

# Innovative Approaches to Extension in Organic and Sustainable Agriculture

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and Mary Burrows

STEM | OUTREACH RESEARCH GROUP  
MONTANA STATE UNIVERSITY

## I am...

- Farmer / rancher
- Extension agent
- Consultant
- Faculty / researcher
- Student
- Other



## Excellence in Organic Extension Webinar Series

Excellence in Organic Extension Webinar Series			
September 9, 2013	<a href="#">Watch</a>	<a href="#">Effective Presentations: How to develop and deliver a farmer-friendly talk</a>	Seth Wilner, University of New Hampshire
October 7, 2013	<a href="#">Watch</a>	<a href="#">Be my friend: Utilizing social media such as Facebook, Twitter, and Pinterest to engage and interact with your audience</a>	Debbie Roos, North Carolina State Extension, Chatham County; Debra Heleba, University of Vermont Extension
October 21, 2013	<a href="#">Watch</a>	<a href="#">Out in the sun: How to plan and put on an engaging, informative and successful field day</a>	Charlie White, Penn State University; Molly Hamilton, North Carolina State University
November 4, 2013	<a href="#">Watch</a>	<a href="#">How am I doing: Improving your program by evaluating your extension program with feedback and follow-up</a>	Seth Wilner, University of New Hampshire; Anu Rangarajan, Cornell University

## Excellence in Organic Extension Webinar Series

How many of these webinars did you watch/attend?

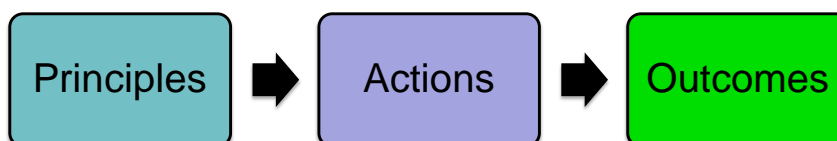
- None
- 1
- 2
- 3
- All of them



The movement towards stronger participation by farmers in agricultural research and extension is fuelled by a growing realization that the socio-economic and agro-ecological conditions of farmers are complex, diverse and risk-prone, and that conventional approaches, based on research station trials followed by unidirectional technology transfer, are unlikely to be fruitful

Farrington, 1998

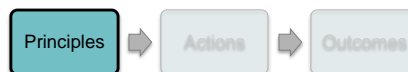
## Participatory-based Approach Logic Model





## Inputs of Participatory Approach

- Equitable relations between researcher and community members -- building trust and shared power
- Pursue of new knowledge production integrating practitioners and discipline-specific wisdoms
- Participant's self-reflection as a conduit to rethink key actions and decisions



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## Actions of Participatory Approach

- Identifying local problems affecting local conditions
- Investigating the conditions leading to problems
- Participation of community members in diagnosis, experimentation, and dissemination



## Participatory-based R&E Process

- Identifying the problem
- Setting objectives
- Selecting solutions and project design
- Implementing the project
- Interpreting the observations
- Sharing the results

Maguire, 1987



## Outcomes of Participatory Approach

- Promotes long-term collaborations between researchers, educators and community members
- Effective for holistic rather than single practice change
- Address a wide range of environmental and socio-economic conditions
- Effective for developing educational material in integrated subject areas



## Outcomes of Participatory Approach

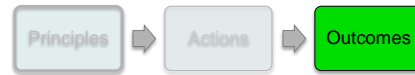
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But, what framework drives our extension programs?

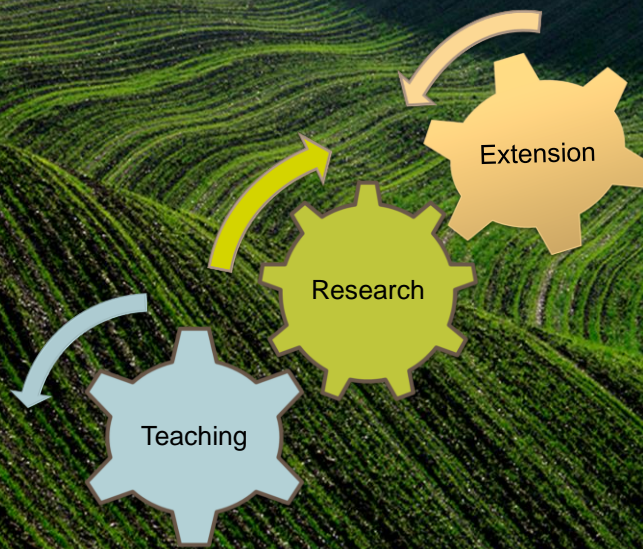


“...to teach...agriculture  
and the mechanic arts,...to  
promote the liberal and  
practical education of the  
industrial classes “

Morrill Act, 1862



## Land Grant Universities





## Land Grant Universities



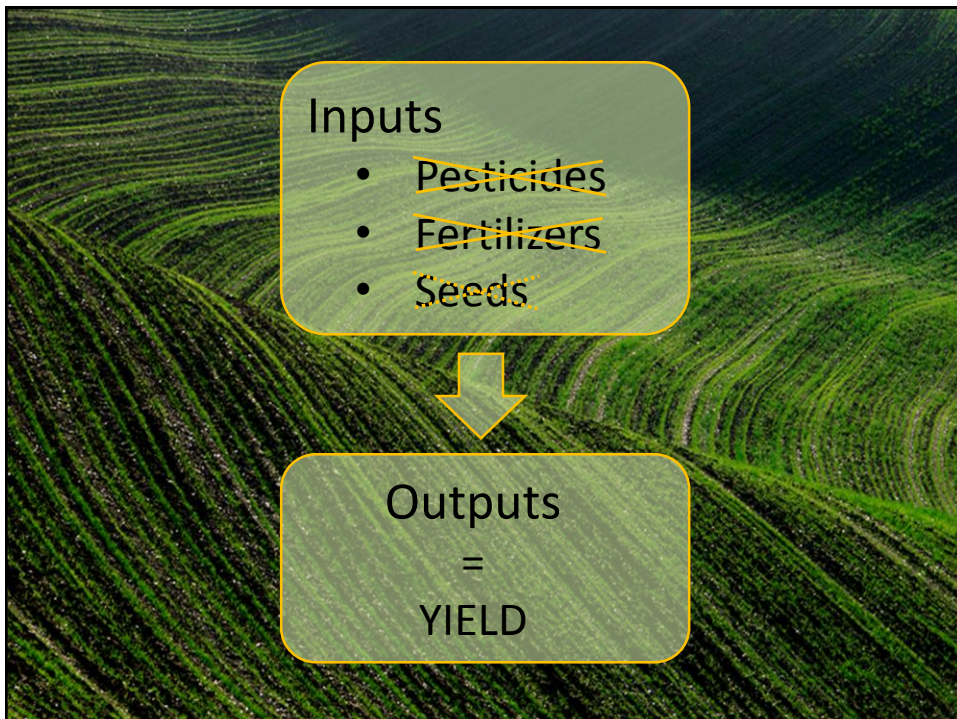
## Land Grant Universities



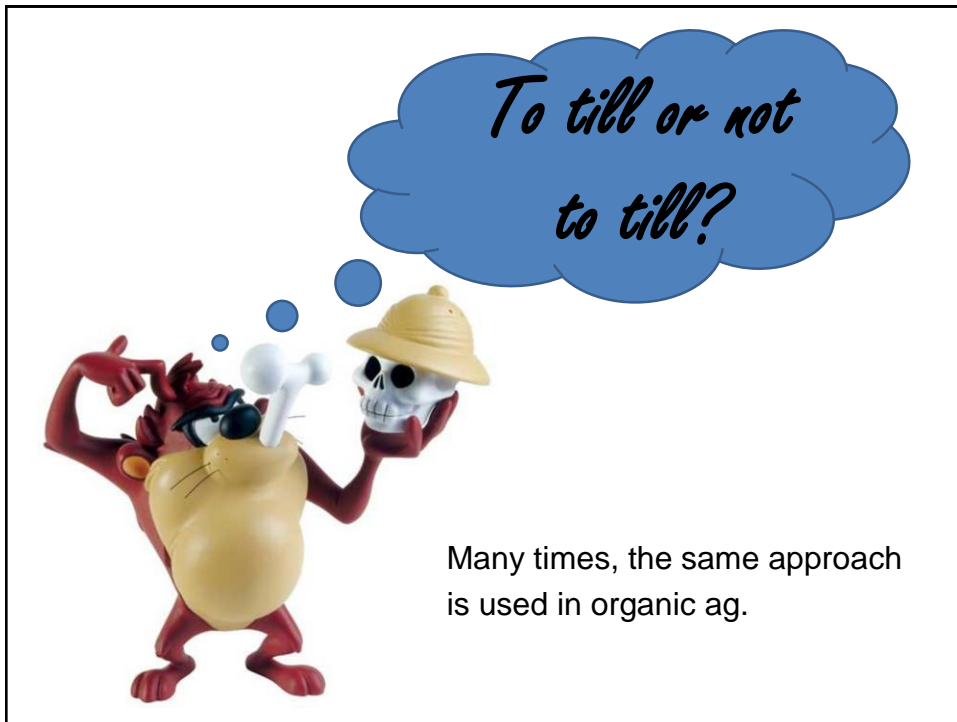


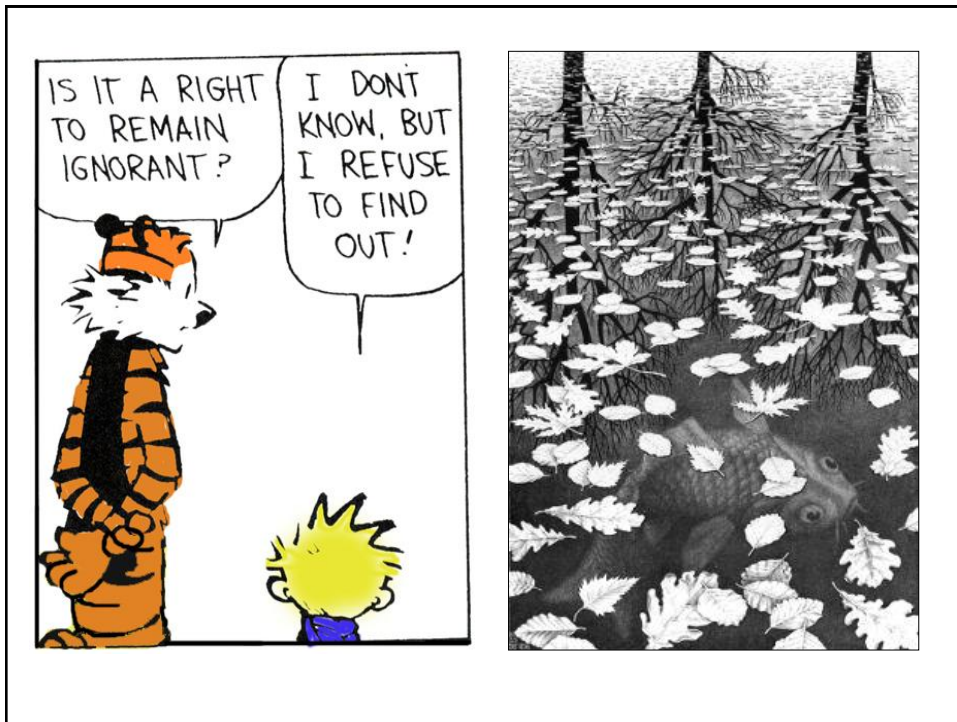
*Because I say so*

(after all, I have a PhD)







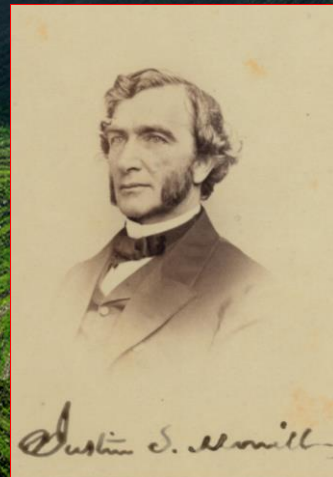




Is there an unifying principle to Extension in  
organic and sustainable agriculture?

“...to teach...agriculture  
and the mechanic arts,...to  
promote the liberal and  
practical education of the  
industrial classes “

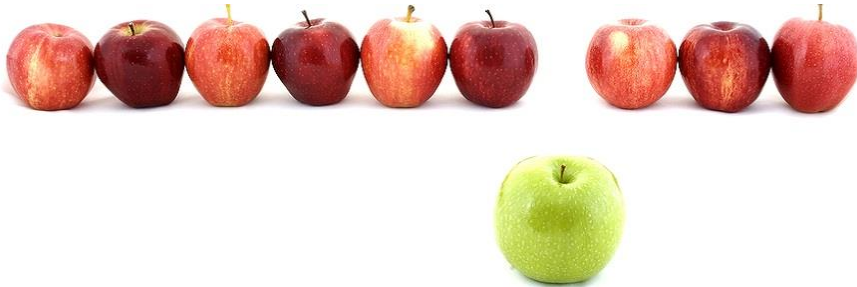
Morrill Act, 1862



“Approach to learning that empowers individuals and  
prepares them to deal with complexity, diversity, and change”

Association of American Colleges and Universities, 2013

## New approach to extension...



Farming is a socio-ecological  
system-level enterprise with  
system-level responses

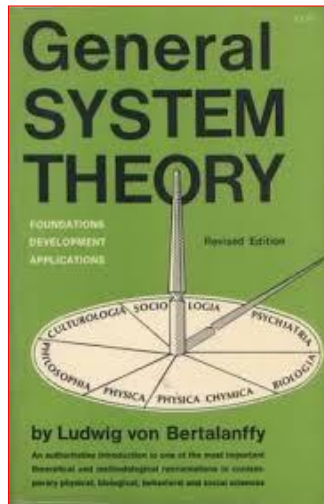
- ecosystems services

Adapted from Gallopin 2006 & Robertson et al. 2004



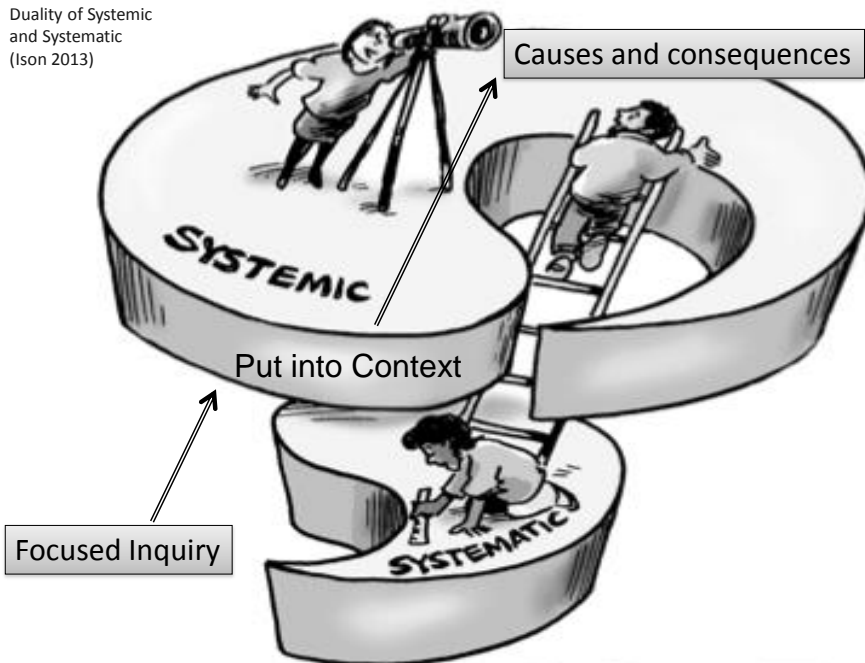
System-level  
extension

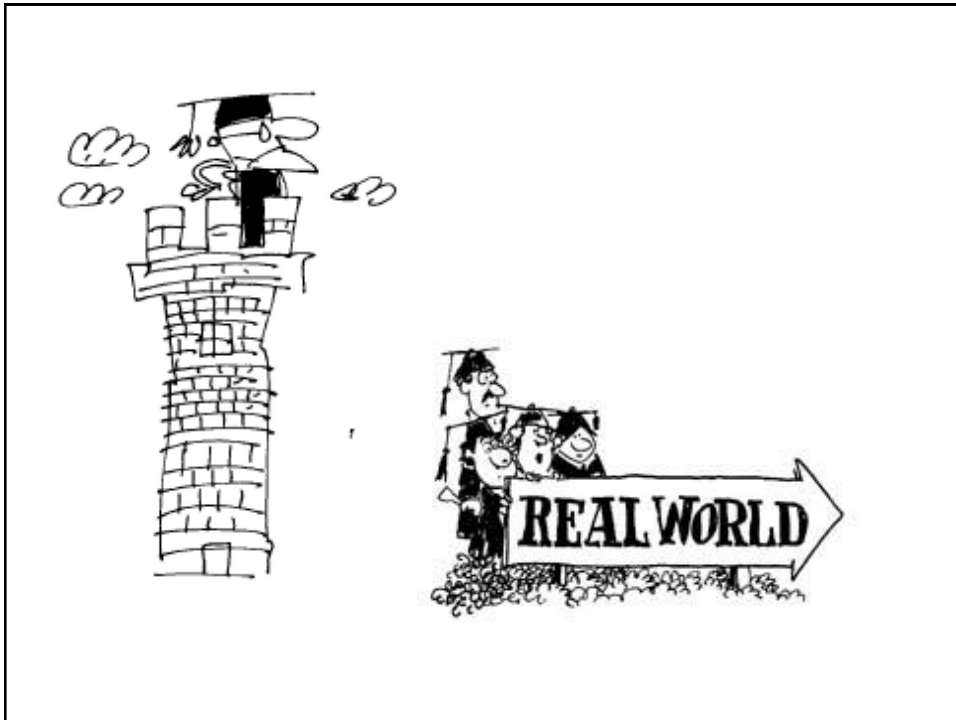




Ludwig von Bertalanffy (1901—1972)

Duality of Systemic  
and Systematic  
(Ison 2013)





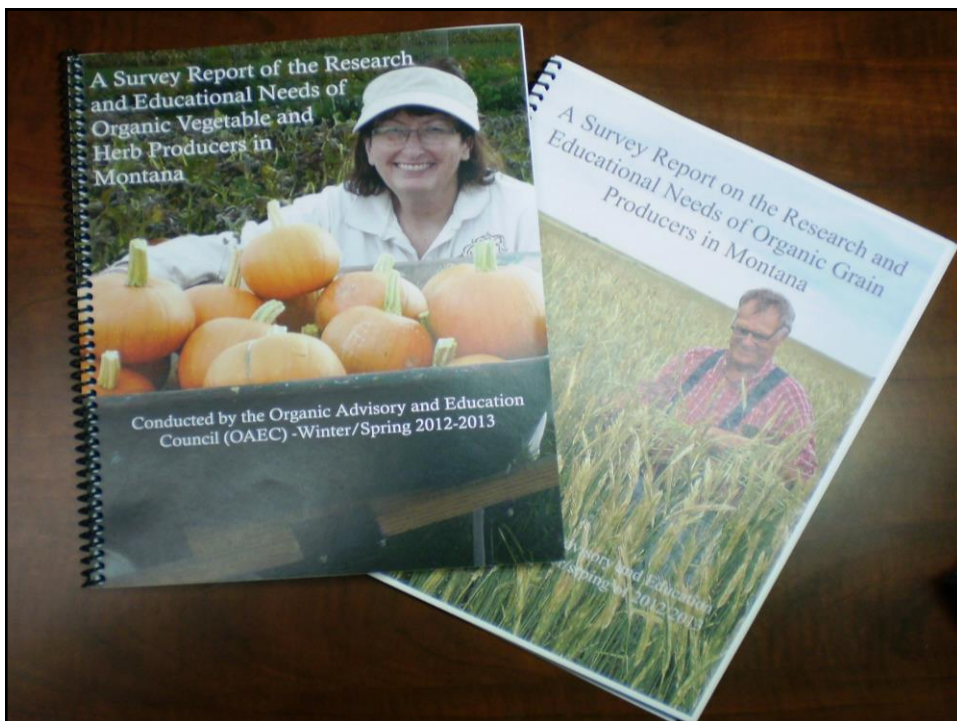
I use a system-level perspective in  
my Extension programs

1. Always
2. Sometimes
3. Never



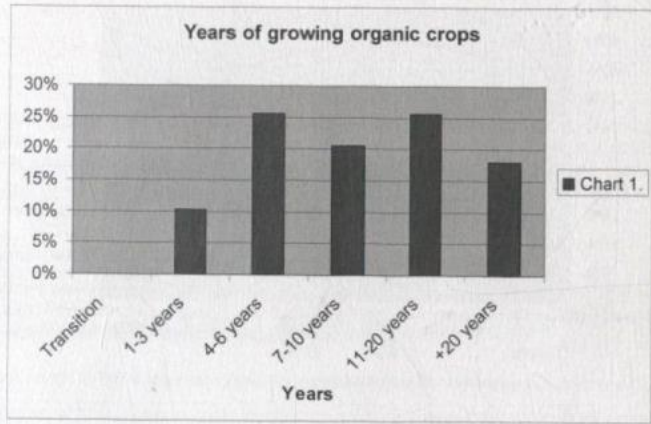
## Example of Participatory-based R&E:

- ➡ Producers, researchers, consultants
  - Survey results
- Example
  - Management of an interacting multi-trophic pest complex



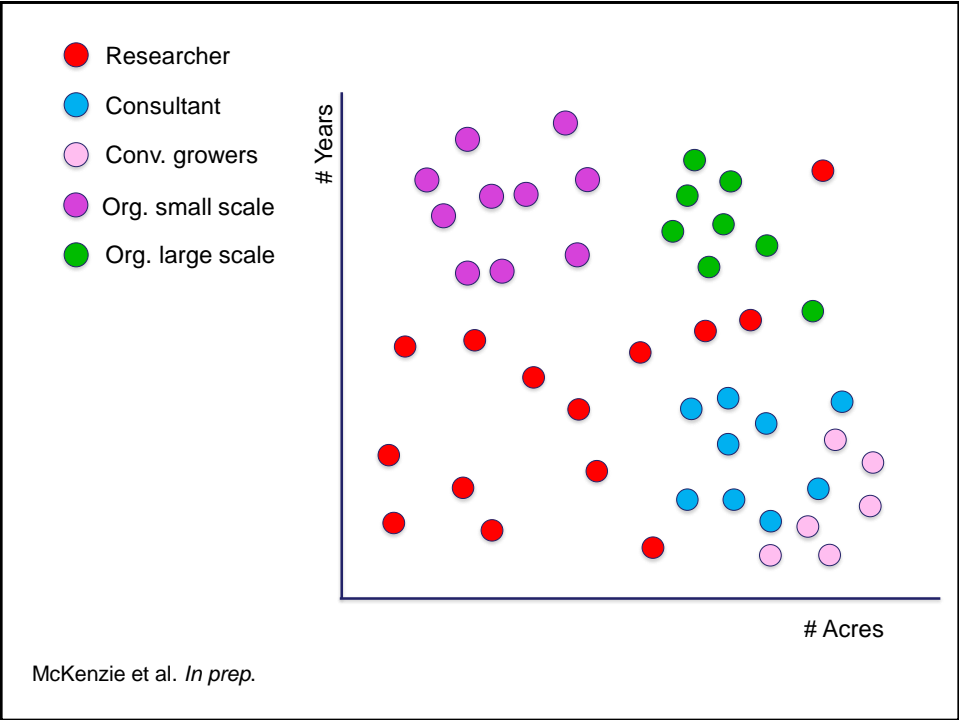


Question #2: How long have you been growing organic crops?



## Multiple choice answers

		answer																								
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	2																									
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# Multiple choice answers

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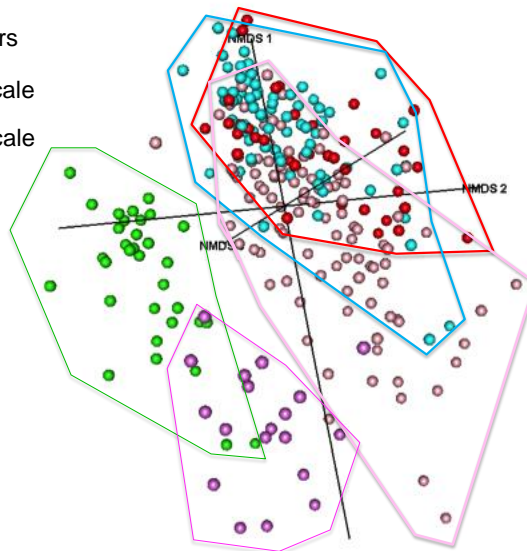


# I am...

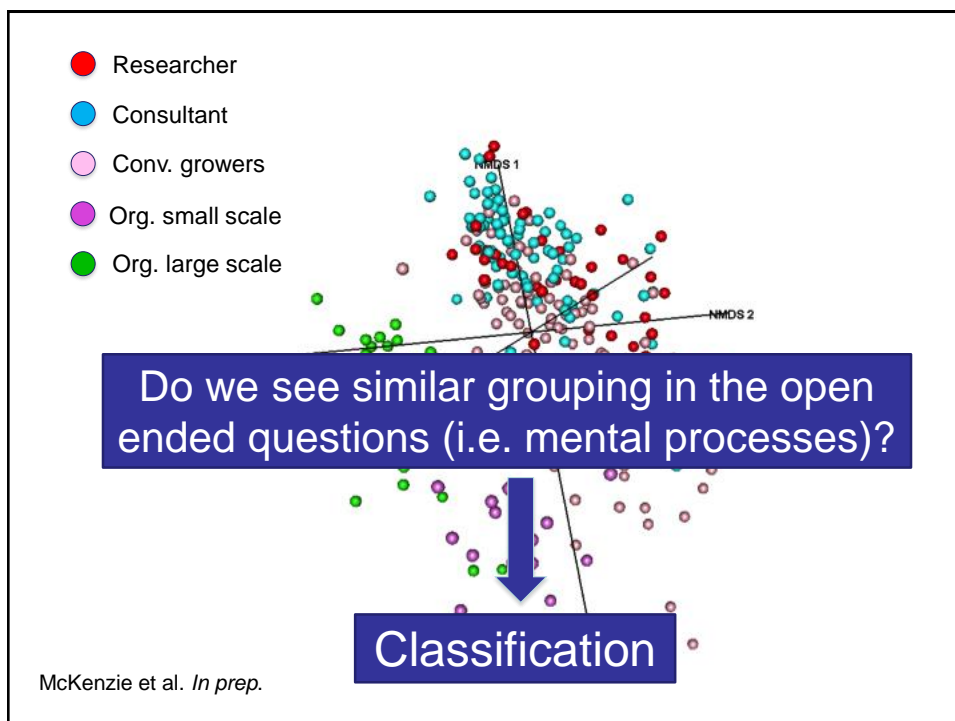
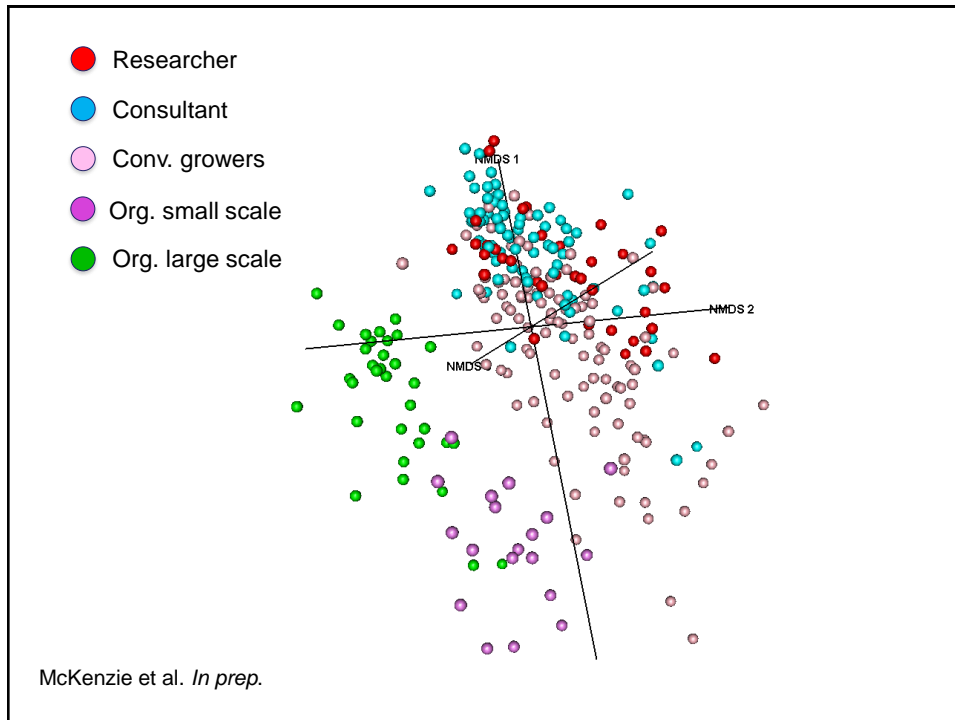
- Very familiar with multivariate analysis (ordination and classification)
- Somewhat familiar
- Not familiar

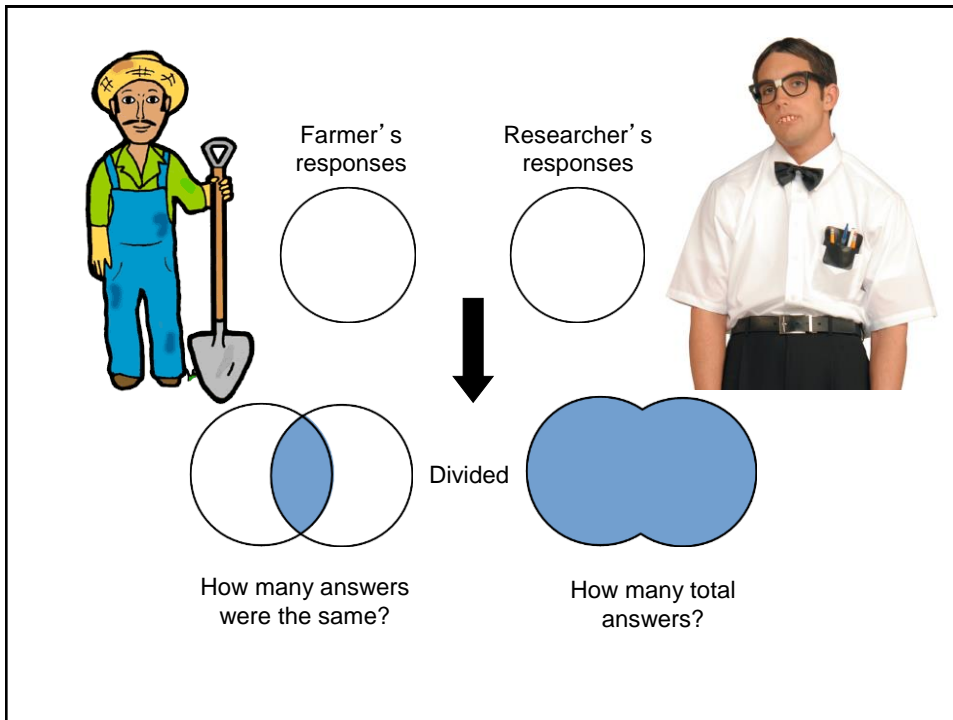


- Researcher
- Consultant
- Conv. growers
- Org. small scale
- Org. large scale



McKenzie et al. *In prep.*





## Hierarchical Clustering

### Finding groups of respondents with similar answers

Fuse each respondent to his/her most similar neighbor

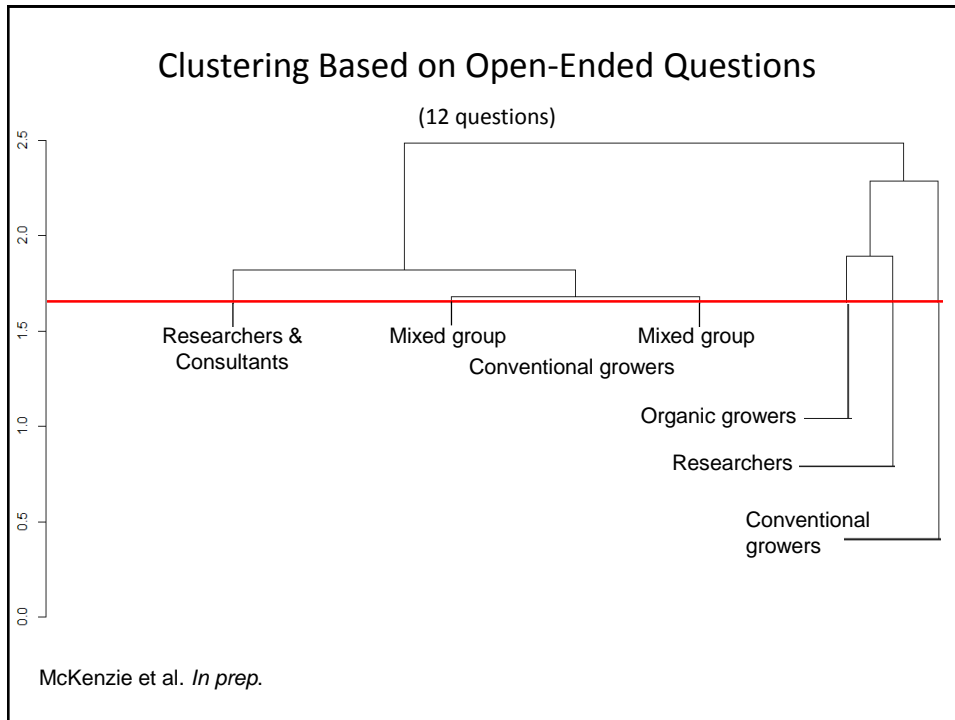


Fuse each newly formed group to its most similar neighbor



Continue until no more fusions can be made





## What's on their minds?

### • Traditional Researcher – Consultant Group

- Get farming information from media outlets
- Soil research: changes in agronomic soil inputs and outputs

### • Organic Group

- Weed research: specific species (perennials)
- Conducting on-farm research on pest management and agronomic practices

### • Alternative Researcher Group

- Agroecological factors
  - Competition
  - Herbicide resistance

## Findings

- Some conventional producers think similarly as organic producers
  - Find your partner at the coffee shop
- Researchers span their interests across conventional and organic issues
  - Find your partner within your State University
- Consultants should re-focus their attention to get in touch with both conventional and organic producers as well as with researchers

- How can we bridge the gap between farmers, researchers, and consultants?
- How can we stimulate the dialogue between organic and conventional farmers interested in sustainable agriculture ?
- How can we foster system thinking?

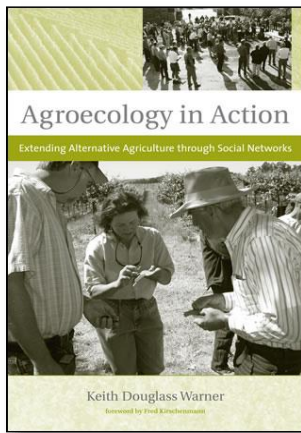


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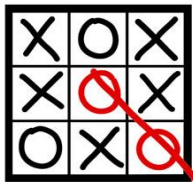


I have read *Agroecology in Action*  
by K. D. Warner

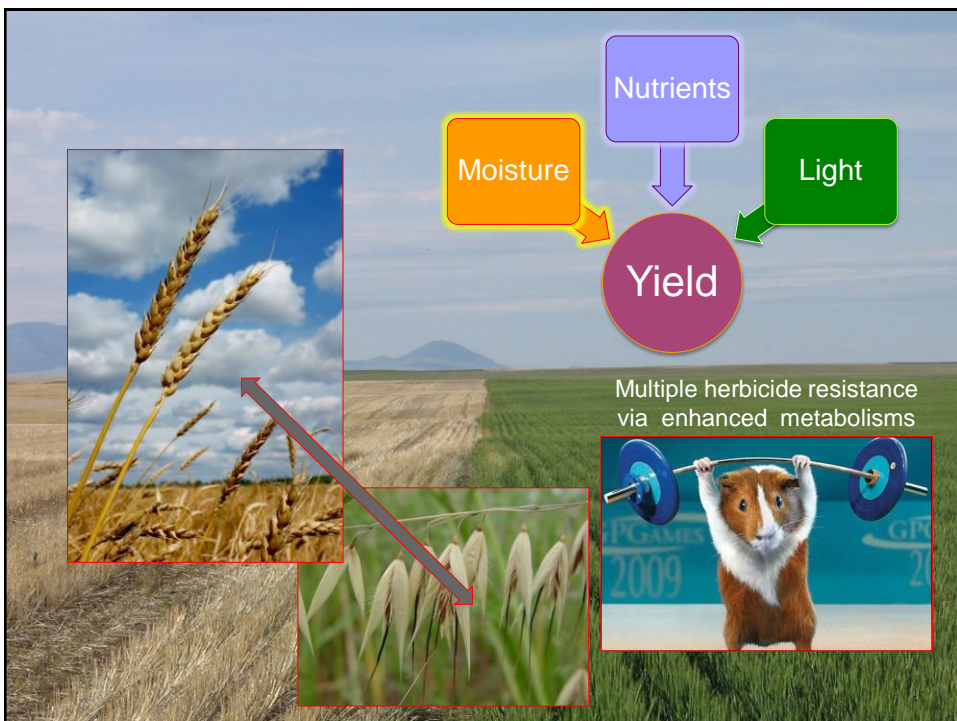
- Yes
- No

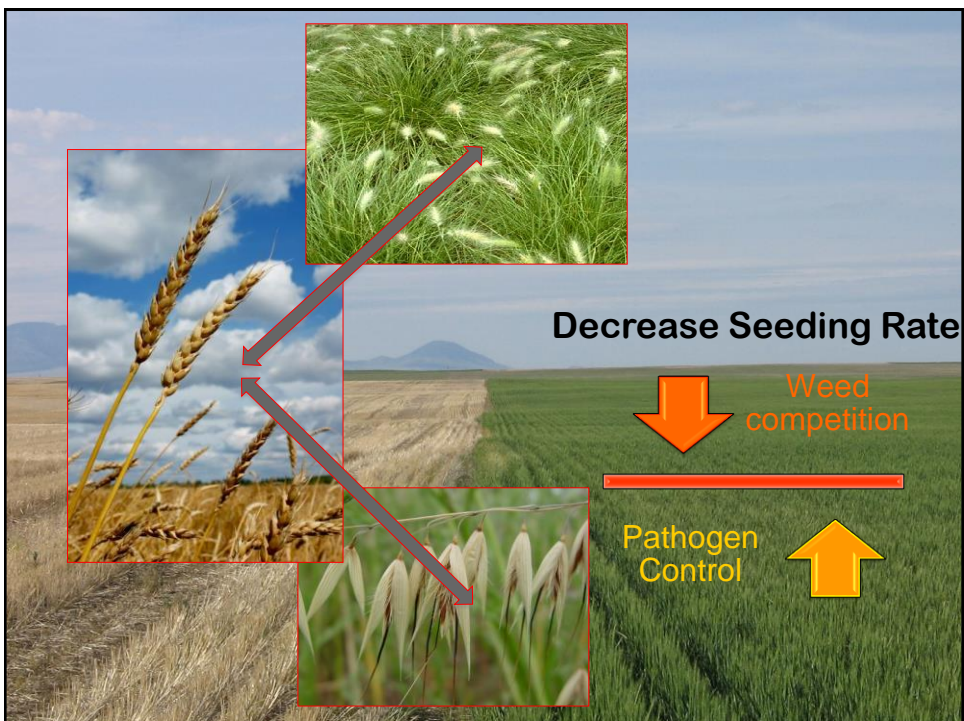


**THINK  
OUTSIDE  
THE BOX**

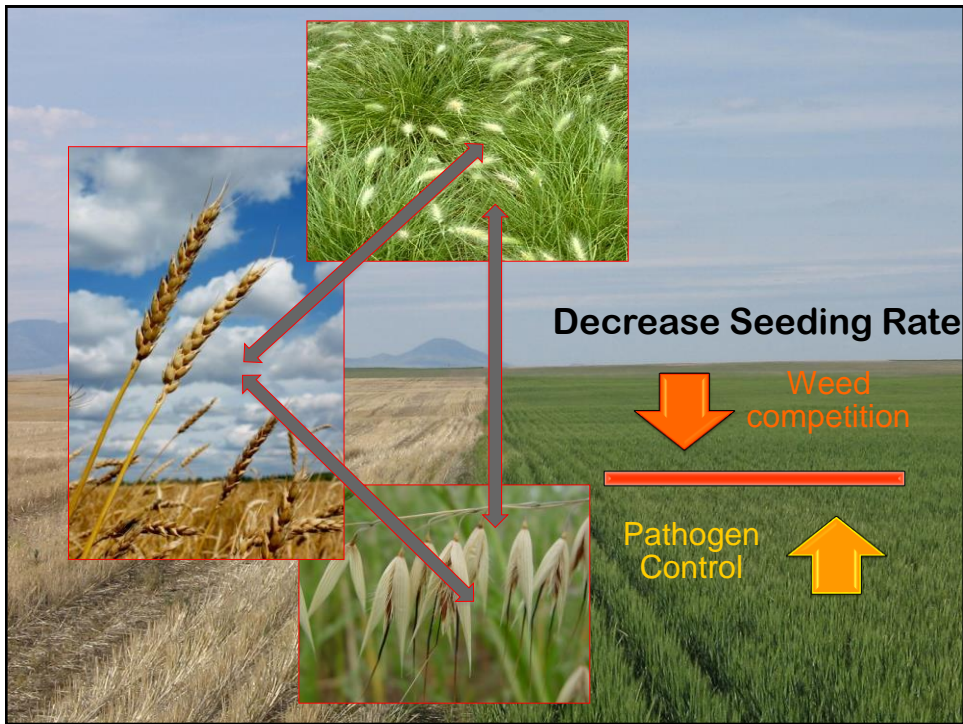








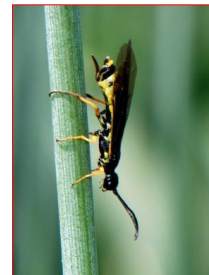






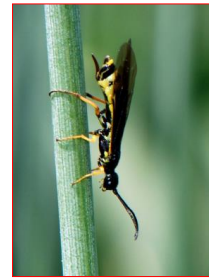
## Wheat Stem Sawfly Management

- Solid stem varieties (Choteau)
- But...
  - Low yield potential
  - Low competitive ability



# Wheat Stem Sawfly Management

- Solid stem varieties (Choteau)
- But...
  - Low yield potential
  - Low competitive ability
  - Increasing seeding rate results in
    - Lose of stem solidness
    - Increase Fusarium pressure







Given a specific goal,  
your task is to manage  
multiple herbicide  
resistance wild oats,  
Fusarium crown rot, &  
wheat stem sawfly

What would be your  
recommendation?





## **The nature of the “question” drives the type of Extension**

- The scope of a question derives from understanding inter- and intra-relations among agro-ecosystem components
- The effectiveness of a response derives from understanding interactions among the agro-ecosystem and stakeholders
- The sustainability of a practice derives from adapting responses to changing environments



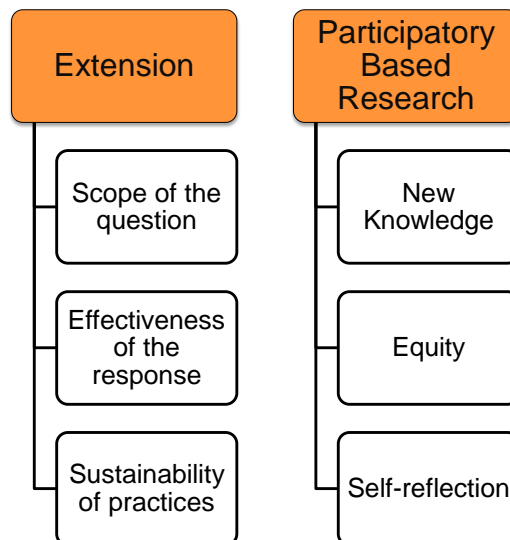
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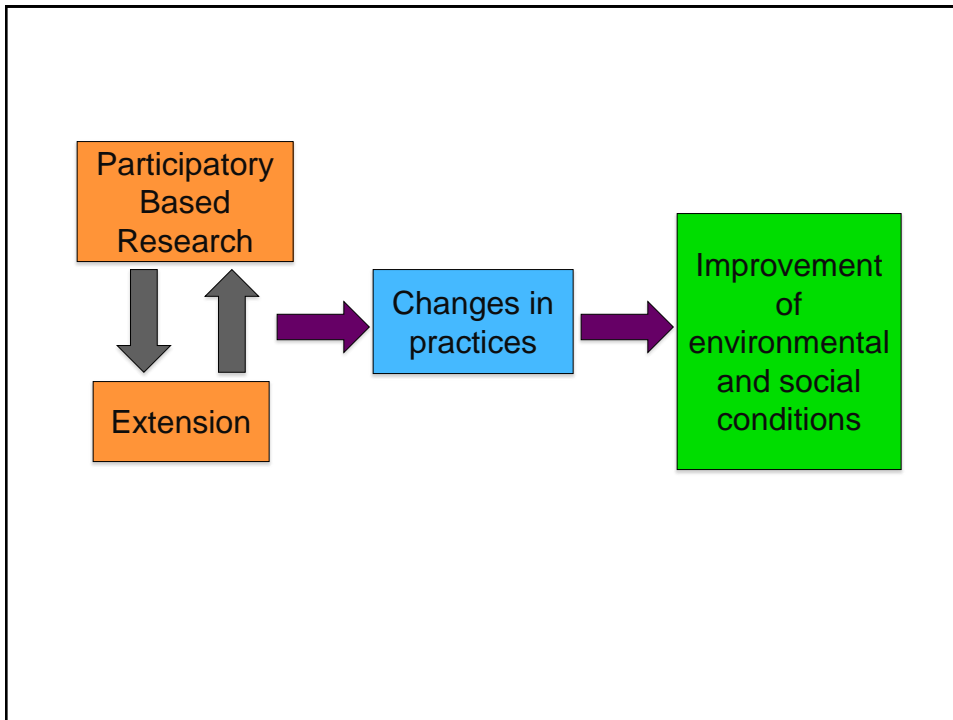
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Give us an example of a system level question





Agroecology can be effectively put into action only when networks of farmers and scientists learn together about the local ecological conditions. Agroecology cannot be “transferred” in the way a chemical or mechanical technology can; it must be facilitated by social learning.

K. D. Warner. 2007. *Agroecology in Action*

An aerial photograph of a landscape featuring terraced green hills, likely a vineyard or agricultural field, with rows of plants visible. The hills are covered in lush green vegetation, and the terracing creates a series of curved, parallel lines across the slope.

# Thank you!

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