FARM D Forum for Agricultural Risk Management in Development

Session 4: Climate Change: More Bugs, More Diseases?

Presentation by Julian Smith, FERA, UK

The Food and Environment Research Agency

Climate Change
More Bugs, More Diseases

True or false?

Julian Smith
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A history of big pest events

Shock events drive poverty, manageable pest drive markets

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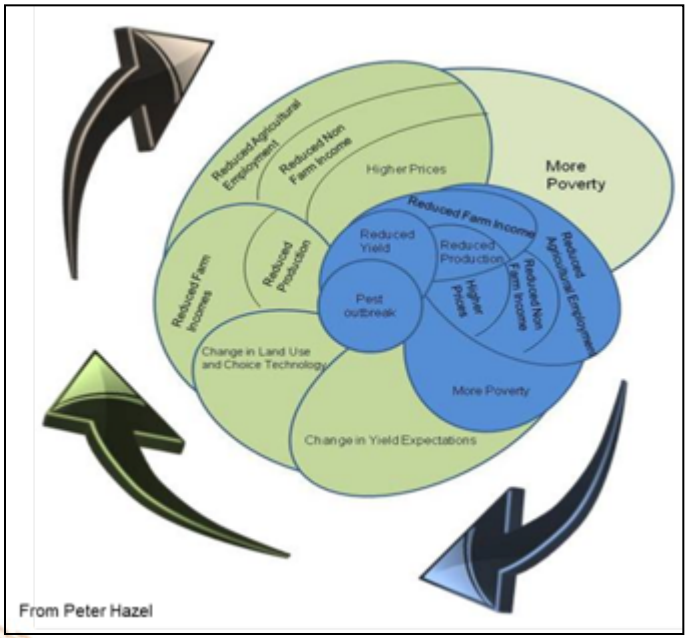

- Cassava Mosaic Disease
- Cassava Brown Streak Disease
- Maize Lethal Necrosis Disease
- Banana Xanthomonas Wilt
- Coconut Lethal Yellowing Disease
- Fusarium Tropical Race 4





An increased risk of future epidemic events

Crop biosecurity, a one-world global challenge

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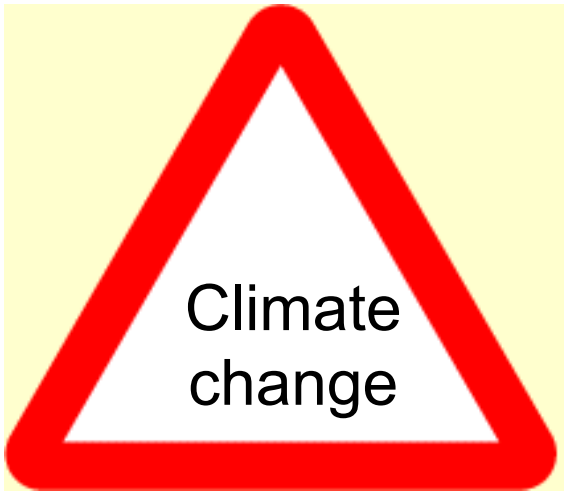

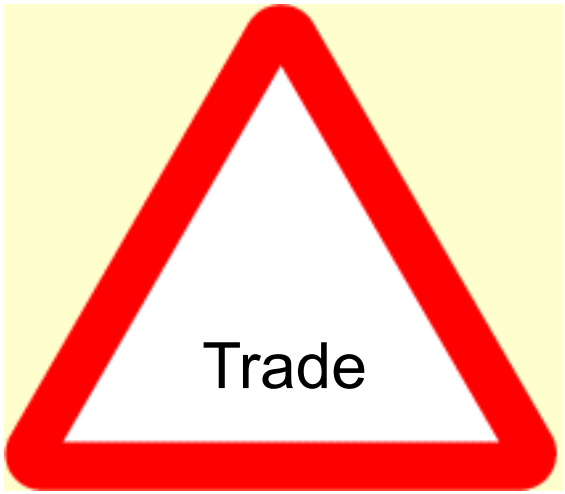

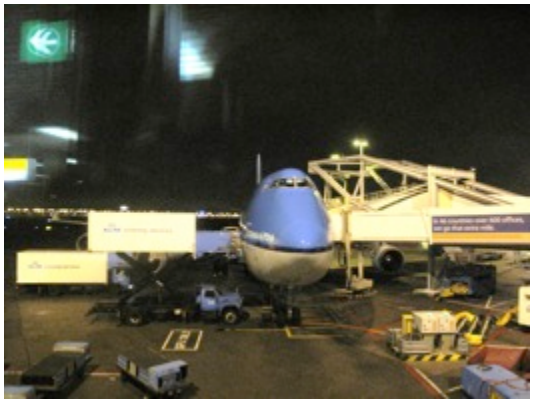

Africa, a failed state in plant health

Prevention is better than cure

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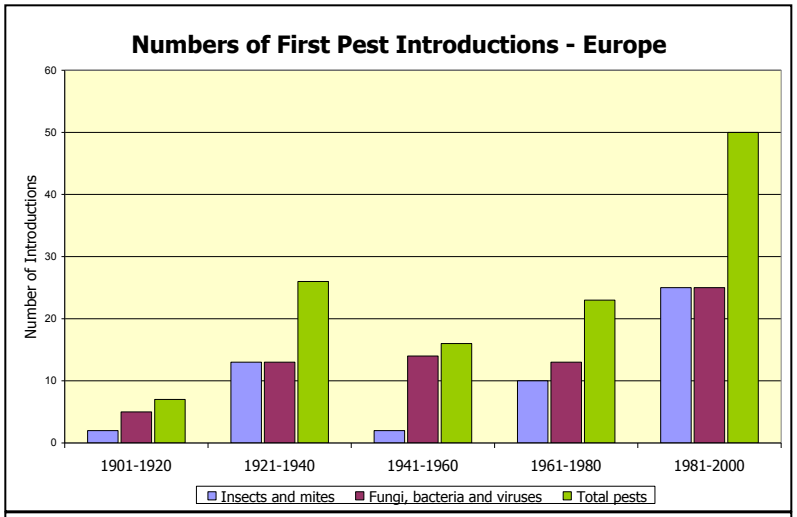

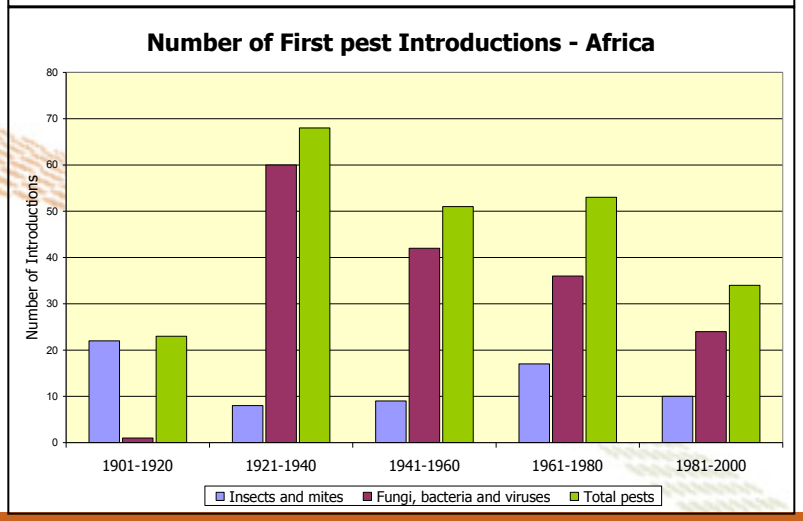

- From the mid-70s there is good evidence of a decline in the rate of new crop pest records for Africa
- It is argued that this is due to a decline in surveillance and capacity in Africa
- Most new crop pest records of Africa continue to be identified outside of Africa

2006: Foresight Infectious Diseases: preparing for the future Action Plan

Maize Lethal Necrosis in East Africa

A new entrant pathogen on the move

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- Kenyan farmers describe a ‘fire’ on Maize (2011)
- Virus complex identified outside of Africa
- MLN reported across 6 countries in just 3 years
- Policy response to MLN is mixed, seed continues to move across borders without testing

What will a change in climate change?

The long and the short-term

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Climate Change

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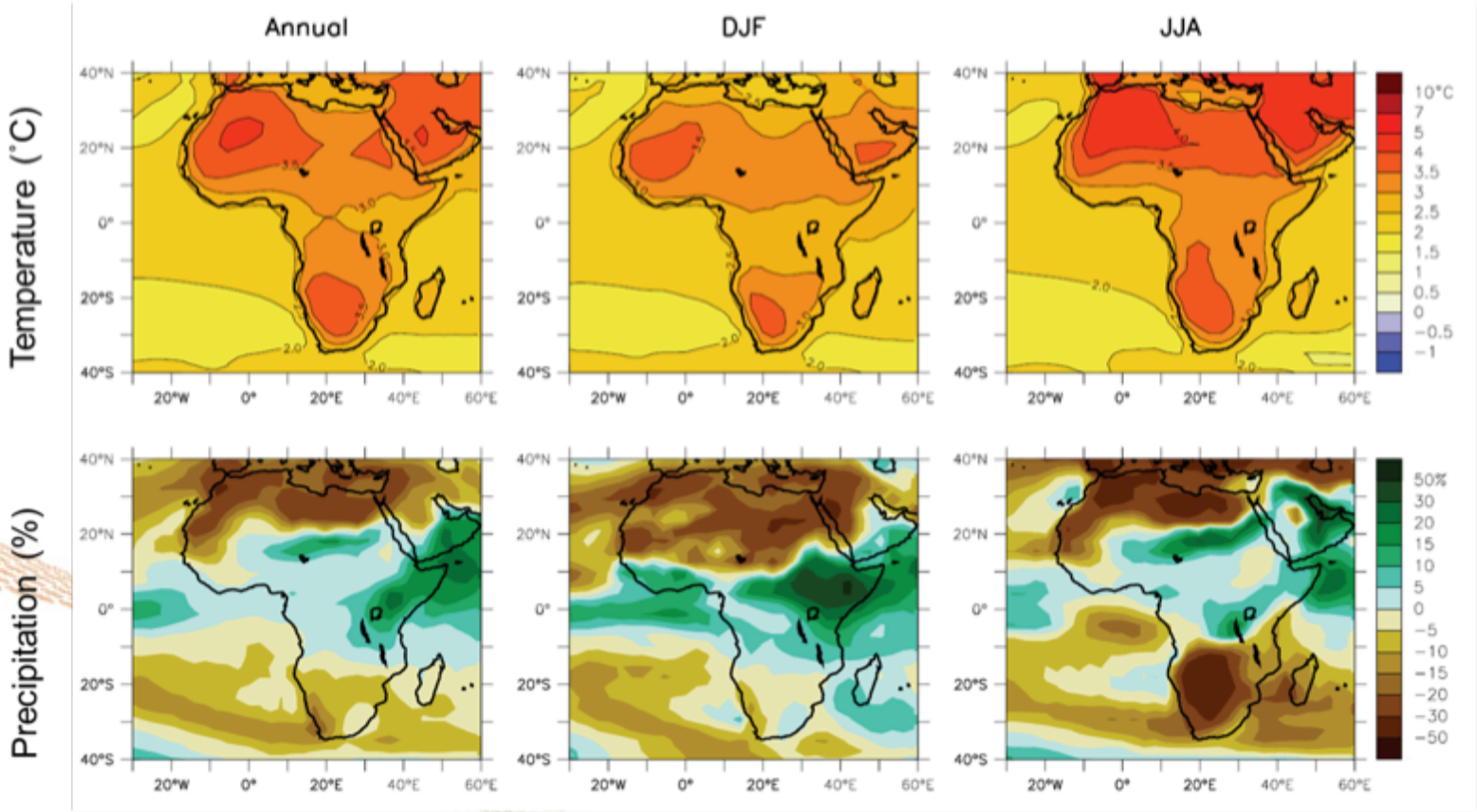
Climate change (2080-2099 vs 1980-1999)
A1B emissions scenario, average of 21 GCMs



Christensen et al., IPCC, AR4, Ch 11, 2007

Moving to a changed cropping system

Minimum intervention - market forces will prevail

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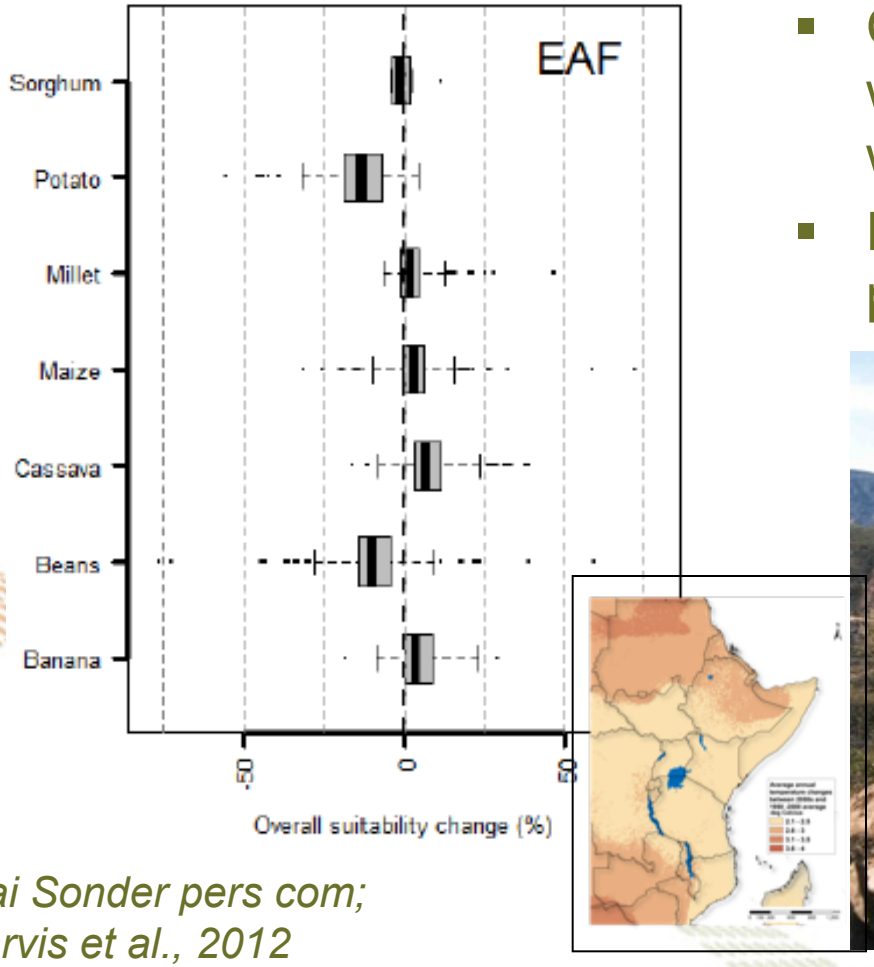

- Changes in temperature and/or rain will change what can be grown and where
- Farmer and market adaptation will prevail and keep pace?

Kai Sonder pers com;
Jarvis et al., 2012

Maintaining crops in the system

By the will of science

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- Blue sky intervention will provide resilience, even allow us to grow our preferred crops in new environments

BBSRC 20 Years of Pioneering Great British Bioscience

DFID Department for International Development

Agri-Tech Catalyst Helping to commercialise UK agricultural innovation

Bill & Melinda Gates foundation

The prevailing environment

The silent factors

- Within-field weeds and vegetation of field margins will evolve with climate change
- This will provide ‘evolved’ reservoirs of largely unknown pest and disease threat to crops

Crop pest 5-10+ years

*More! Less! Different **yes***

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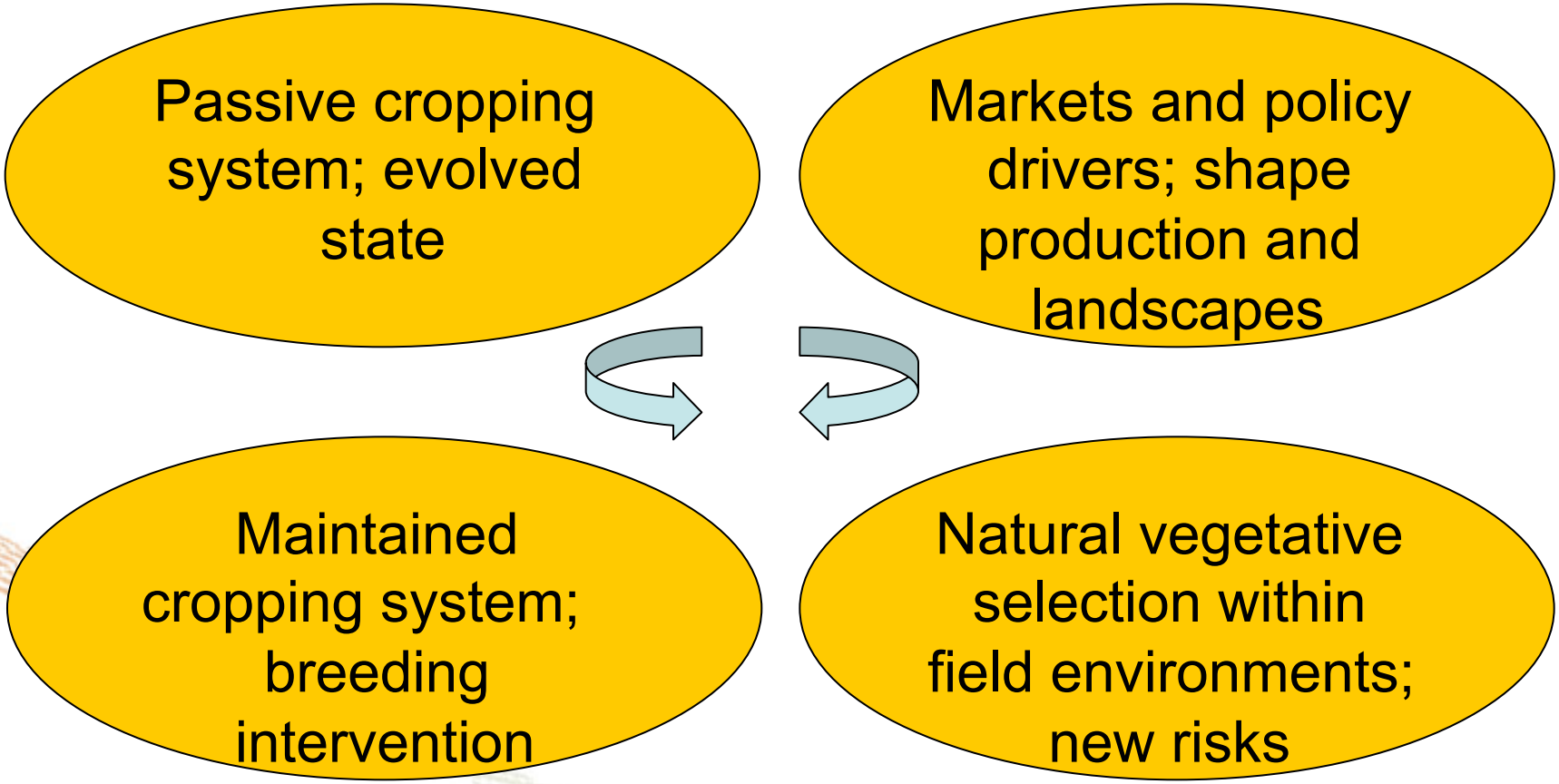

Something about weather

A clear and imminent danger – a UK example

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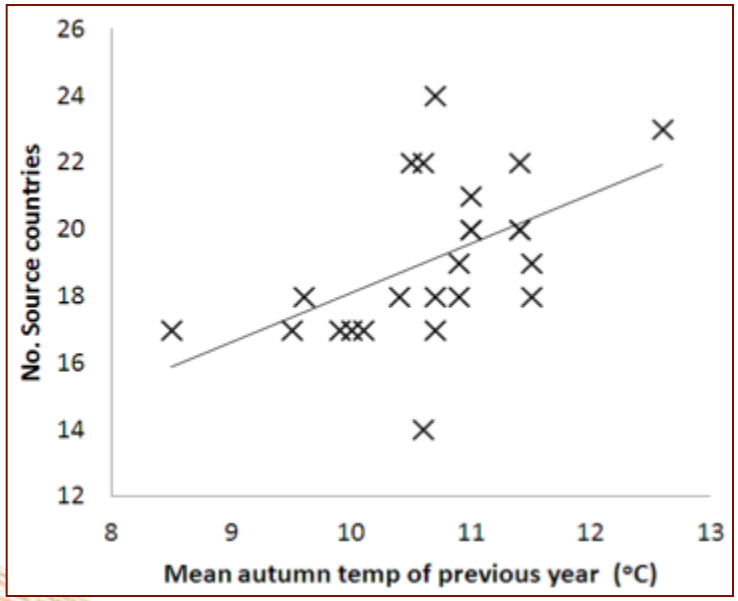

Preliminary analysis on potato show association between number of import countries to UK and mean autumn temperature rise: 1986-2010
(Note: association is not proof of causation (Fera unpublished))

- Record rain recorded in UK summer months of 2010
- UK Potato harvest was massively reduced
- UK markets responded by buying in potato from overseas in bigger volumes and from new sources
- Plant health services increase portside inspection
- Potato ring rot interceptions increase

What can we do?

The challenge to the panel

- Pest risk analysis
- Modelling of crop and pest dynamics
- Diagnostics and surveillance
- Plant breeding
- Policy strengthening
- Work closer with industry and especially food procurers
- Other

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Climate change in the round

Actions for today, gives readiness for tomorrow

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- Shock events ‘trump’ incremental impacts
- Africa lacks capacity to mitigate against new entrant pests and diseases
- As change in climate and weather changes the risk of crop pest events, more focus must be given to plant health services
- National Plant Protection Organisations are the *Cinderella* of development and a victim of a overt R&D agenda
- A signature of a mature country agricultural system is one that invests more ***today in prevention*** than ***tomorrow on cures***

What success looks like

An uphill struggle!

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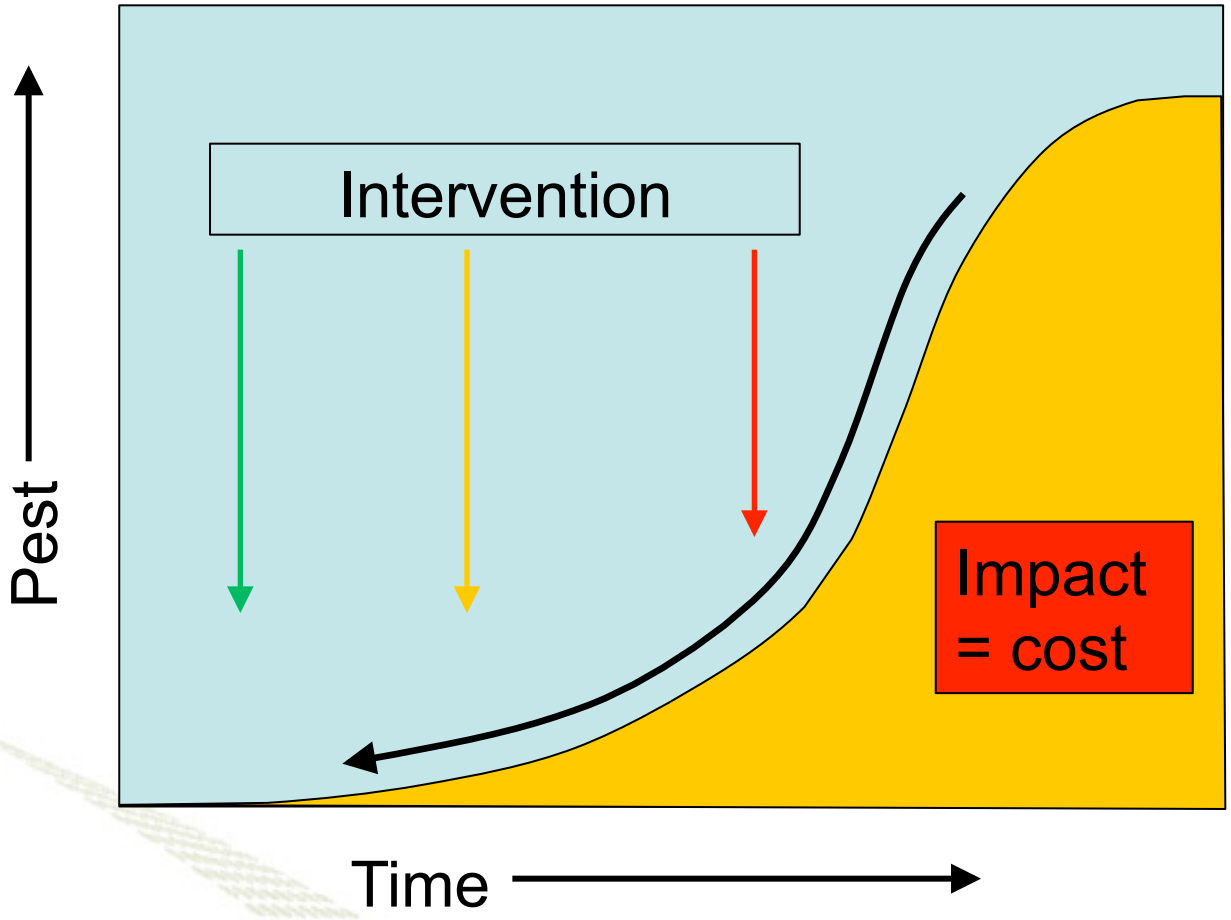

Thank you

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