

Sustainable Intensification:
Recovering the Momentum

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Defra's Sustainable Intensification Research Platform (SIP) 2014-18

- **Four questions covered in this talk:**
- What is SI?
- What was SIP?
- What did it achieve?
- Why does it matter?

Q 1. Sustainable Intensification

- to increase food production from existing farmland while minimising pressure on the environment. It is a response to the challenges of increasing demand for food from a growing global population, in a world where land, water, energy and other inputs are in short supply, overexploited and used unsustainably.
- Any efforts to ‘intensify’ food production must be matched by a concerted focus on making it ‘sustainable.’ Failing to do so will undermine our capacity to continue producing food in the future.

4 visions of SI:

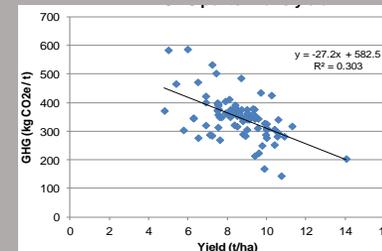


- Agronomic efficiency
- **Focus on: *closing yield gaps through nutrient and water management, precision farming, selective breeding, etc.***
- Agronomic sustainability
- **Focus on: *wider aspects of land management and local Ecosystem Services.***
- Global efficiency
- **Focus on: *land sparing.***
- Global sustainability
- **Focus on: *nutrition and diet, global Food Security and global Ecosystem Services.***

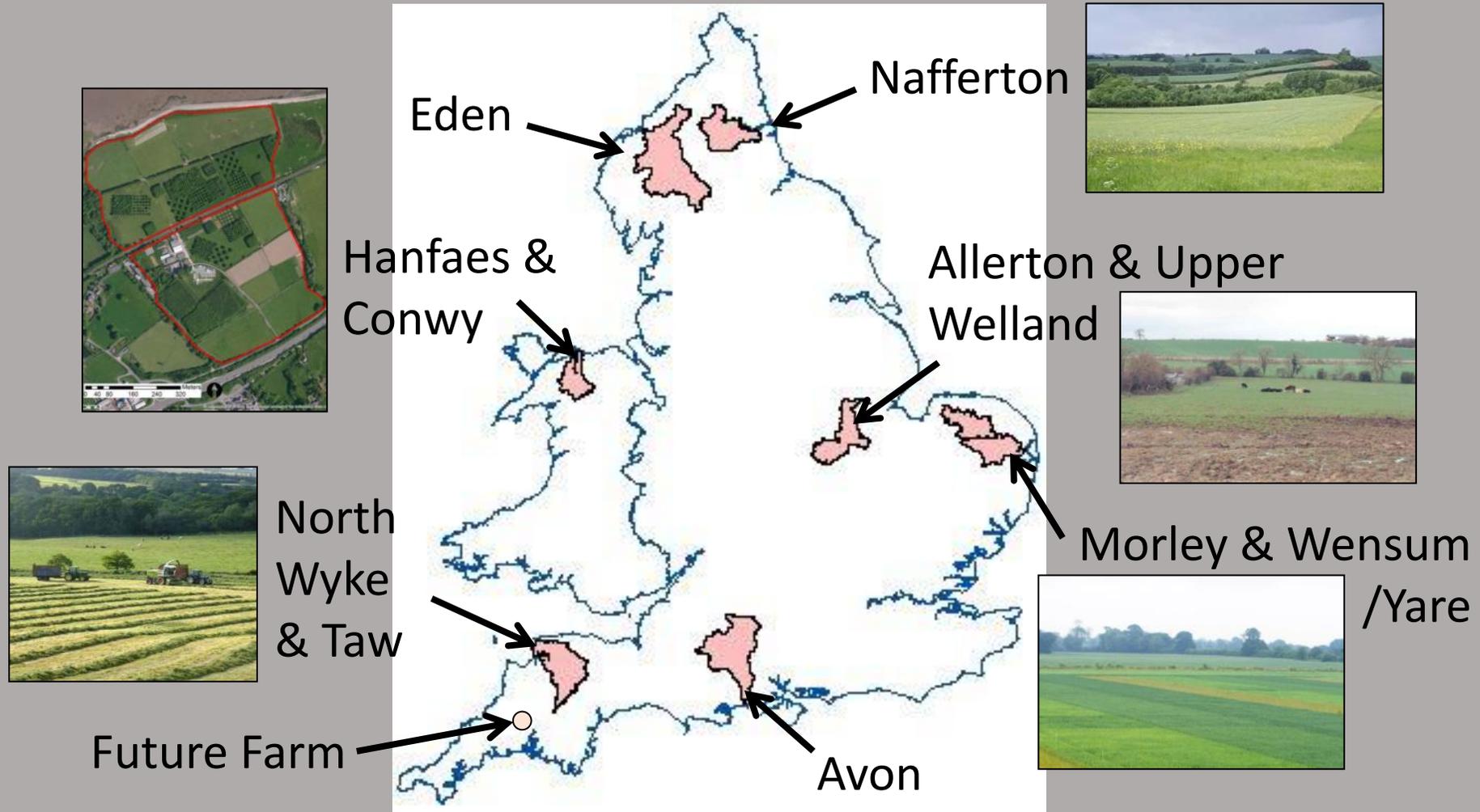
- Gunton, R.M. Firbank, L.G. Inman, A. and Winter, D.M. (2016) How scalable is sustainable intensification, *Nature Plants*, 4 MAY 2016 | ARTICLE NUMBER: 16065 | DOI: 10.1038/NPLANTS.2016.65

Q 2. SIP:

- £4.5M Defra investment over 4 years
- Three linked research projects:
 - Farm Scale (led by NIAB)
 - Landscape Scale (led by Exeter)
 - Supply Chain (led by ADAS)
- Multidisciplinary (natural and social sciences, economics)



SIP Study Farm and Area Locations



Highest ranking potential interventions to deliver sustainable intensification, according to a SIP Workshop.

1. Grow crop varieties with increased tolerance to stress
2. Reduce tillage to minimum or no till
3. Incorporate cover crops, green manures and other sources of organic matter to improve soil structure
4. Improve animal nutrition to optimise productivity (and quality) and reduce the environmental footprint of livestock systems
5. Reseed pasture for improved sward nutrient value and / or diversity
6. Predict disease and pest outbreaks using weather and satellite data, and use this information to optimise inputs

- 7. Adopt precision farming: using the latest technology (e.g. GPS) to target delivery of inputs (water, seeds, pesticides, fertilisers, livestock manures)**
- 8. Monitor and control on-farm energy use**
- 9. Optimise the use of agriculturally marginal land to promote ecosystem services and support biodiversity**
- 10. Provide training for farm staff on how to improve sustainability / environmental performance without compromising yields**

Q3. What did SIP achieve?

- *Lots of data, lots of deliberation.*
- **SI metrics** developed to use in an **SI Benchmarking** site for farmers, and advisors to benchmark SI performance.
- SI indicators used to assess the **economic and environmental performance of commercial farms.**
- An interactive **Landscape Typology Tool** to enable stakeholders to prioritise SI outcomes and strategies in land-use decision making.
- A survey of **famer collaboration.**
- *But very little carried forward or up-dated.*

Q 4. Why does it matter?

- Productivity matters because broadacre farming remains crucial to feeding the nation.
- The 'yield gap' remains, as does highly varied farm performance.
- Underlying global food security is no less precarious than it was ten years ago.
- We cannot divert large areas to nature recovery, carbon storage, energy, etc, and *ignore* food.



The agro-ecology counter-narrative

- Agro-ecology, usually organic systems, certainly has a place but the idea that agro-ecology can rapidly replace mainstream agriculture is misplaced.
- Reports that argue for a rapid transition to agro-ecology are based on heroic assumptions about reducing food waste and radically changed diets.
- Why? Because agro-ecological systems are based on lower yields.
- SI is important because we need to maintain and improve yields *and* deliver environmental outcomes.