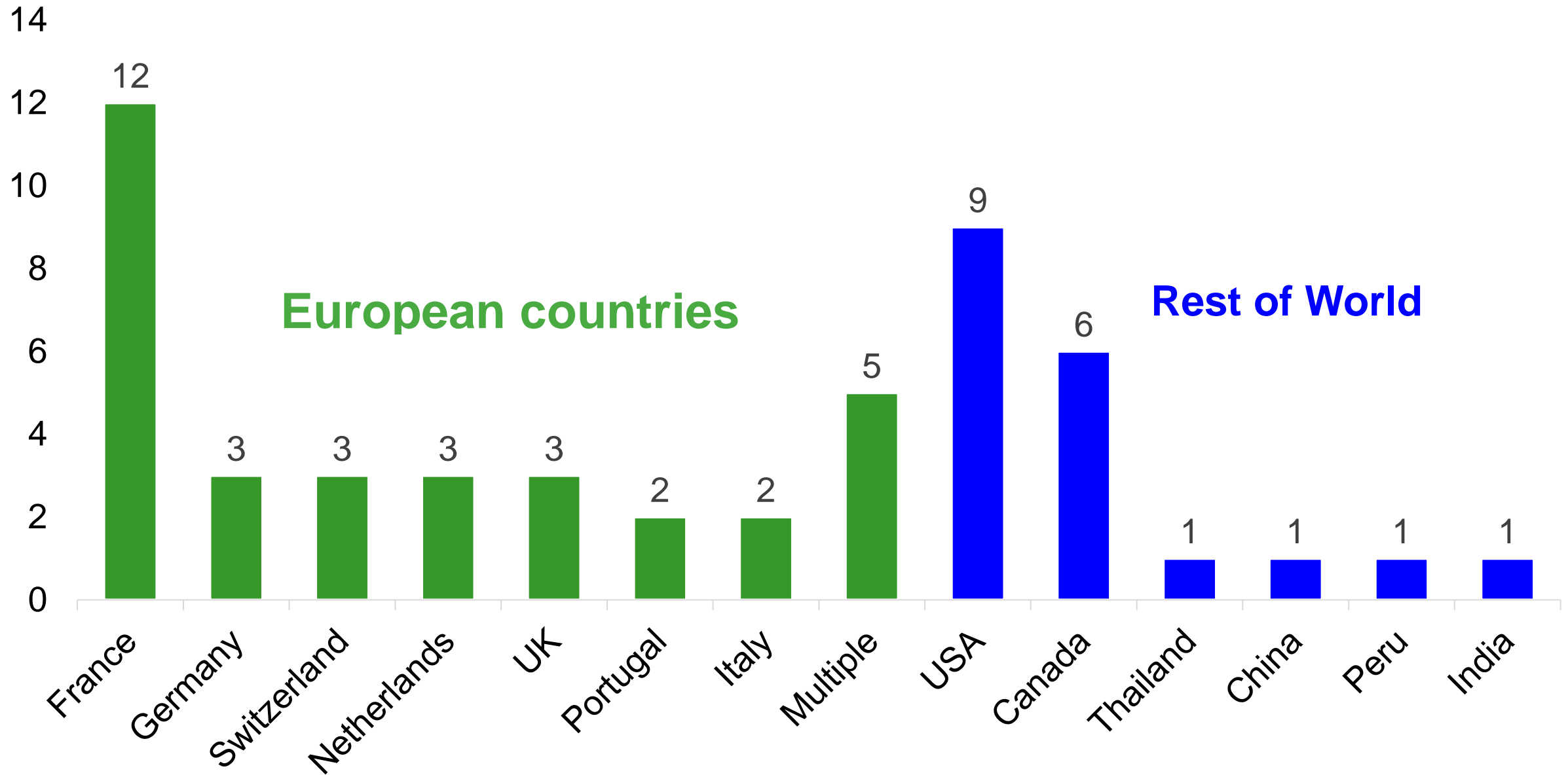
- Extensive initial search conducted.
- The sources had to quantify an impact of pesticide reduction on:
 - Crop yield, or
 - Crop income, or
 - Environmental/social sustainability



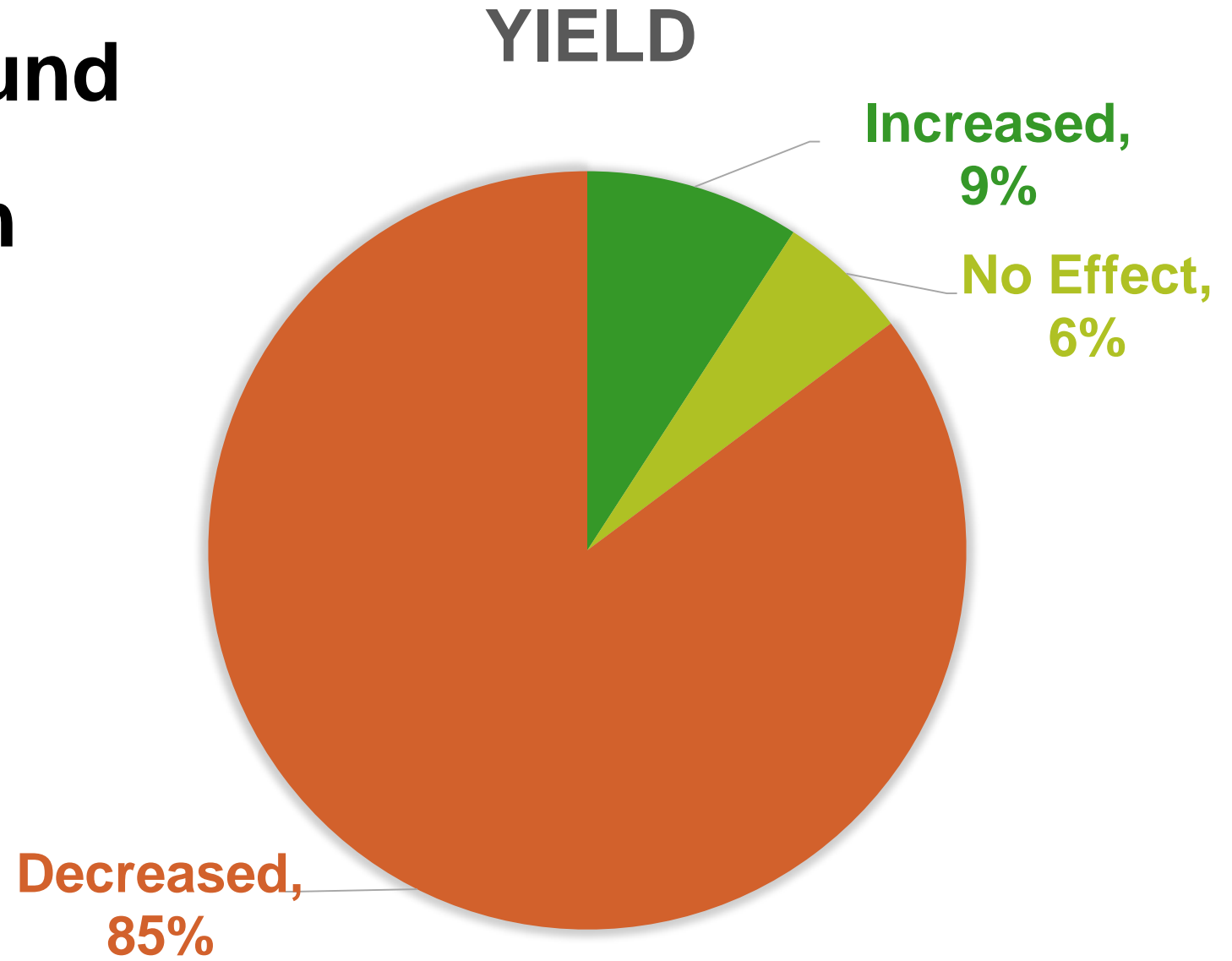
Large variation in crop types



Large variation in location



**Majority of results found
yield to decrease with
pesticide reduction**

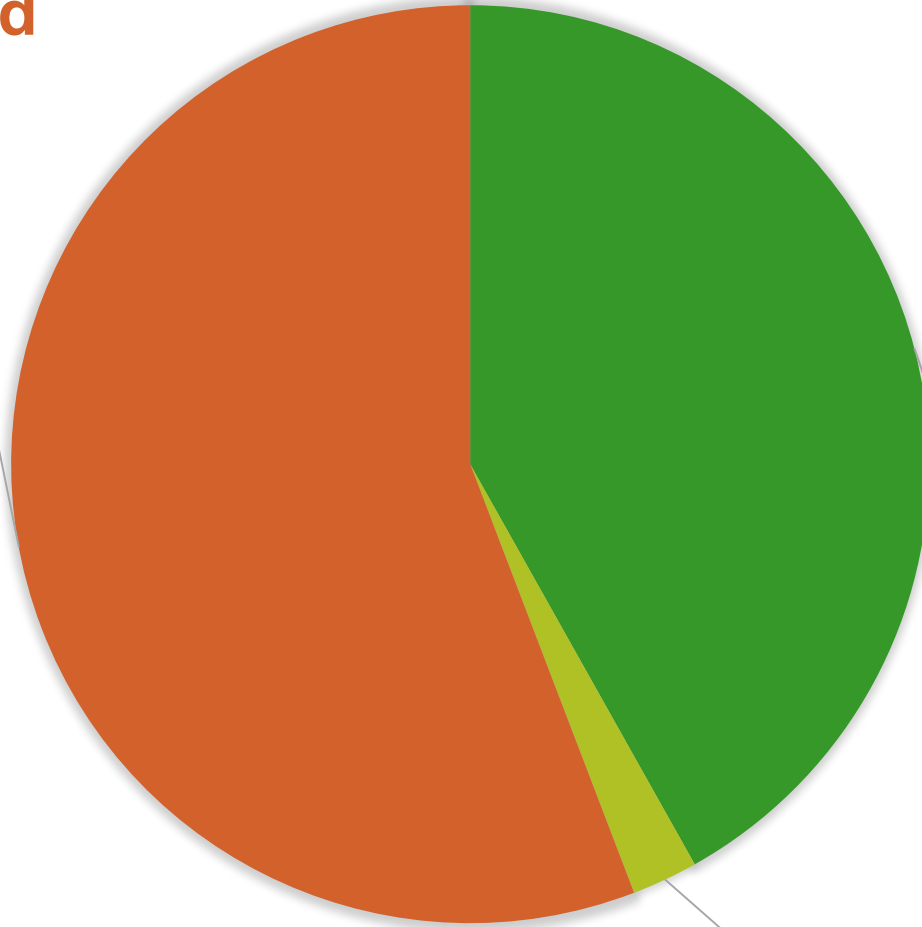


*142 data points from 45 studies

INCOME

**Majority of results
found income to
decrease with
pesticide
reduction**

**Decreased
56%**

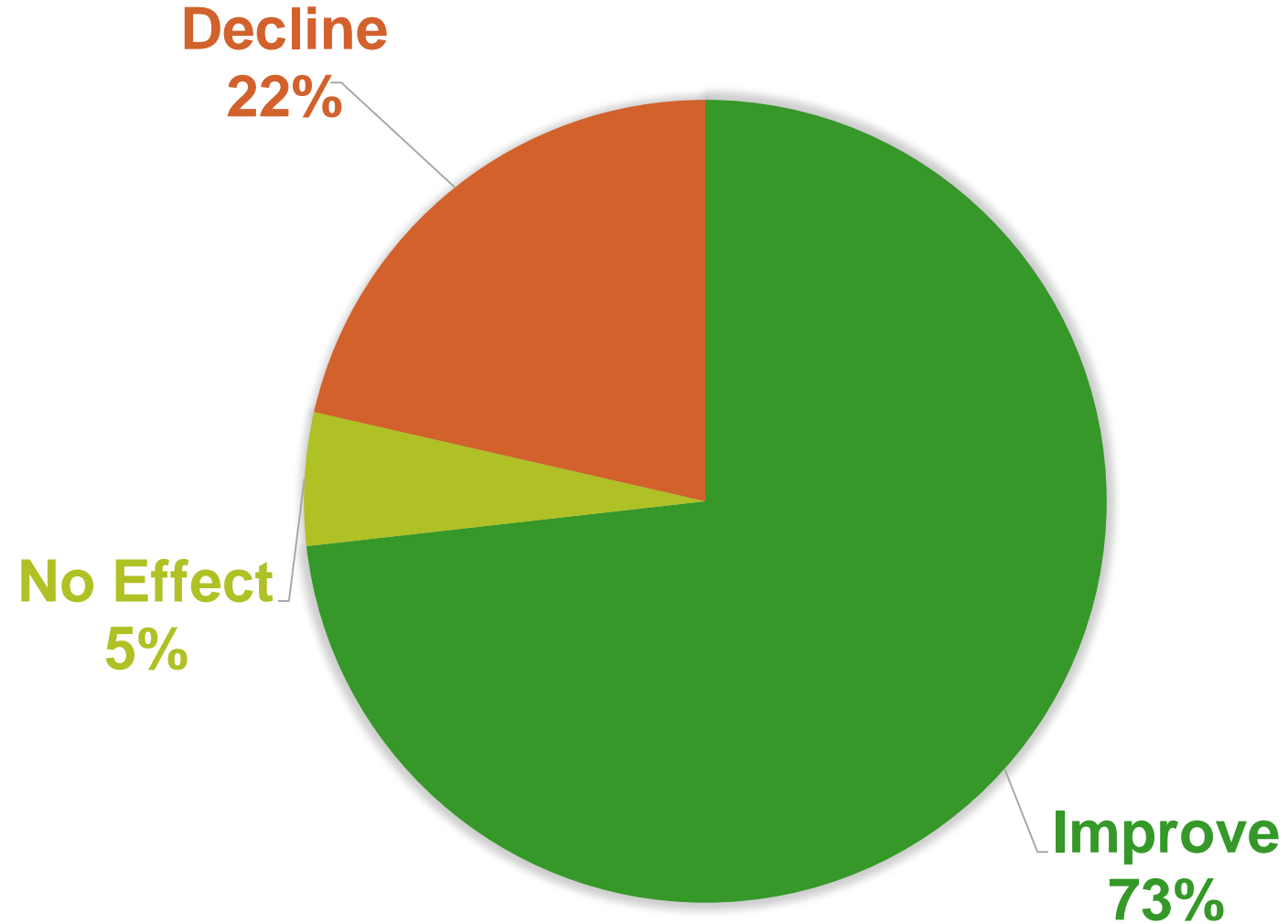


**Increased
42%**

**No Effect
2%**

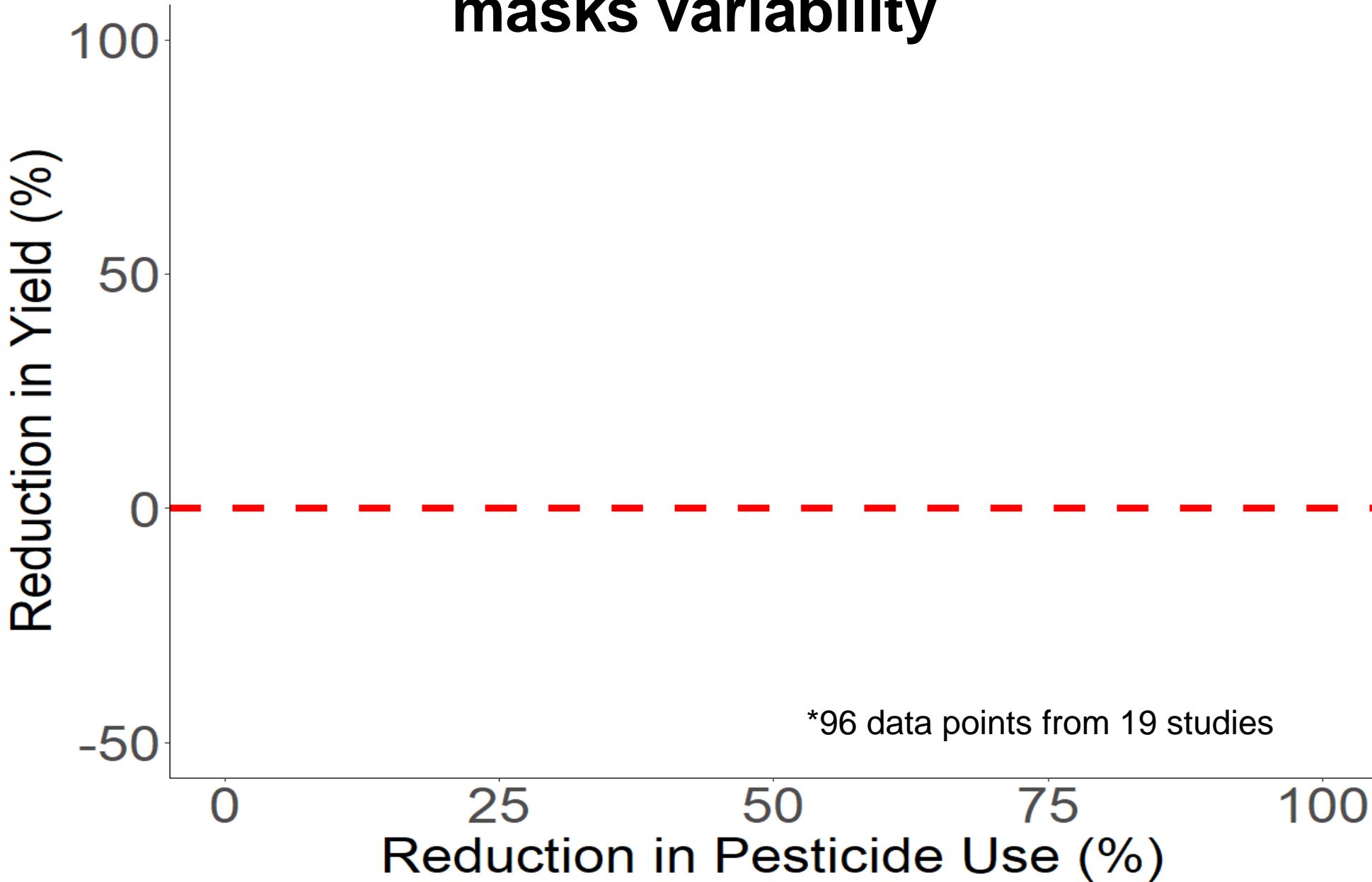
**Majority of results
found socio-
environmental
concerns to
improve with
pesticide reduction**

SOCIO-ENVIRONMENTAL

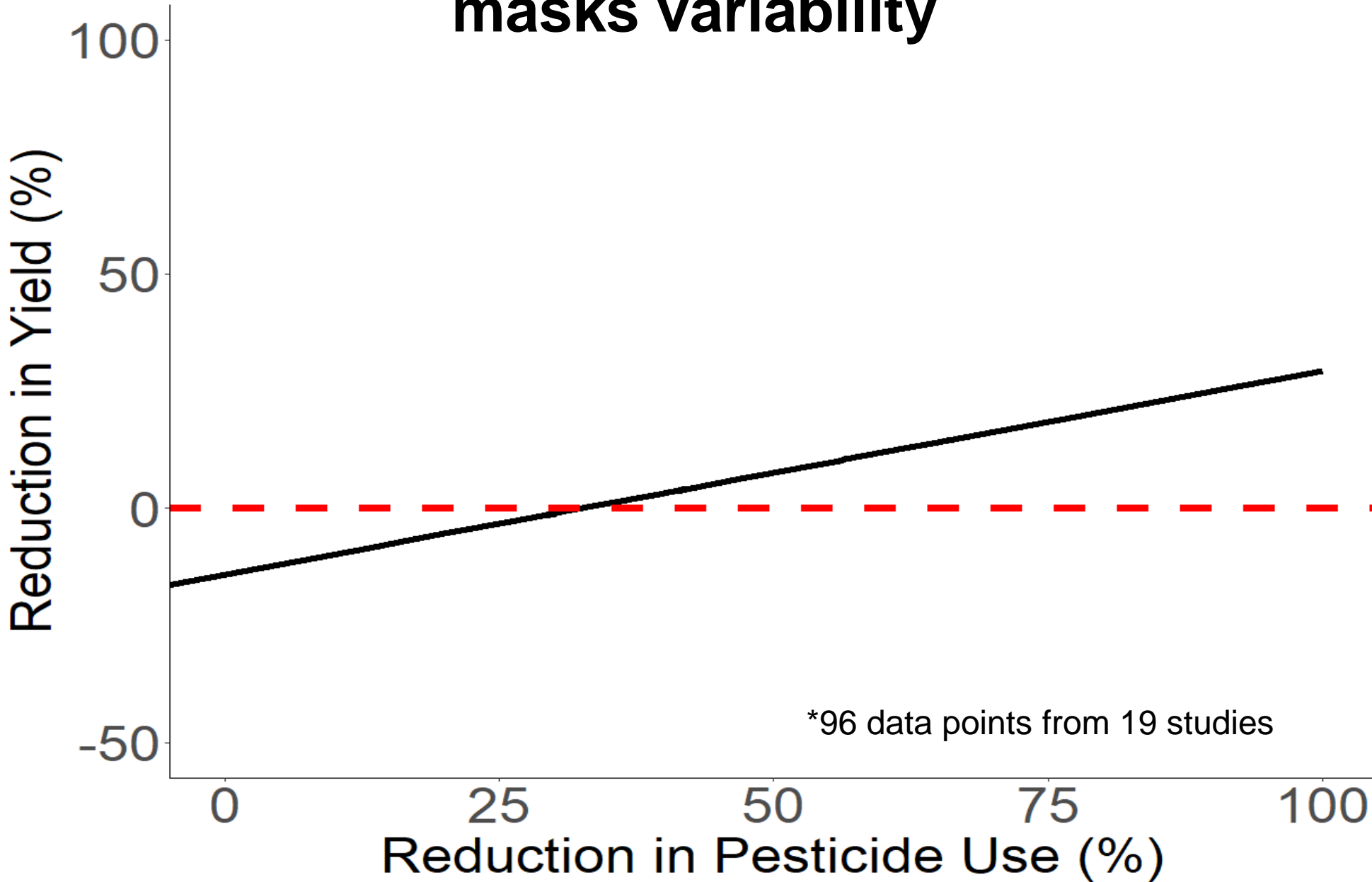


*56 data points from 28 studies

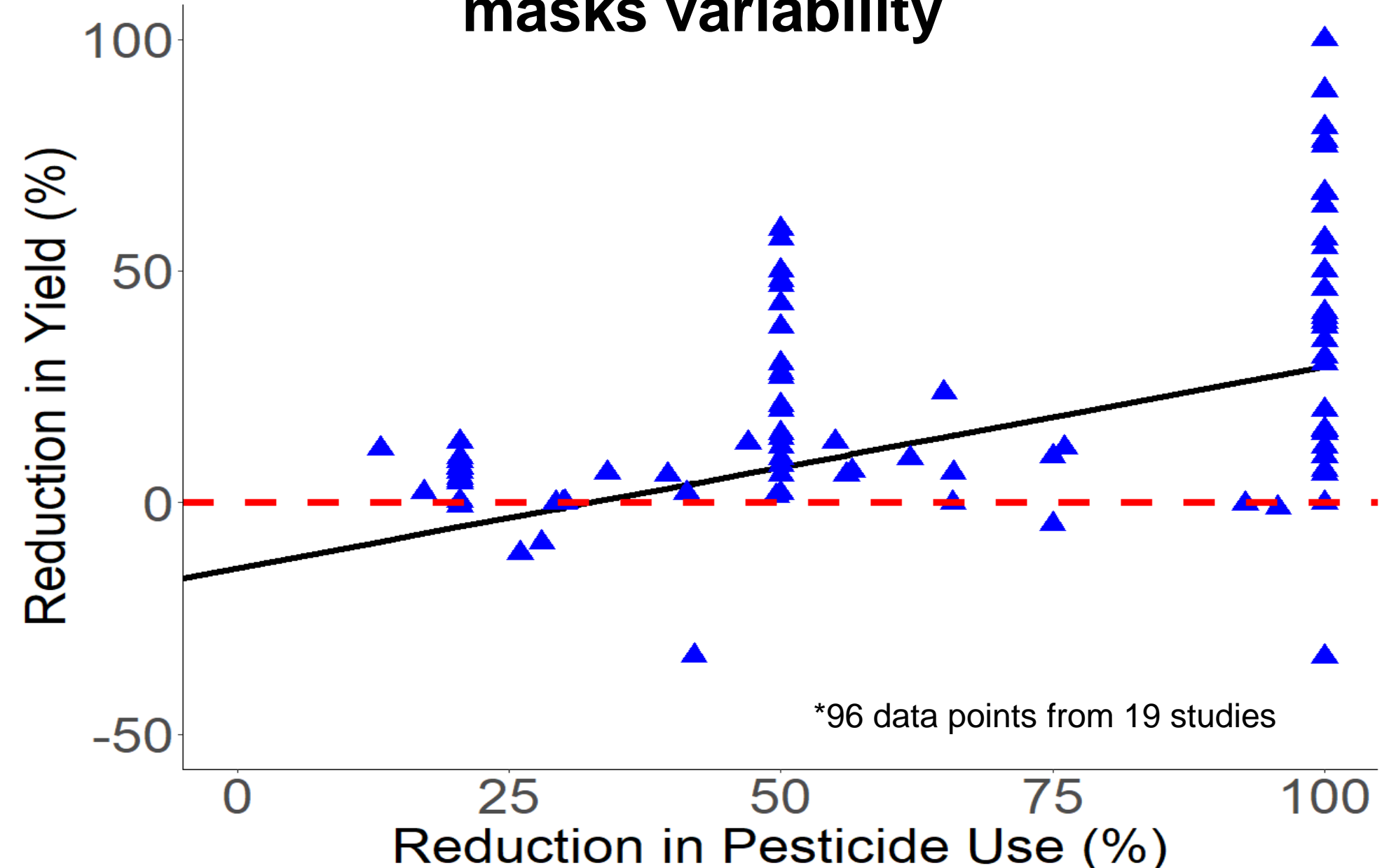
As pesticide use reduces, yield reduces, but study average masks variability



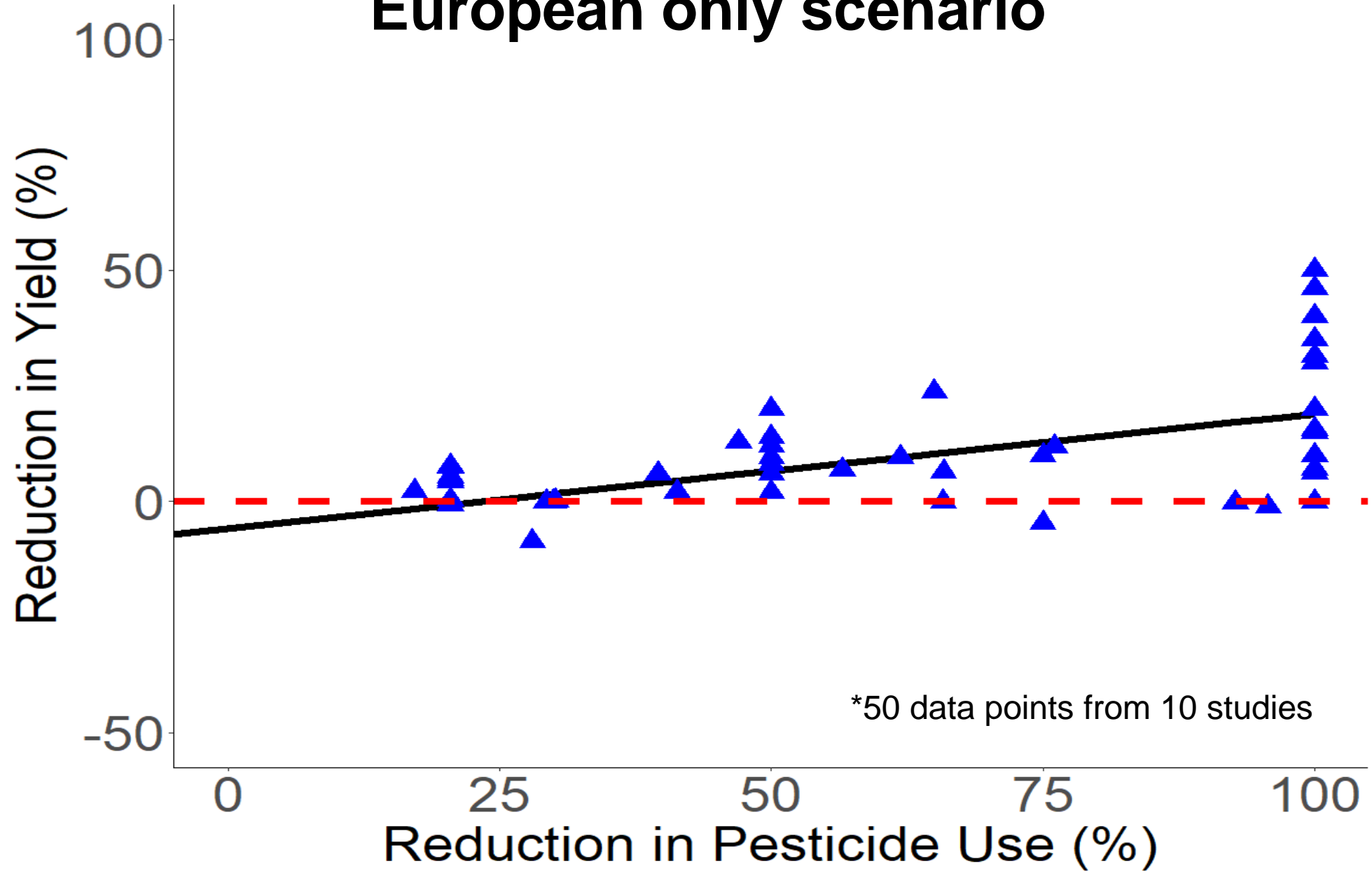
As pesticide use reduces, yield reduces, but study average masks variability



As pesticide use reduces, yield reduces, but study average masks variability



Negative trend and large variability remain in a European only scenario



Take home message

- Variation between studies makes 'average' data unreliable as an indicator for impact estimates
- Yield decline trends with reduced pesticide use, but needs case-by-case investigation
- Region- and crop-specific research is essential to assess impacts on Irish tillage systems

