Department for Environment Food & Rural Affairs

NFU SRUC ADAS

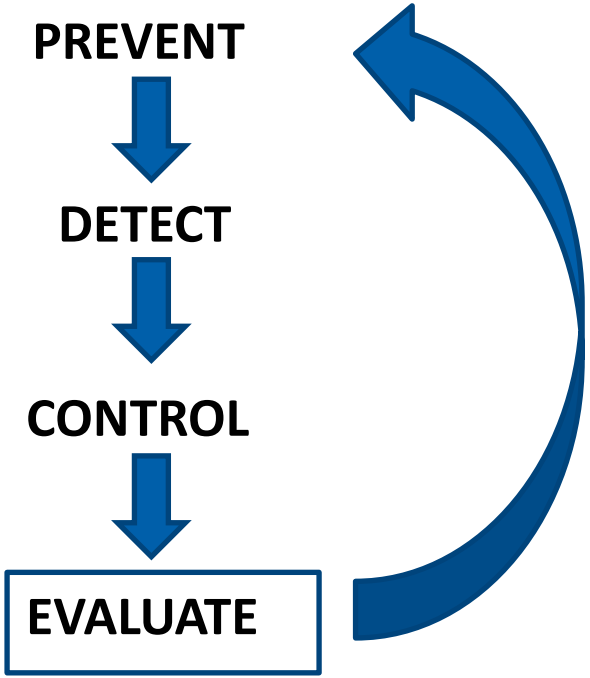
Barriers and Enablers to IPM Adoption

- The Voluntary Initiative – Promoting responsible pesticide use — IPM assessment plans
- ELM IPM T&T project

Dr Henry Creissen *SRUC*

Holly Clarkson *ADAS*

Integrated Pest Management process



VI IPM assessment plans

- Tool to facilitate discussion between farmer and agronomist
- Data collection
  - Baselines
    - IPM score (0-100)
  - Identify issues/topics
  - Direct R&D + KTE

The Voluntary Initiative

Promoting responsible pesticide use

NFU the voice of British farming

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Time to fill in your integrated pest management plan

Pest Management Science SCI

Research Article

Measuring the unmeasurable? A method to quantify adoption of integrated pest management practices in temperate arable farming systems

Plant Health Centre

Scotland's Centre of Expertise

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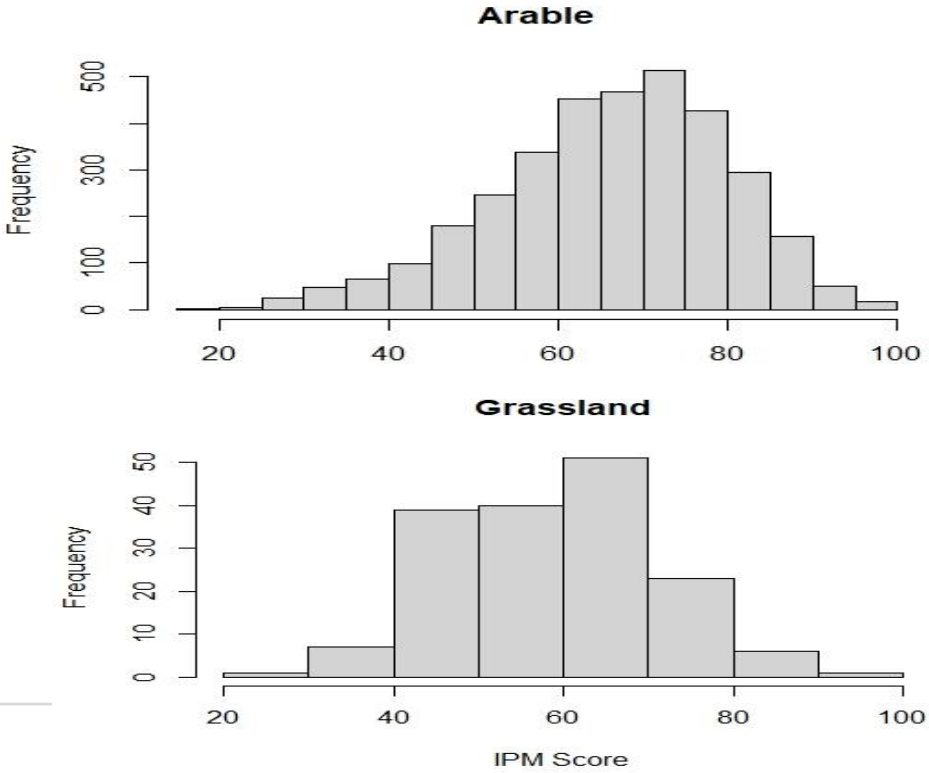
Scottish IPM Assessment Plan

IPM scoring system

Q*	Question	Final weights (%)
3	What proportion of land on your farm is in continuous cereals production?	11.46
4	Why do you typically use an arable rotation?	11.78
5	What influences your choice of crop variety?	8.77
8	What preventative measures are used to control weeds, diseases & insects etc.	46.93
9	What factors do you consider when deciding on your pest management plan?	15.24
14	Membership of an agronomy / crop discussion group?	5.82
	Total	100

Creissen et al. 2019 *Pest Man.Sci.* **75**

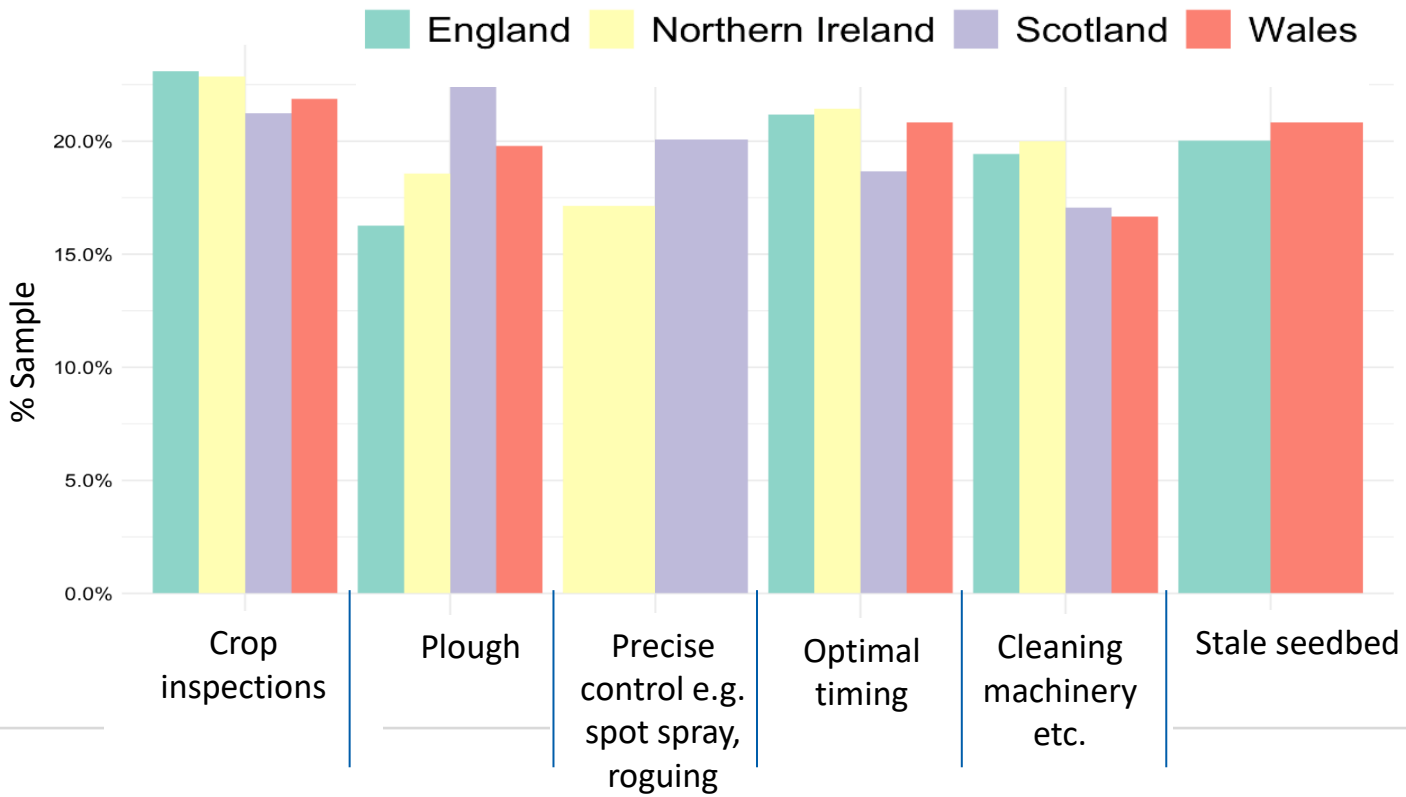
VI IPM plans: Distribution of IPM scores



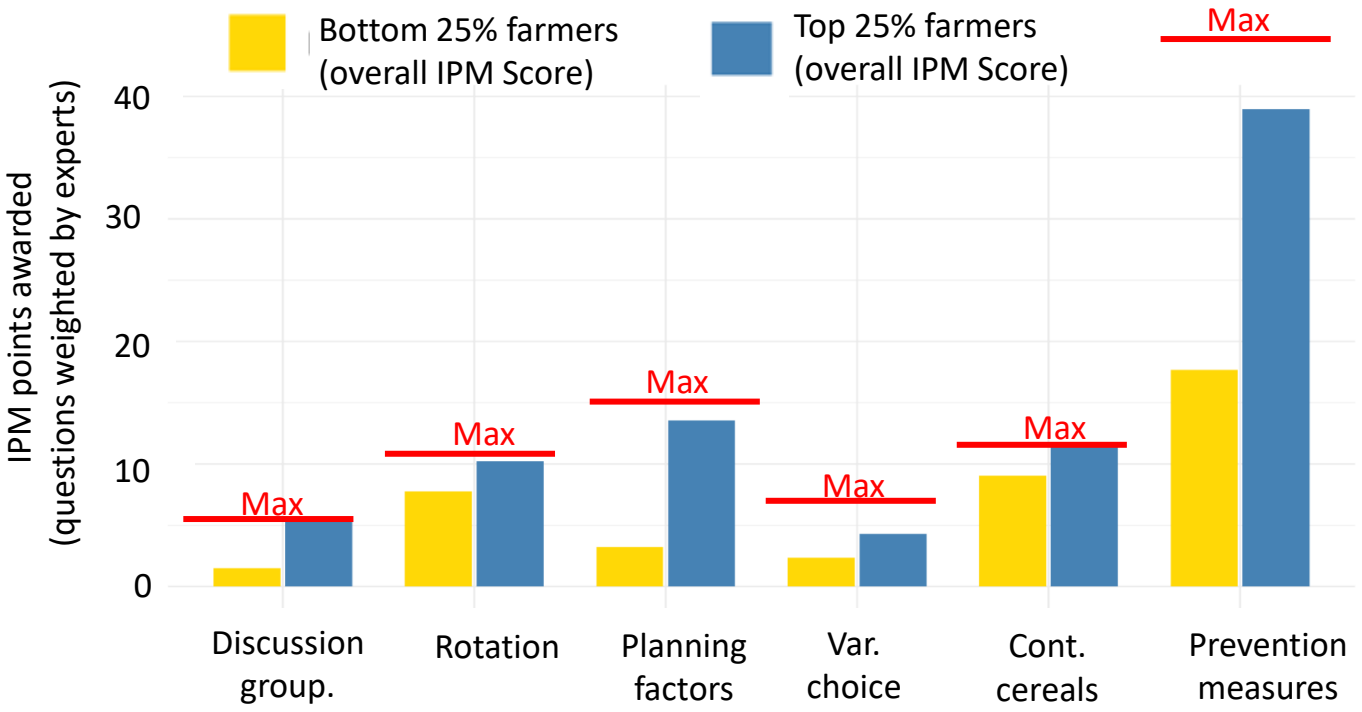
2021
Arable=3381
Grassland=168

	Arable	Grassland
Min	19.8	25.26
1st Quart	57.93	48.6
Median	67.73	59.67
Mean	**66.31**	**58.78**
3rd Quart	75.97	66.57
Max	97.57	94.18

Preventing the introduction and spread of weeds



IPM activities: High/low adopters



VI IPM assessment plans

- High adopters:
  - More preventative measures
  - Consider more factors when IPM planning
  - Actively seek IPM knowledge
- IPM advice: clear, consistent, evidence-based
  - Role of agronomist
- IPM adoption responsibility of all
- Continually developing sector specific plans
  - Broad acre crop
  - Grassland
  - Specialist horticulture (coming soon)

Tool to facilitate discussion => IPM action plan

ELMs Test and Trials

- **Land Management Plan** - what would be included in a plan, how long it should be and what information is needed to support the land manager or farmer
- **Role of Advice and Guidance** - the level and role of advice and guidance that land managers and farmers would need to put together a plan
- **Spatial prioritisation** - to test mechanisms to identify and agree local priorities
- **Collaboration** - to test how different mechanisms of collaboration would work to deliver environmental outcomes
- **Payments** - to test different approaches to valuing environmental outcomes and how these might work in practice
- **Innovative delivery mechanisms** - how these could be rolled out more widely and in what circumstances. For example, trialling payment by results and reverse auctions

Agri-environment schemes

Environmental land management schemes

We are introducing three new schemes that reward environmental benefits: the Sustainable Farming Incentive, the Local Nature Recovery schemes and the Landscape Recovery scheme.

Together, these schemes are intended to provide a powerful vehicle for achieving the goals of the 25 Year Environment Plan and our commitment to net zero emissions by 2050, while supporting our rural economy.

Through these schemes, farmers and other land managers may enter into agreements to be paid for delivering the following public goods:

- Clean and plentiful water
- Clean air
- Thriving plants and wildlife
- Reduction in and protection from environmental hazards
- Adaptation to and mitigation of climate change
- Beauty, heritage and engagement with the environment.

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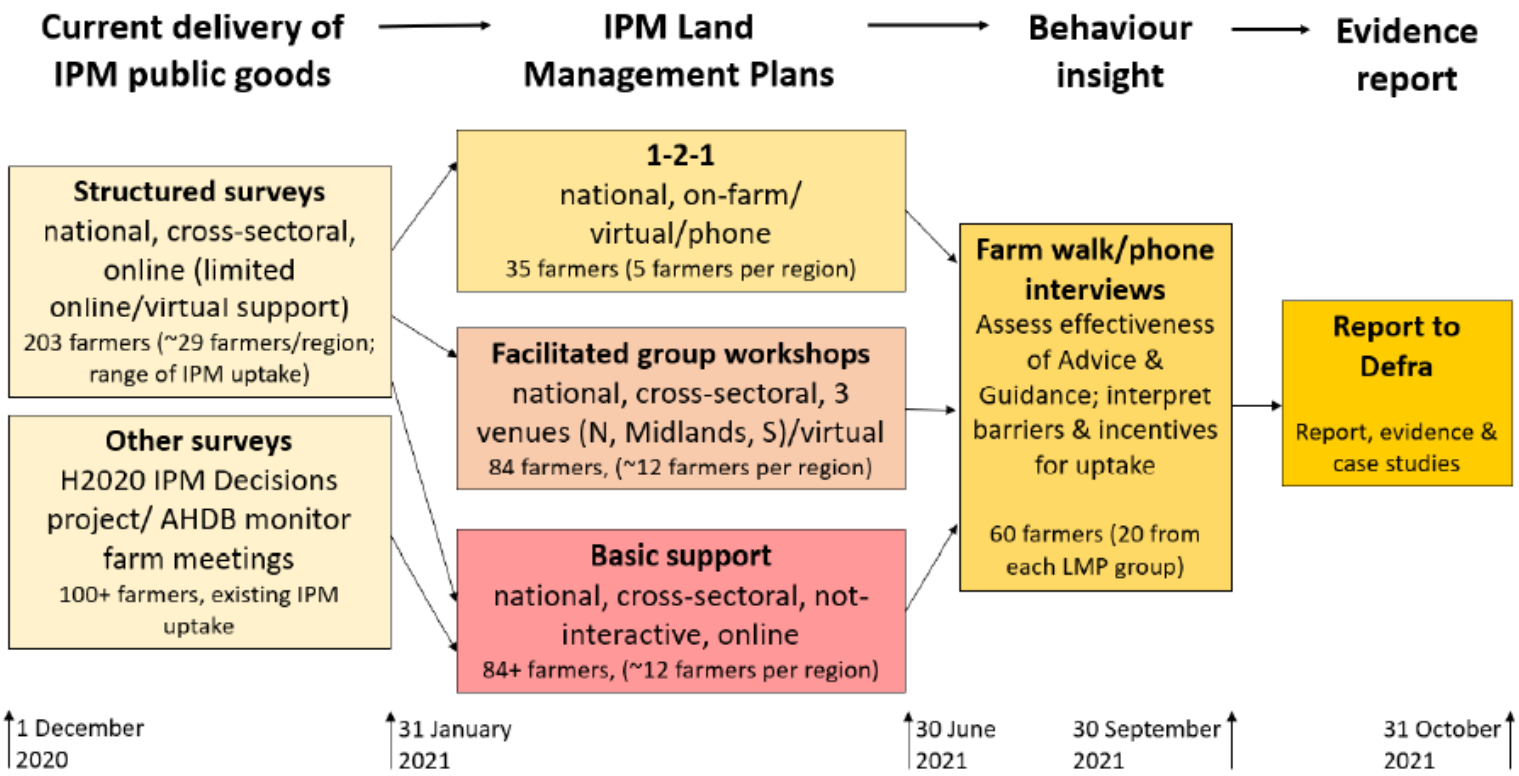
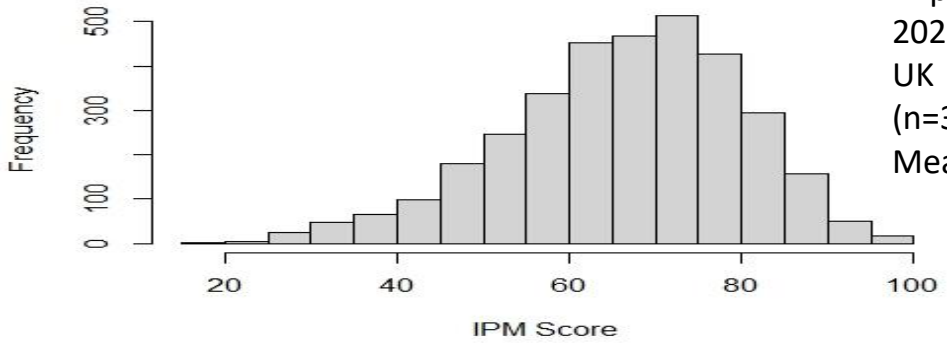
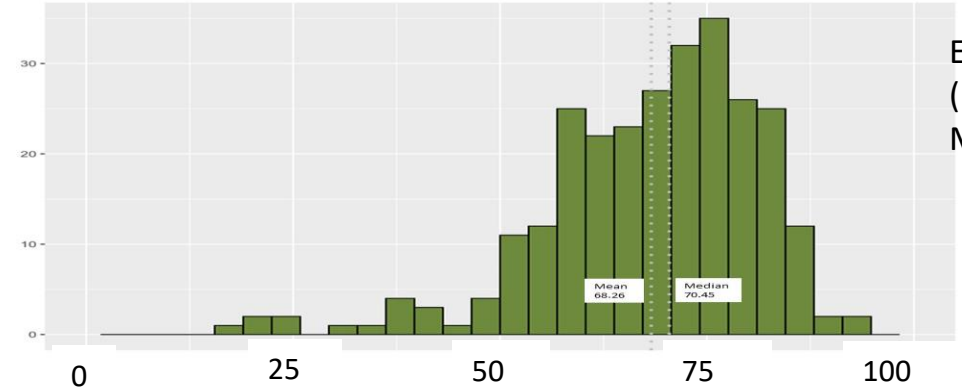
ELM IPM Test and Trial



ELM T&T: Identifying participants via VI IPM plan



VI plans
2021
UK
(n=3381)
Mean 66.3



ELM Test and trial
(n=274)
Mean 68.2

Crop specific IPM tool for crops representing sector:

- Horticulture: Potatoes
- Grassland: Grass
- Arable: Wheat

O87

Weed Issues

For weed identification please visit https://ahdb.org.uk/knowledge-library/the-encyclopaedia-of-arable-weeds

Perennial grasses	Annual grasses	BLW - tap root	BLW - fibrous root

For weed management guidance please visit https://ahdb.org.uk/arableweeds

			No Issue	Significant Issue	Slight Issue	Moderate Issue	Links to Guidance
Control Measure	Rotation/ Other	Cover crops	?	Not Used	Not Used	Not Used	https://ahdb.org.uk/cover-crops
		Crop mixtures/companion planting		Not Used	Not Used	Not Used	
		Fallow	?	Short Term	Short Term	Short Term	
		Grass / Herbal Leys	?	Short Term	Short Term	Short Term	
		Improving drainage	?	In Use	In Use	In Use	https://ahdb.org.uk/drainage
		Rotation	?	In Use	In Use	In Use	
		Spring sowing	?	In Use	In Use	In Use	
	Crop Establishment	Stubble cultivations	?	In Use	In Use	In Use	https://ahdb.org.uk/arablesoils
		Primary cultivations	?	In Use	In Use	In Use	
		Secondary cultivations	?	In Use	In Use	In Use	
		Delayed drilling/stale seedbeds	?	In Use	In Use	In Use	
		High plant densities / increasing seed rates	?	In Use	In Use	In Use	
	Crop Management	Precision application	?	Short Term	Short Term	Short Term	
		Hand rougueing	?	In Use	In Use		
		Harrow / tine weeders (broad spectrum)	?	Not suitable	Not suitable	Not suitable	
		Inter row hoeing		Not Used	Not suitable	Not suitable	
		Weed surfing	?	?	?	?	
		Spot and patch spraying	?	In Use	In Use	In Use	

Resistance Assessment	Do you suspect resistance to plant protection products used to control this issue?	No	Yes	No	No
	Have you checked with WRAG if resistance has been reported in the UK? https://ahdb.org.uk/wrag		Yes		
	Has Resistance been found?		No		
	Have you implemented a resistance management strategy?				

ELM T&T: Behavioural Insights Interviews

Behavioural insights interviews were conducted with three main aims:

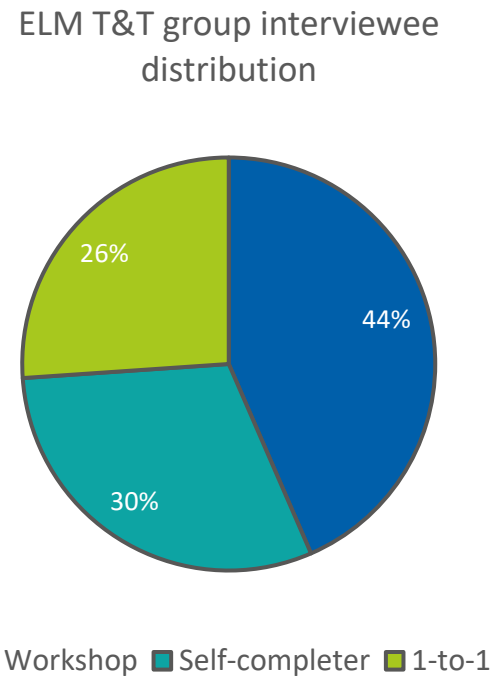
1. To understand the **key drivers** behind the uptake of IPM advice and/or guidance
2. To understand the **impact of participation** in this ELM T&T on the uptake of IPM advice and/or guidance
3. To understand **key enablers and barriers** to the uptake of IPM advice and/or guidance

Interviews compromised 4 sections to address these aims:

- ‘You and Your Farm’
- ‘Advice and Guidance’
- ‘Uptake of IPM’
- ‘Enablers and Barriers to IPM Uptake’

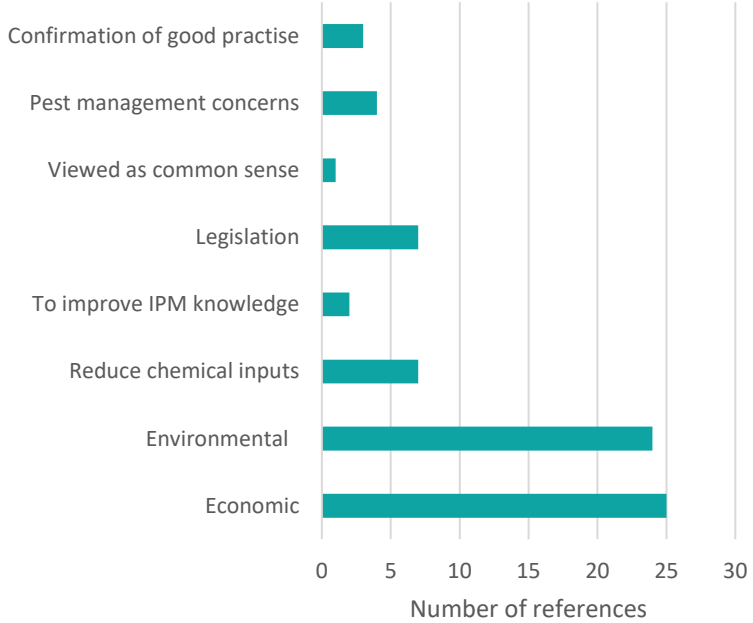
ELM T&T: Behavioural Insight Interviews

- Total of 46 completed interviews with UK farmers who completed crop specific IPM LMP plan
- In-depth thematic coding and analysis provided behavioural insights addressing the three main aims
- Cross-tabulation of interviewee responses by ELM T&T groups to identify differences
  - ➢ Fairly even spread across the three IPM assessment groups



ELM T&T: Behavioural Insight Interviews

Key drivers affecting uptake of IPM advice and/or guidance:



Drivers affecting the uptake of IPM advice and/or guidance	Self-completer (N=14)	1-to-1 (N=12)	Workshop (N=20)	**Total references across all groups (N=46)**
Economic	64%	58%	45%	**54%**
Environmental	57%	42%	55%	**52%**
Legislation	7%	33%	10%	**15%**
Reducing chemical inputs	14%	8%	20%	**15%**
Pest management concerns	7%	0%	15%	**9%**
Confirmation of good practise	0%	0%	15%	**7%**
To improve IPM knowledge	0%	8%	5%	**4%**
Viewed as common sense	7%	0%	0%	**2%**
Total 'drivers affecting uptake' responses	**86%**	**92%**	**95%**	**91%**

ELM T&T: Behavioural Insight Interviews

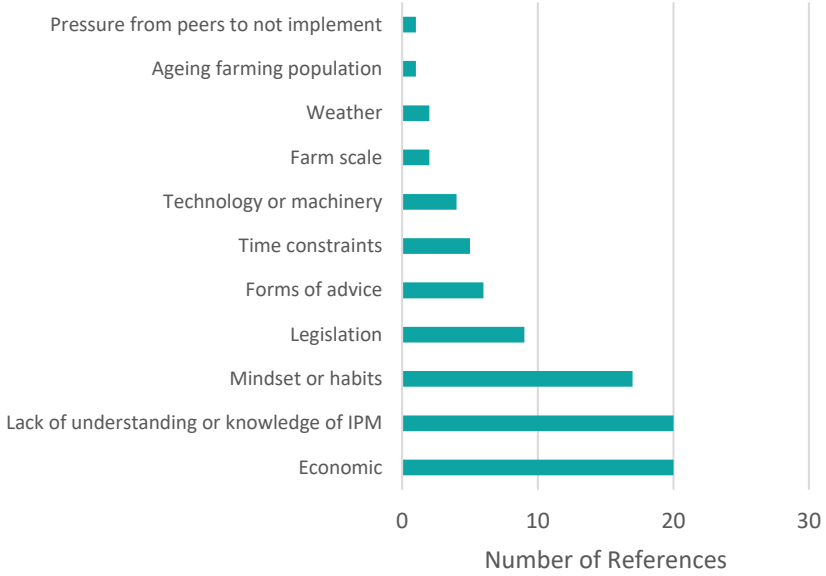
Impact of participation in the T&T on uptake of IPM advice and/or guidance:

View on IPM	Self-completer (N=14)	1-to-1 (N=12)	Workshop (N=20)	**Total references across all groups (N=46)**
Already had good understanding	86%	33%	70%	**65%**
View on IPM changed	0%	17%	25%	**15%**
Not heard of IPM before	14%	17%	0%	**9%**
Didn't know that IPM practises had the 'IPM' label	0%	0%	5%	**2%**
Total 'view on IPM' responses	**100%**	**67%**	**85%**	**85%**

Usefulness of IPM LMP to farm	Self-completer (N=14)	1-to-1 (N=12)	Workshop (N=20)	**Total references across all groups (N=46)**
Useful	50%	25%	50%	**44%**
Nothing new to be gained	14%	17%	10%	**13%**
Just recording what already doing	14%	0%	15%	**11%**
Good for sense checking decision making	0%	0%	10%	**4%**
Could be more in-depth	7%	8%	0%	**4%**
Encourages holistic attitude and thinking about IPM	0%	0%	5%	**2%**
Not as relevant as hoped	0%	8%	0%	**2%**
Not enough guidance	0%	8%	0%	**2%**
Not relevant to current situation	0%	8%	0%	**2%**
Not useful	0%	8%	0%	**2%**
Some advice was common practise	0%	0%	5%	**2%**
1-to-1 discussion more useful than the LMP itself	0%	8%	0%	**2%**
Difficult to say either way	0%	8%	0%	**2%**
Total 'usefulness of IPM LMP' responses	**77%**	**83%**	**85%**	**83%**

ELM T&T: Behavioural Insight Interviews

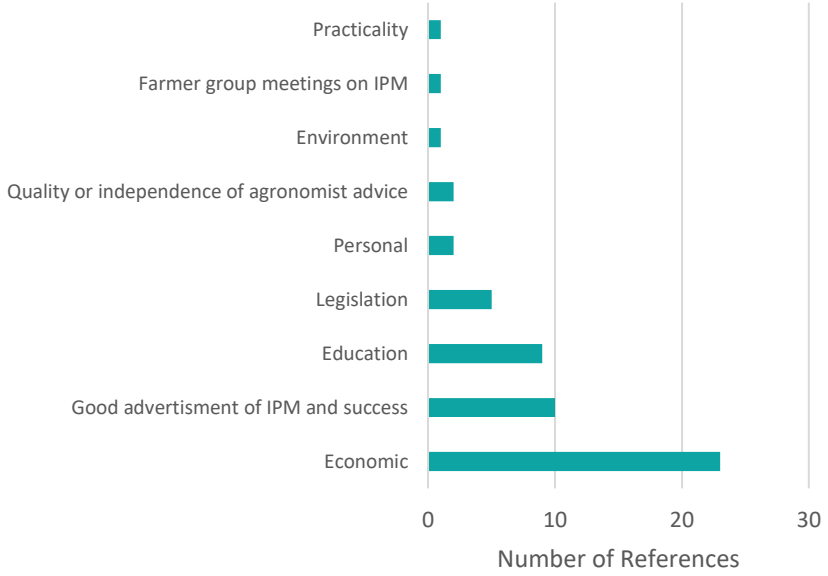
Barriers to uptake of IPM advice and/or guidance:



Barriers to uptake of IPM practises	Self-completer (N=14)	1-to-1 (N=12)	Workshop (N=20)	**Total references across all groups (N=46)**
Economic	43%	42%	45%	**44%**
Lack of understanding or knowledge of IPM	57%	42%	35%	**44%**
Mindset or habits	21%	33%	50%	**37%**
Legislation	14%	42%	10%	**20%**
Forms of advice	7%	8%	20%	**13%**
Time constraints	14%	0%	15%	**11%**
Technology or machinery	0%	8%	15%	**9%**
Farm scale	0%	0%	10%	**4%**
Weather	7%	0%	5%	**4%**
Ageing farming population	0%	0%	5%	**2%**
Pressure from peers to not implement	0%	8%	0%	**2%**
Total 'barriers to uptake' responses	**100%**	**100%**	**95%**	**98%**

ELM T&T: Behavioural Insight Interviews

Biggest encouragement to uptake of IPM:



Biggest encouragement to uptake of IPM practises	Self-completer (N=14)	1-to-1 (N=12)	Workshop (N=20)	**Total references across all groups (N=46)**
Economic	36%	58%	55%	**50%**
Good advertisement of IPM	21%	25%	20%	**22%**
Education	14%	8%	30%	**20%**
Legislation	14%	8%	10%	**11%**
Personal	0%	0%	10%	**4%**
Quality or independence of agronomist advice	0%	0%	10%	**4%**
Environment	7%	0%	0%	**2%**
Farmer group meetings on IPM	0%	0%	5%	**2%**
Practicality	0%	8%	0%	**2%**
Total 'biggest encouragement to uptake of IPM' responses	**71%**	**75%**	**90%**	**80%**

ELM T&T: Behavioural Insight Summary

- Similarities in behaviours and opinions surrounding IPM existed between the three ELM T&T groups
- Approximately half of interviewees felt that the IPM LMP tool was useful
- **'Economic'** and **'environmental'** most cited as drivers to use of IPM advice and/or guidance
- 65% of interviewees stated that they already had a good understanding of IPM before the project
  - 25% of workshop and 17% of 1-to-1 participants stated that their **views were changed** on IPM as a result of the project (0% self-completers)
- Key barriers to uptake of IPM practises were highlighted as **'economic'**, **'lack of knowledge or understanding of IPM'**, and **'mindset or habits'**
- 50% interviewees highlighted **'economic'** factors as being the biggest encouragement to implement IPM practises on-farm, followed by **'good advertisement of IPM'** and **'education'**

ELM T&T: Possible next steps

IPM LMP tool

- Record current implementation and commitments to further implement IPM
- Commitment to increase in IPM: 12-38% for arable crops, 2-21% for grassland
- Test revised & new IPM LMP tools for key crops & pests
- Review of effective IPM methods

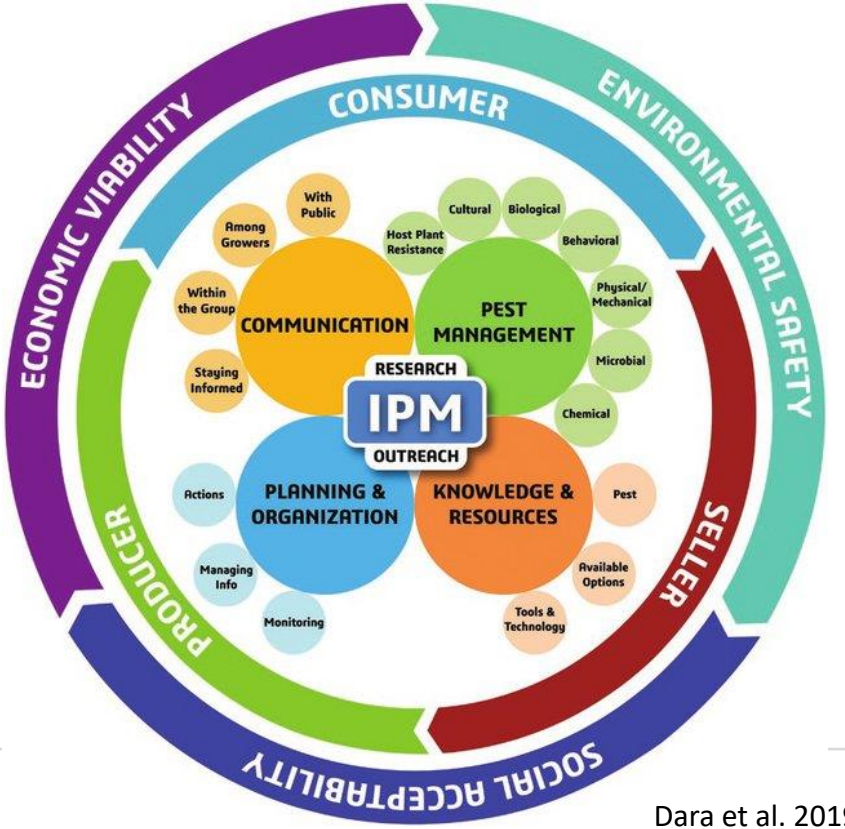
Guidance & support

- Short written guidance + Online video presentations + Technical helpline (to resolve IT issues)

Possible next steps

- Identify how IPM LMPs could operate in conjunction with SFI standards (economic incentives)
- Success of IPM adoption can be quantified by:
  - VI IPM assessment plan + Defra pest and disease survey

Integrated Pest Management



Dara et al. 2019. *J. of IPM* **10**

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VI/NFU IPM assessment plan

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