Rogers' Diffusion of Innovations curve

Drivers of Farmer and Agricultural Stakeholder Decision Making and Actions

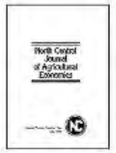
Linda S. Prokopy

PURDUE UNIVERSITY
Horticulture and Landscape Architecture

Are cover crops being used in the US corn belt?

J.W. Singer, S.M. Nusser, and C.J. Alf

Abstract: The benefits of using cover crops are well established, but adoption in agronomic farming systems is unknown. The objectives of this study were to quantify cover crop use



JOURNAL ARTICLE

Farm Family Resources and the Adoption of No-Plow Tillage in Southwestern Wisconsin

John Belknap and William E. Saupe

North Central Journal of Agricultural Economics
Vol. 10, No. 1 (Jan., 1988), pp. 13-23 (11 pages)
Published By: Oxford University Press

https://doi.org/10.2307/1349232

doi:10.2489/jswc.73.2.143

Farmer adoption of cover crops in the western Lake Erie basin

E. Burnett, R.S. Wilson, A. Heeren, and J. Martin

Abstract: Runoff from agricultural nutrient applications is the most significant human factor leading to phosphorus (P) loading and water quality issues in western Lake Erie. Recent

Measuring and understanding agricultural producers' adoption of nutrient best management practices

J.D. Ulrich-Schad, S. García de Jalón, N. Babin, A. Pape and L.S. Prokopy

Journal of Soil and Water Conservation September 2017, 72 (5) 506-518; DOI: https://doi.org/10.2489/jswc.72.5.506

doi:10.2489/jswc.71.1.29

Perceptions and use of cover crops among early adopters: Findings from a national survey

M. Dunn, J.D. Ulrich-Schad, L.S. Prokopy, R.L. Myers, C.R. Watts, and K. Scanlon

Abstract: There is evidence that cover crops can bring both environmental and yield benefits to a farm operation, yet according to the USDA's Census of Agriculture, in 2012 less than 5% of the nation's total row crop land was planted to cover crops. In 2014, the Sustainable

Renewable Agriculture and Food Systems: Page 1 of 12 doi:10.1017/S1742170517000205

The trouble with cover crops: Farmers' experiences with overcoming barriers to adoption

Gabrielle E. Roesch-McNally[1]*, Andrea D. Basche[2], J.G. Arbuckle[3], John C. Tyndall[4], Fernando E. Miguez[5], Troy Bowman[6] and Rebecca Clay[5]

Journal of Agricultural and Applied Economics (2019), 1–18
doi:10.1017/aae.2019.20

CAMBRIDGE UNIVERSITY PRESS

RESEARCH ARTICLE

Adoption of Cover Crops by U.S. Soybean Producers

Seungyub Lee* and Laura McCann

Department of Agricultural and Applied Economics, University of Missouri, Columbia, Missouri, USA
*Corresponding author. Email: slb66@mail.missouri.edu

Abstract
Using cover crops can be beneficial not only for soil health but also for the environment. However,

Midwestern US Farmers Perceive Crop Advisers as Conduits of Information on Agricultural Conservation Practices

Francis R. Eanes ✉, Ajay S. Singh, Brian R. Bulla, Pranay Ranjan, Linda S. Prokopy, Mary Fales, Benjamin Wickerham & Patrick J. Doran

Environmental Management **60**, 974–988(2017) | Cite this article

doi:10.2489/jswc.74.5.520

Adoption of agricultural conservation practices in the United States: Evidence from 35 years of quantitative literature

L.S. Prokopy, K. Floress, J.G. Arbuckle, S.P. Church, F.R. Eanes, Y. Gao, B.M. Gramig, P. Ranjan, and A.S. Singh

Cover crops use in Midwestern US agriculture: perceived benefits and net returns

Alejandro Plastina[1], Fangge Liu[1], Fernando Miguez[2] and Sarah Carlson[3]

[1]Department of Economics, Iowa State University, 478 Heady Hall, Ames, IA 50011, USA; [2]Department of Agronomy, Iowa State University, 1206 Agronomy Hall, Ames, IA 50011, USA and [3]Practical Farmers of Iowa, 600 Fifth Street, Suite 100, Ames, IA 50010, USA

doi:10.2489/jswc.70.6.418

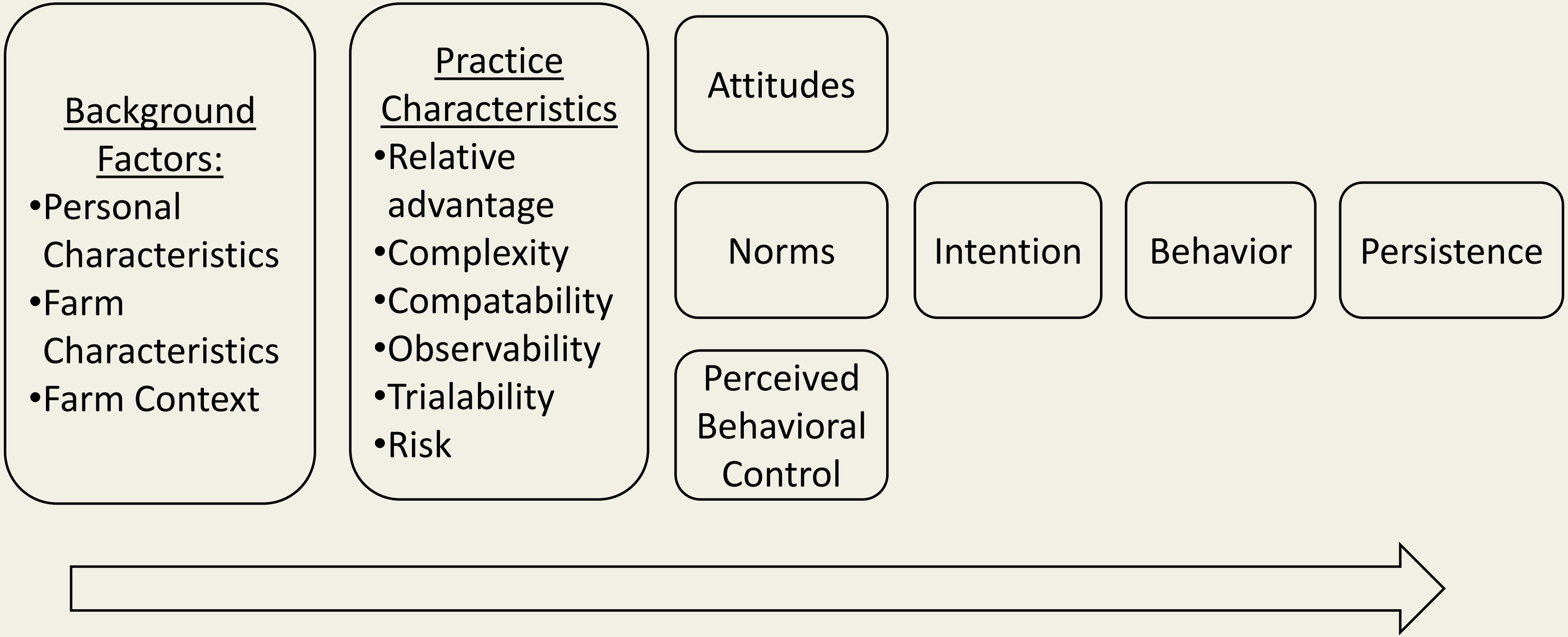
Cover crop adoption in Iowa: The role of perceived practice characteristics

J.G. Arbuckle Jr. and G. Roesch-McNally

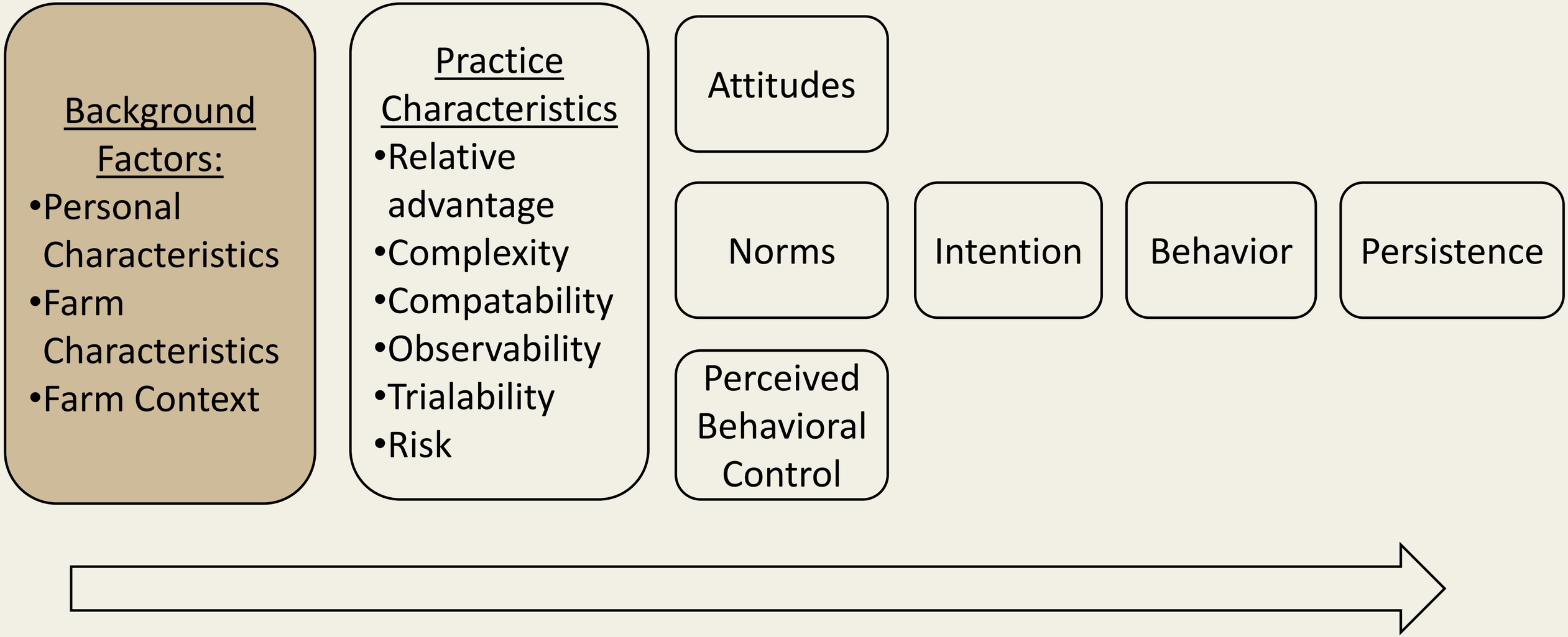
Abstract: Cover crops are widely viewed by the soil and water conservation community to be an effective means for reducing soil erosion and nutrient loss and increasing soil health, yet relatively few farmers have adopted the practice. Despite the widespread recognition of

Synthesizing Conservation Motivations and Barriers: What Have We Learned from Qualitative Studies of Farmers' Behaviors in the United States?

Pranay Ranjan, Sarah P. Church, Kristin Floress & Linda S. Prokopy



Arbuckle and Roesch-McNally 2015; Fishbein and Ajzen 2010; Reimer et al. 2012; Rogers 2003


Background Factors:
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•Farm Context
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Behavior
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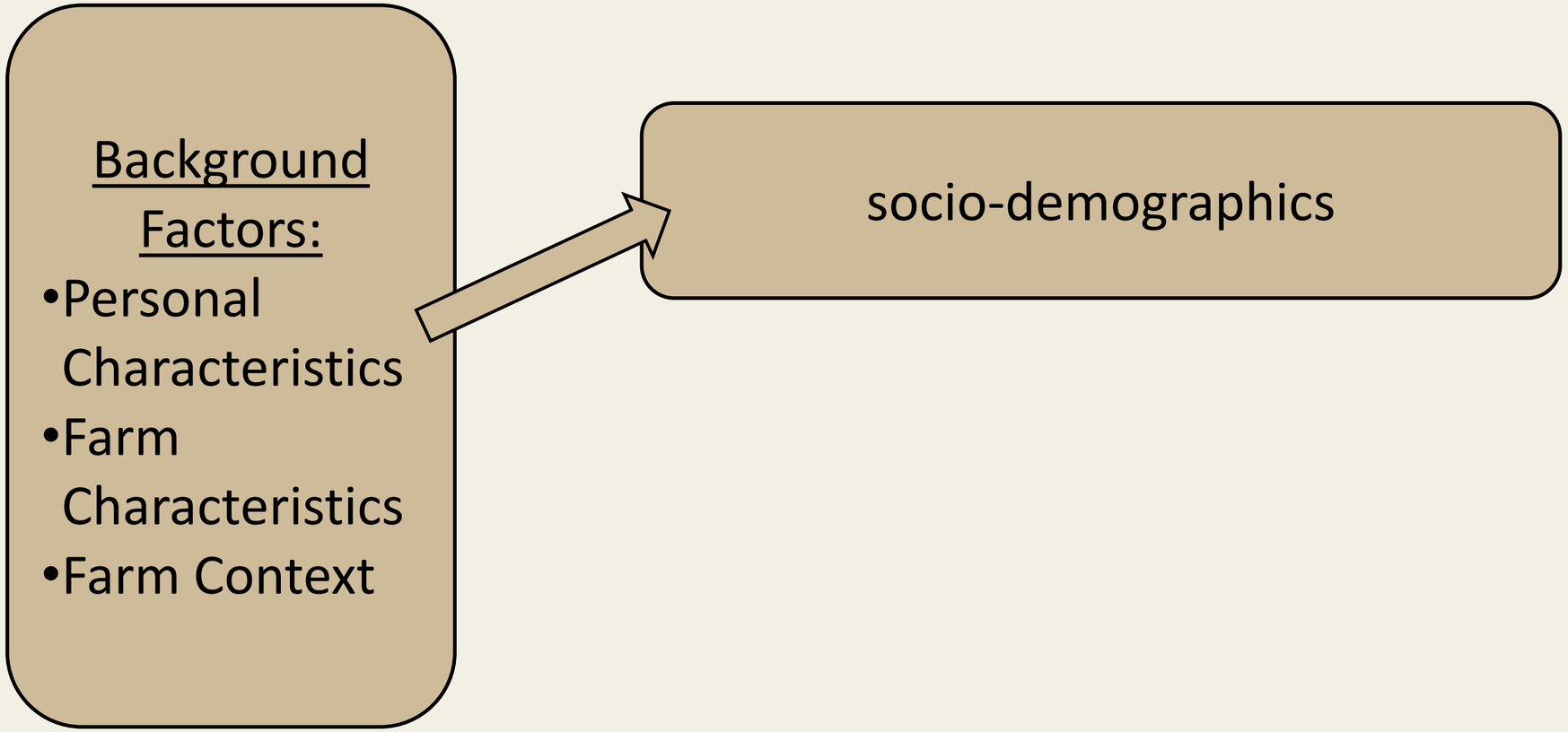
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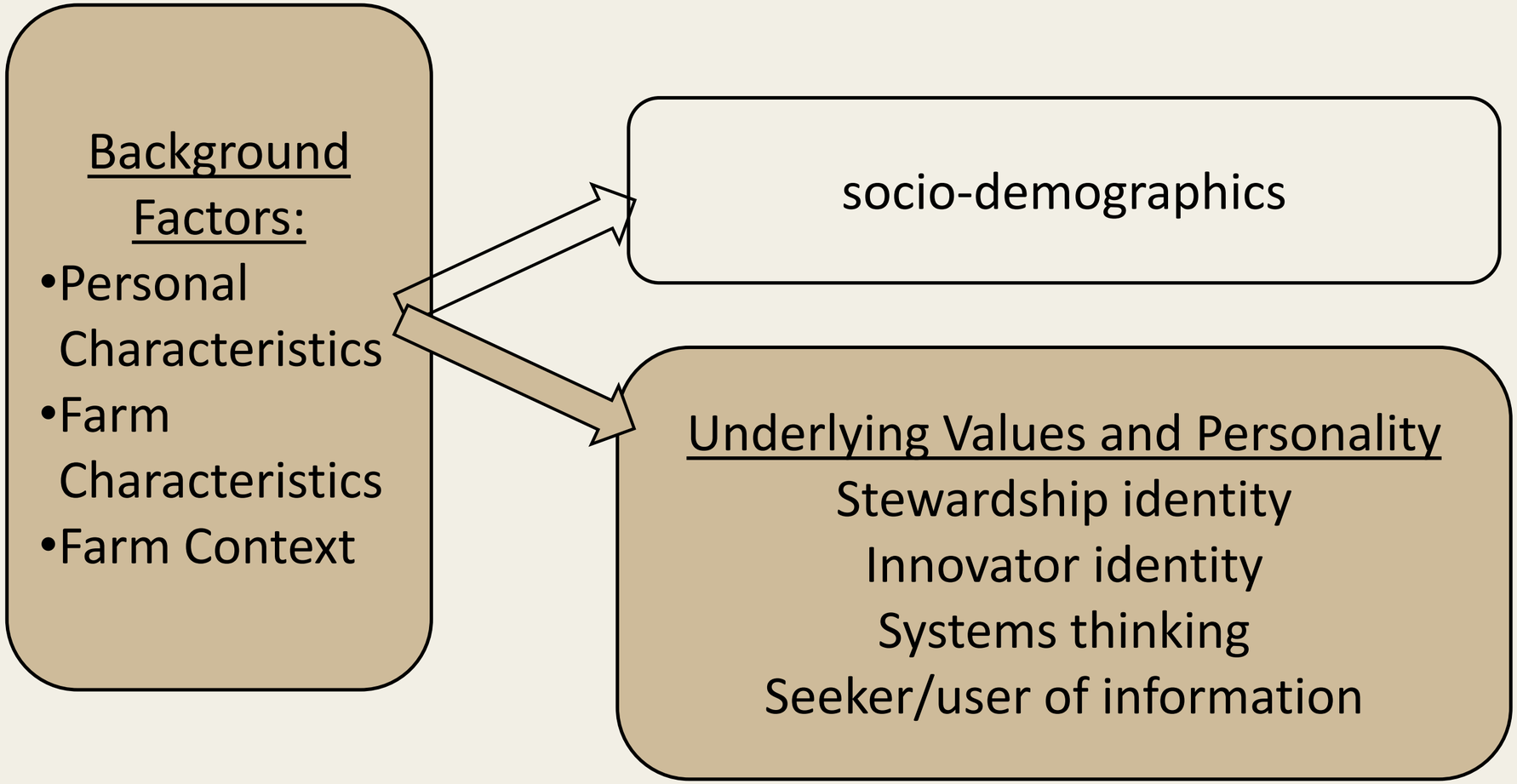
socio-demographics


Background Factors:
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•Farm Characteristics
•Farm Context
socio-demographics
Underlying Values and Personality
Stewardship identity
Innovator identity
Systems thinking
Seeker/user of information

Background Factors:

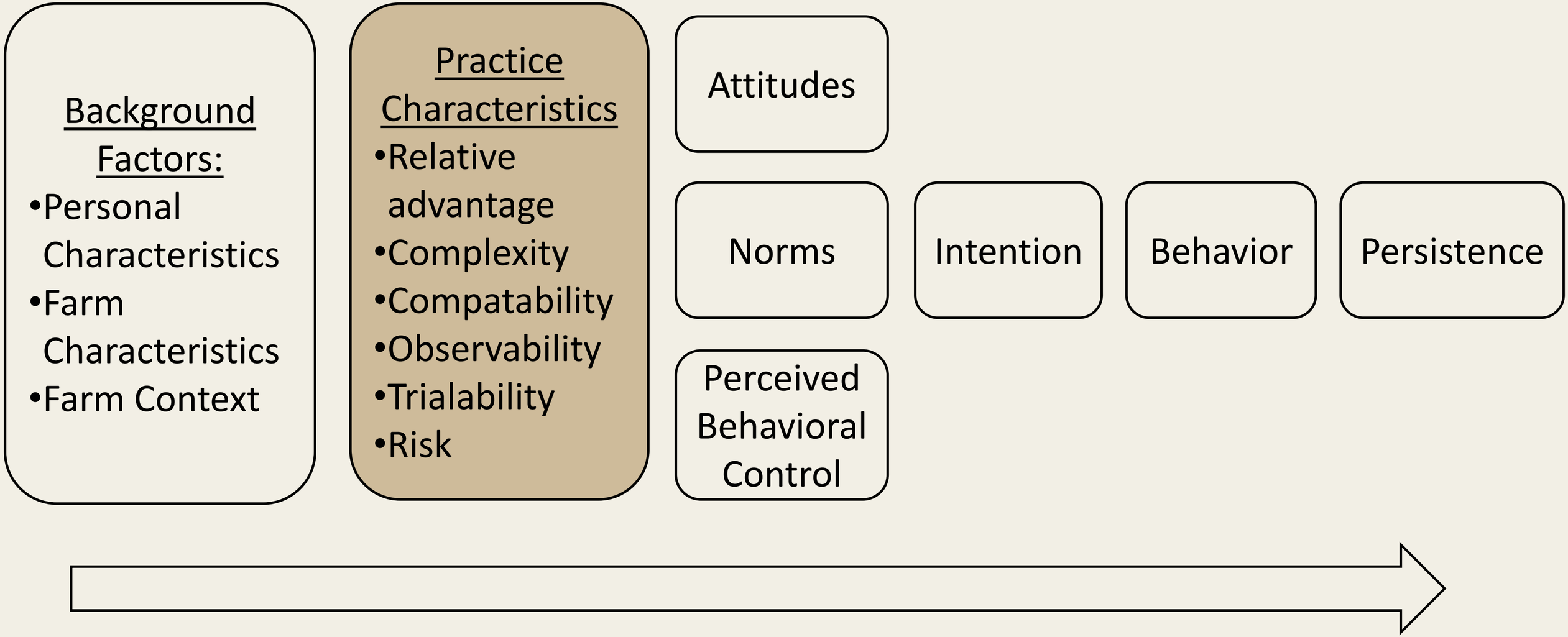
- Personal Characteristics
- Farm Characteristics
- Farm Context

Images: left from treehugger.com; middle from unsplash.com; bottom left from Illinois NRCS; right from Iowa State

Background Factors:

- Personal Characteristics
- Farm Characteristics
- Farm Context

Images: top left from sustainablereturns.com; remainder free clipart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Cover Crops

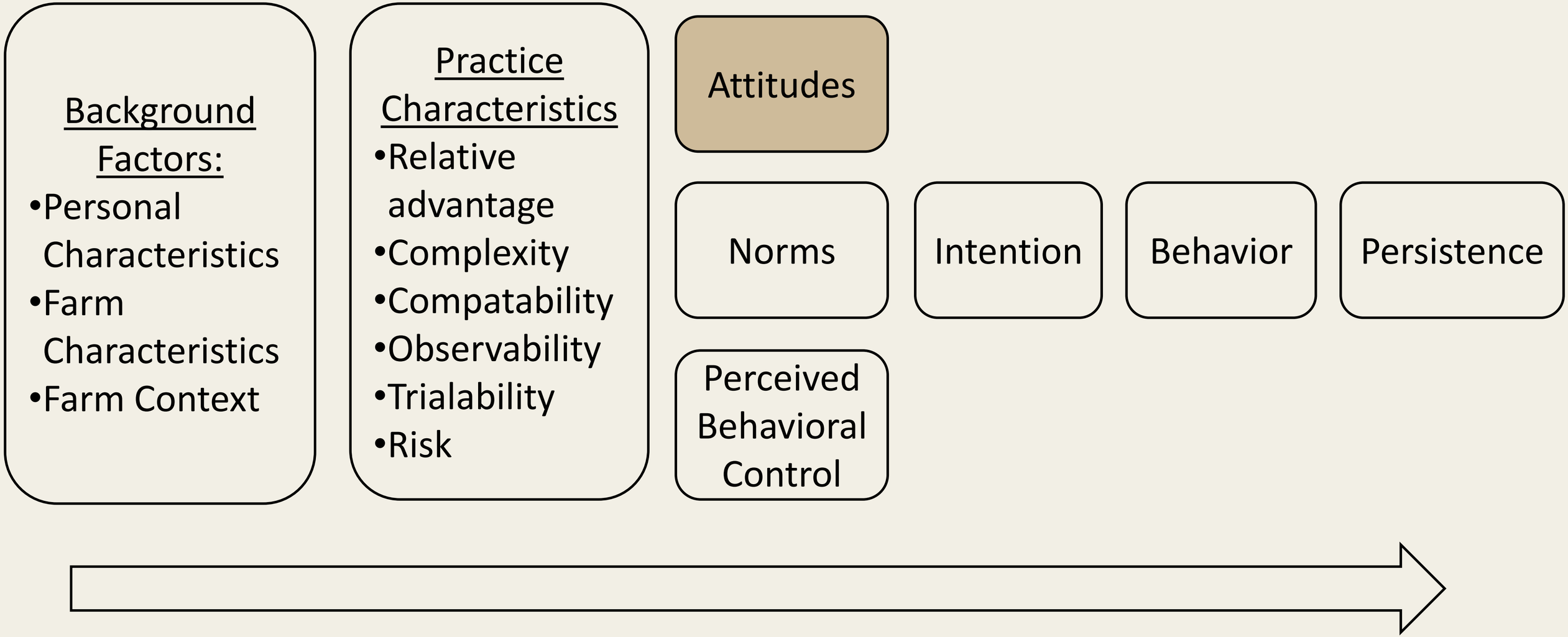
I've never [done] cover crop. I can see some benefits of it. But when you get looking at the financial end of it and then in the interim who's paying for that for the producer and reduction in yields or whatever?

We've all identified that, when you need to put cover crop on, if it's after harvest, it's … not everybody has that time.

You're talking about yield…So if you lose one year, you have one year down, that's not just a one-year problem, let's say it's only 10 bushels that you dropped your 10-year average down one bushel. So that would be an issue for me because…so now you're just not only getting a risk of investing in the cover crop, now you're also losing your yield. So that's not just a one-year problem, that's a 10-year problem.

If you're talking [about] cover crops…It's a timing thing…you get such small windows of time where you can do something that's a positive thing rather than a negative thing. I don't know how you throw that [cover crops] into the mix when you're trying to just take care of business.

Sources: Upper right from Roesch-McNally et al. 2017; others from Ranjan et al. 2020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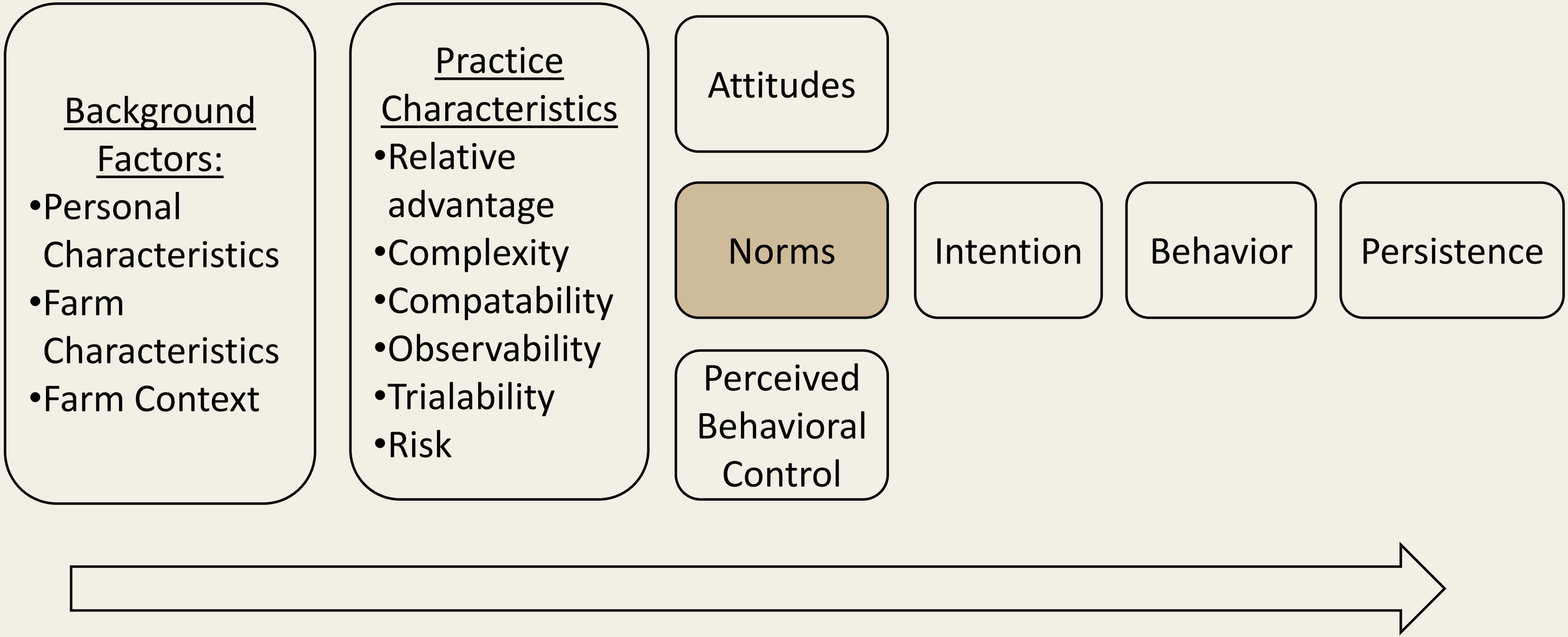
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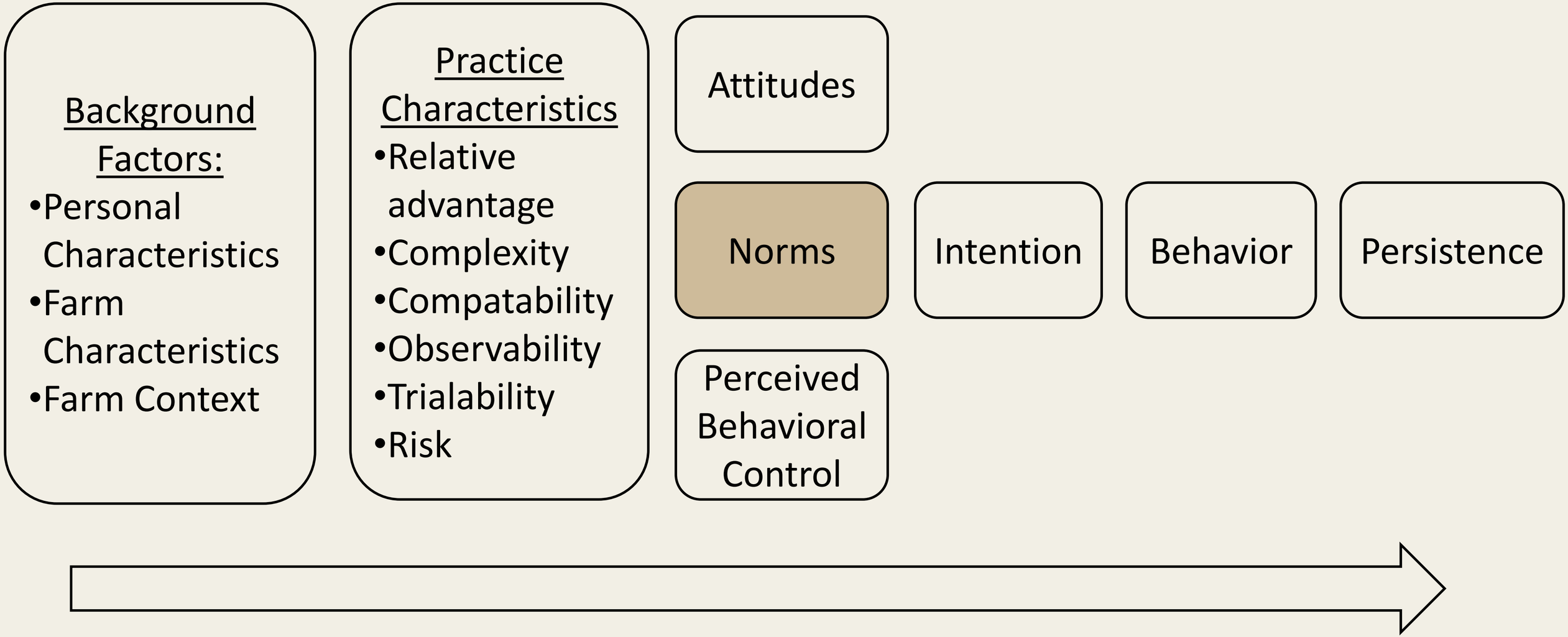
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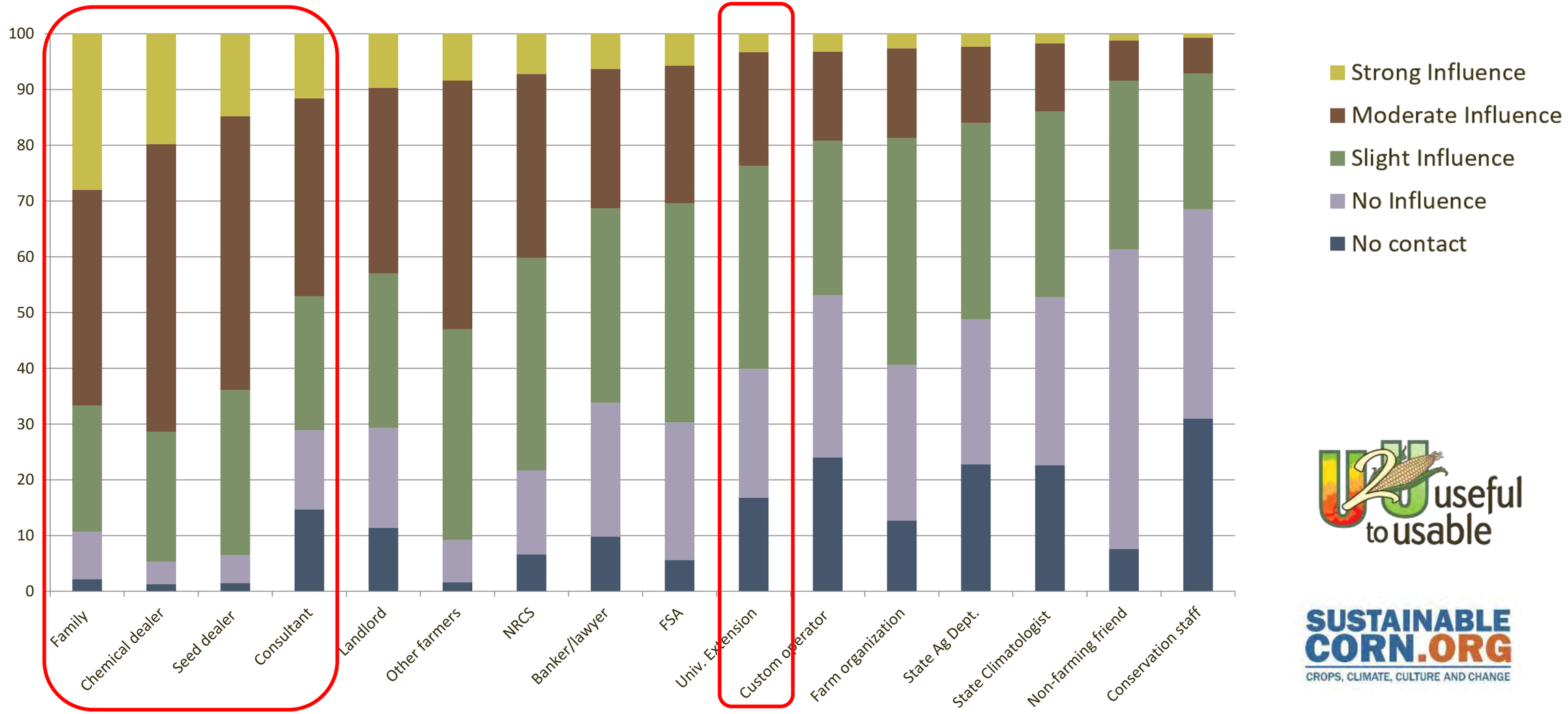
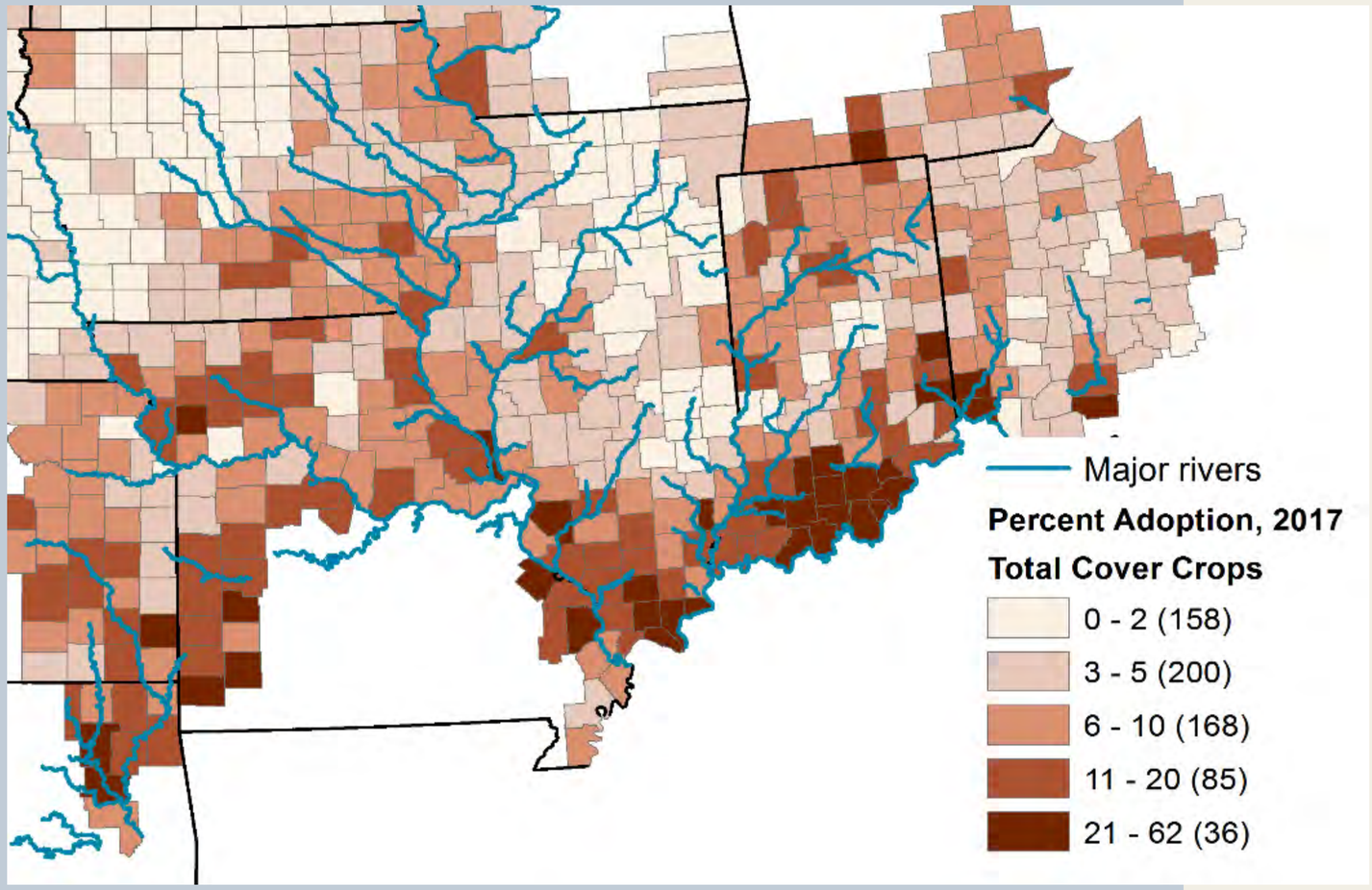
Q: Please indicate how influential the following groups and individuals are when you make decisions about agricultural practices and strategies



Source; Davidson et al. 2015, *Journal of Environmental Quality;* Prokopy et al. 2015 *Climatic Change*



What explains variation in county-level adoption rates?

Popovici et al., 2023

The Nature Conservancy
Protecting nature. Preserving life.®

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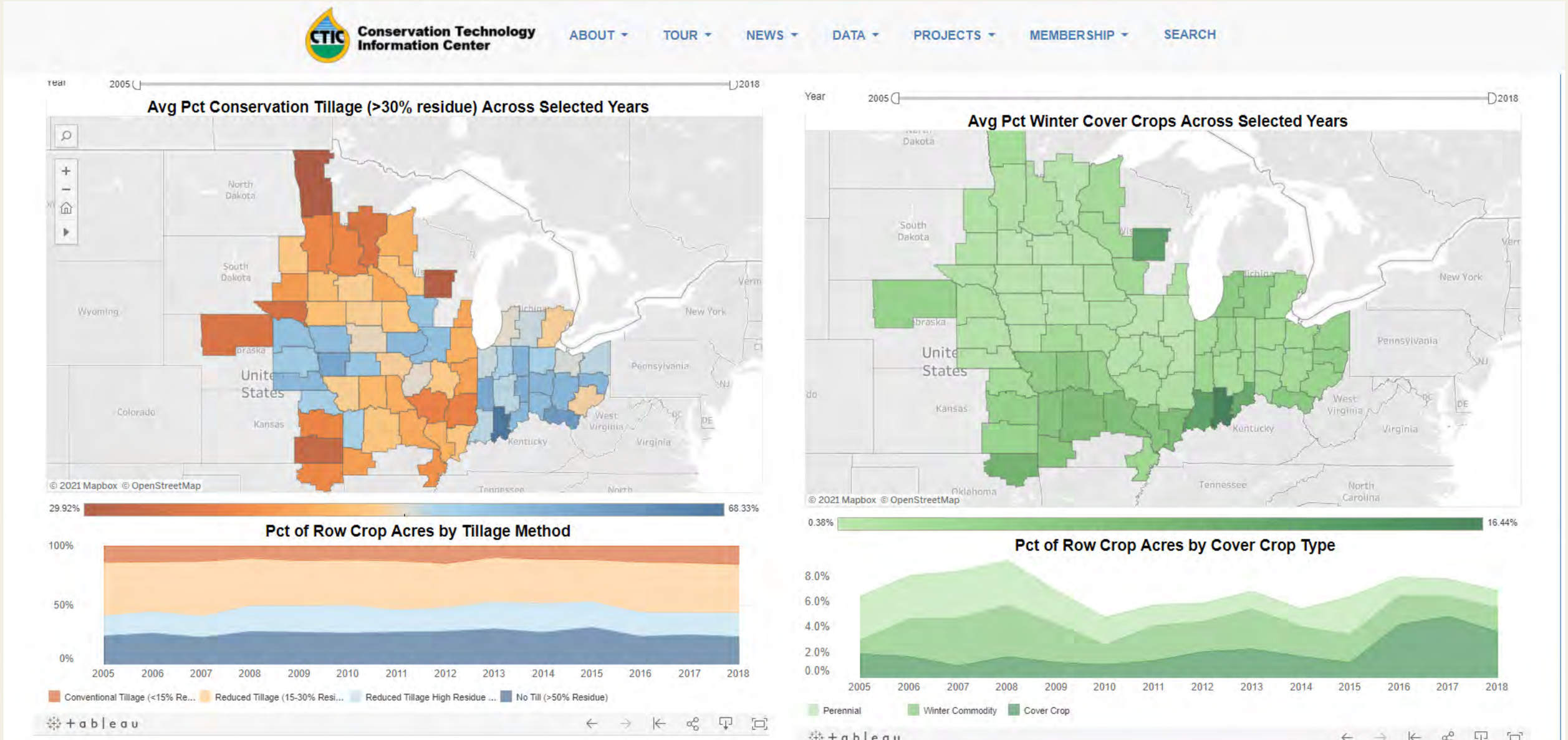
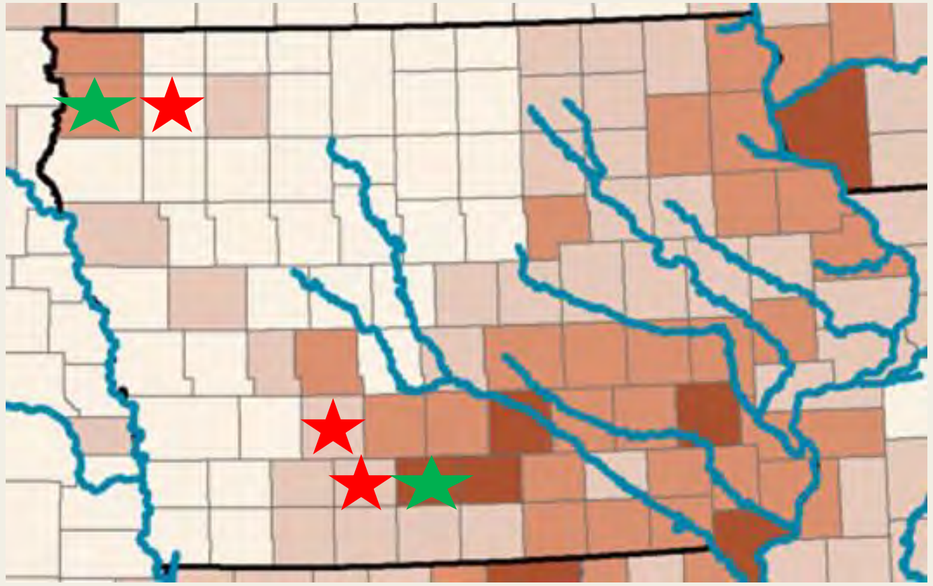
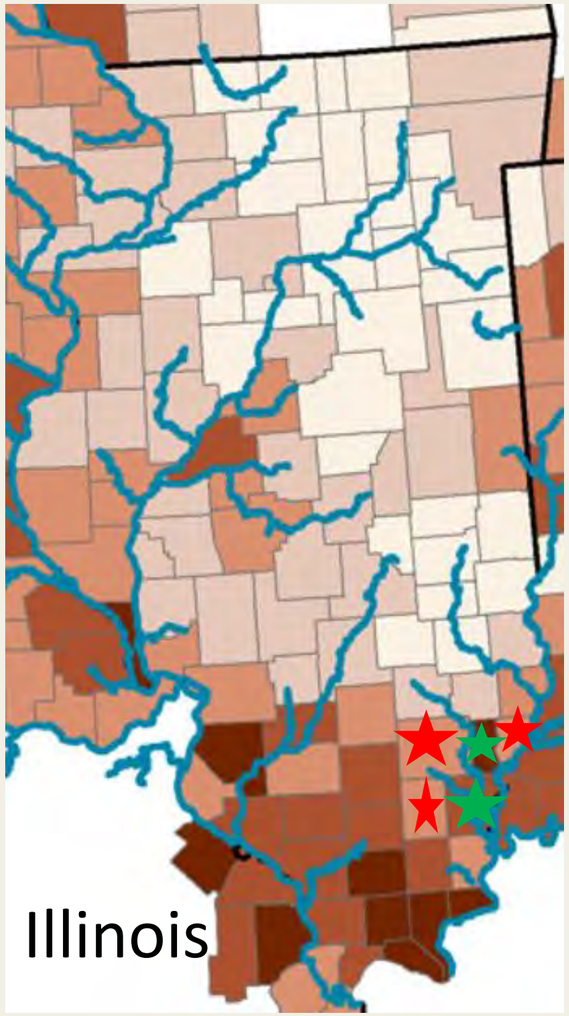
Optis Data (ctic.org/optis)



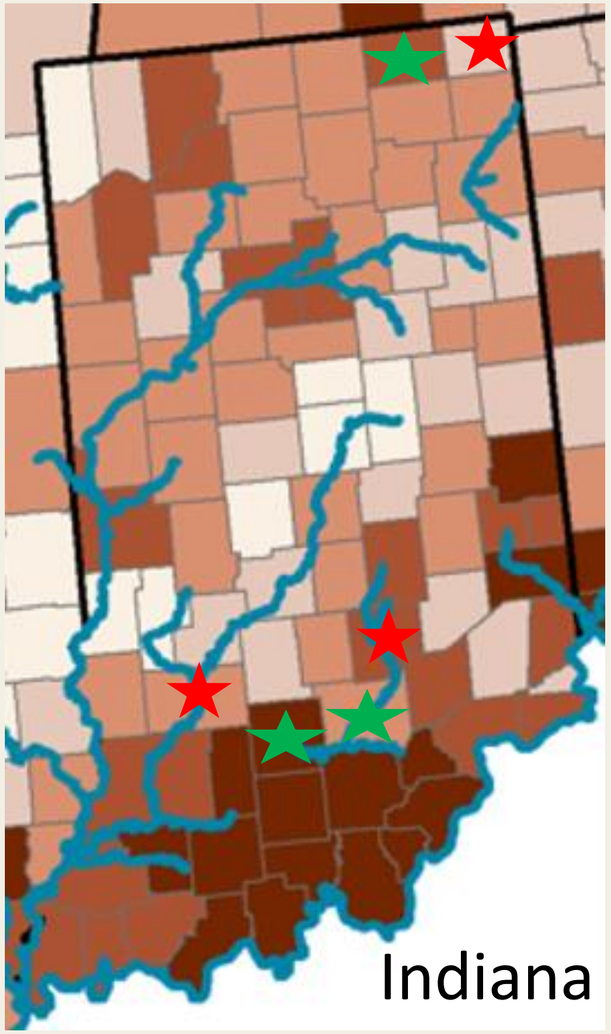
Counties selected



Iowa



Illinois



Indiana

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Factors Contributing to Increased Cover Crop Adoption

	IOWA					ILLINOIS					INDIANA					
Factors	Clarke	Adair	Union	Sioux	O'Brien	White	Wayne	Hamilton	Edwards	Wabash	Lawrence	Greene	Jackson	Bartholo-mew	LaGrange	Steuben
Presence of CC experts, advocates, and/or entrepreneurs	x	x	x	x	x	x	x	x	x	x	x				x	
Favorable attitudes towards CCs	x			x		x	x	x	x		x				x	
Agency employees (NRCS, SWCD, Farm Bureau, Extension, etc.) are promoting CCs beyond their regular duties	x		x	x		x			x		x	x	x	x		x
Collaboration between agencies and CC experts, advocates and/or entrepreneurs	x			x		x			x		x		x		x	
Topography (rolling hills and more erodible soil led to early adoption of CCs)				x		x			x		x				x	
Farm characteristics (more cattle, organic produce, pastured livestock and/or smaller-scale farms)				x					x		x				x	

Note: The counties that are highlighted in gold are the high CC adopters in their respective pairs.

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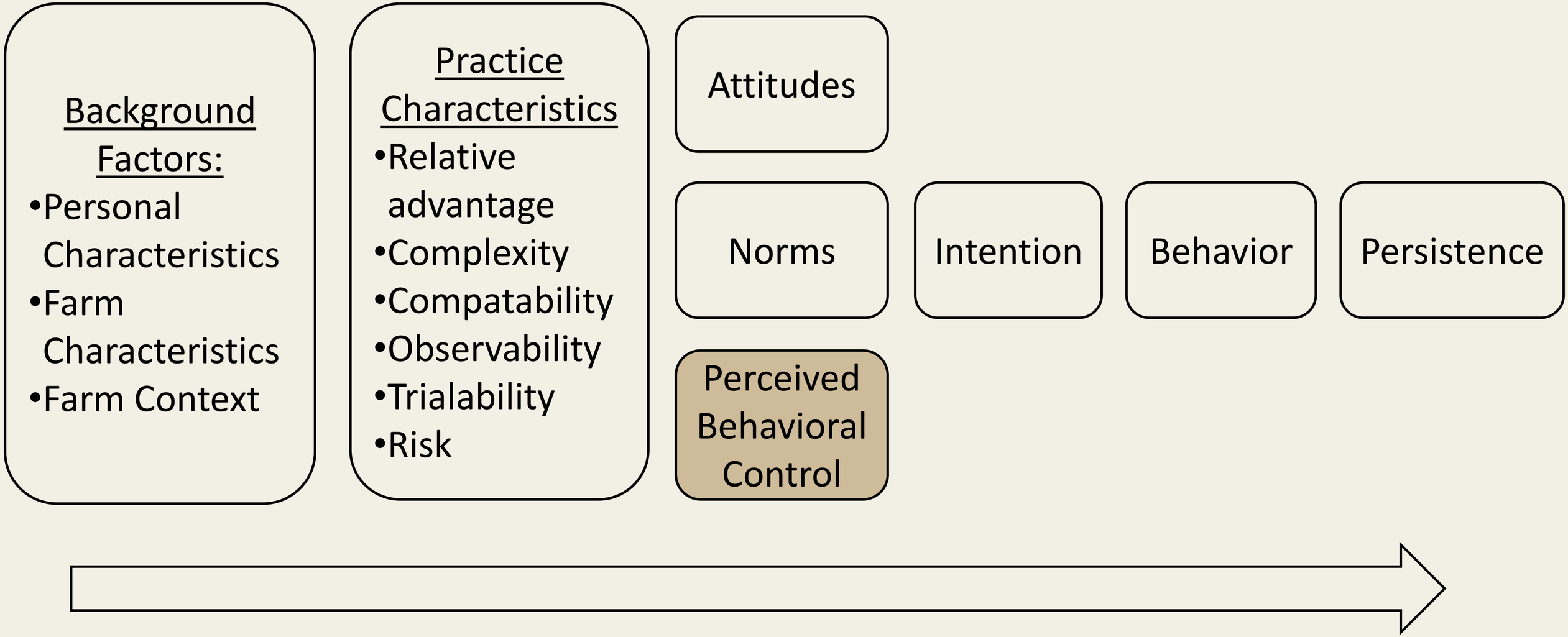
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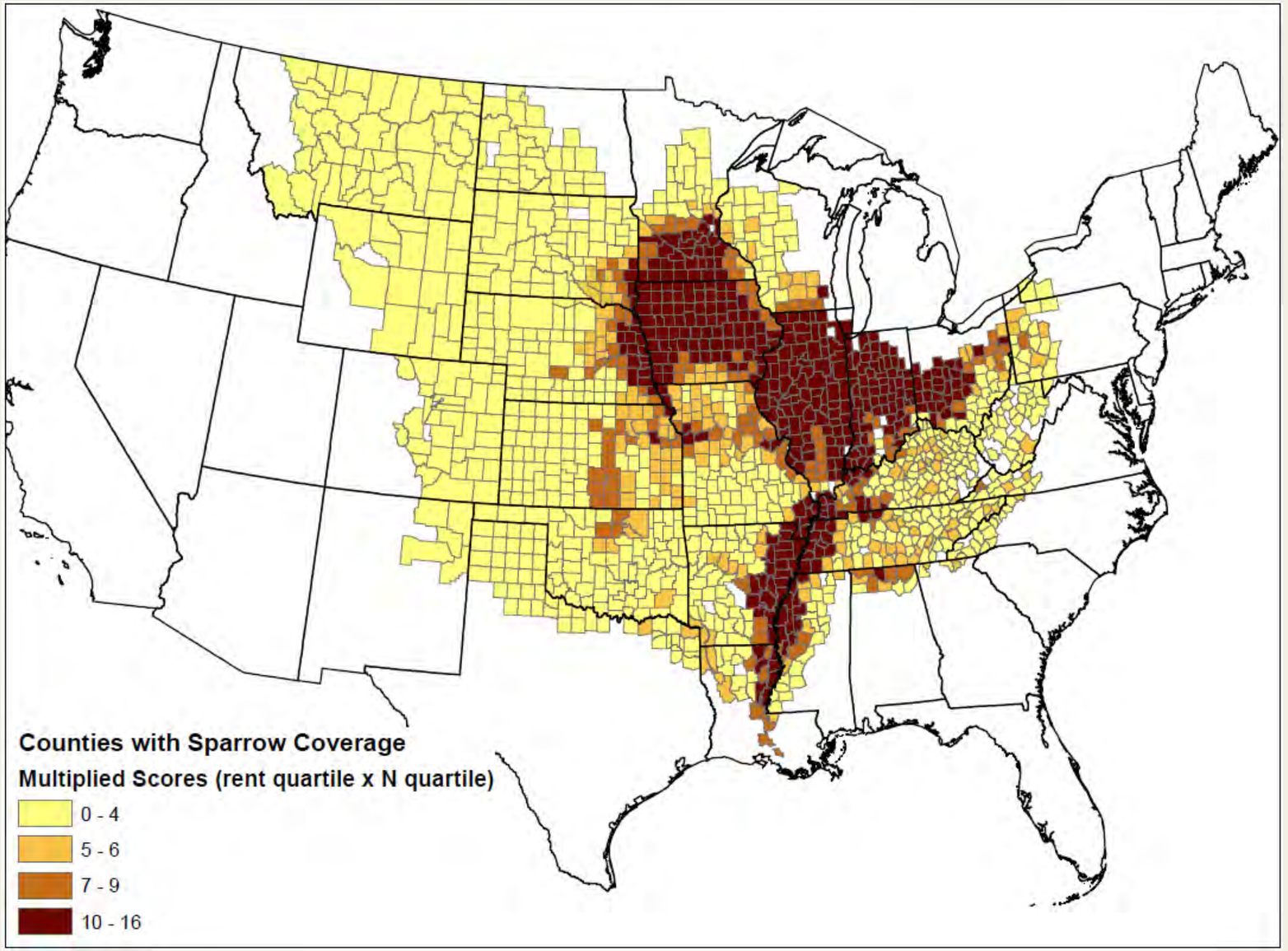


Masuda et al. 2021. Rented farmland: A missing piece of the nutrient management puzzle in the Upper Mississippi River Basin? Journal of Soil and Water Conservation.

Enrolled 2,223 landowners controlling 560k acres of crops randomized into main experiment.

"Yes, I want to learn more about soil health"

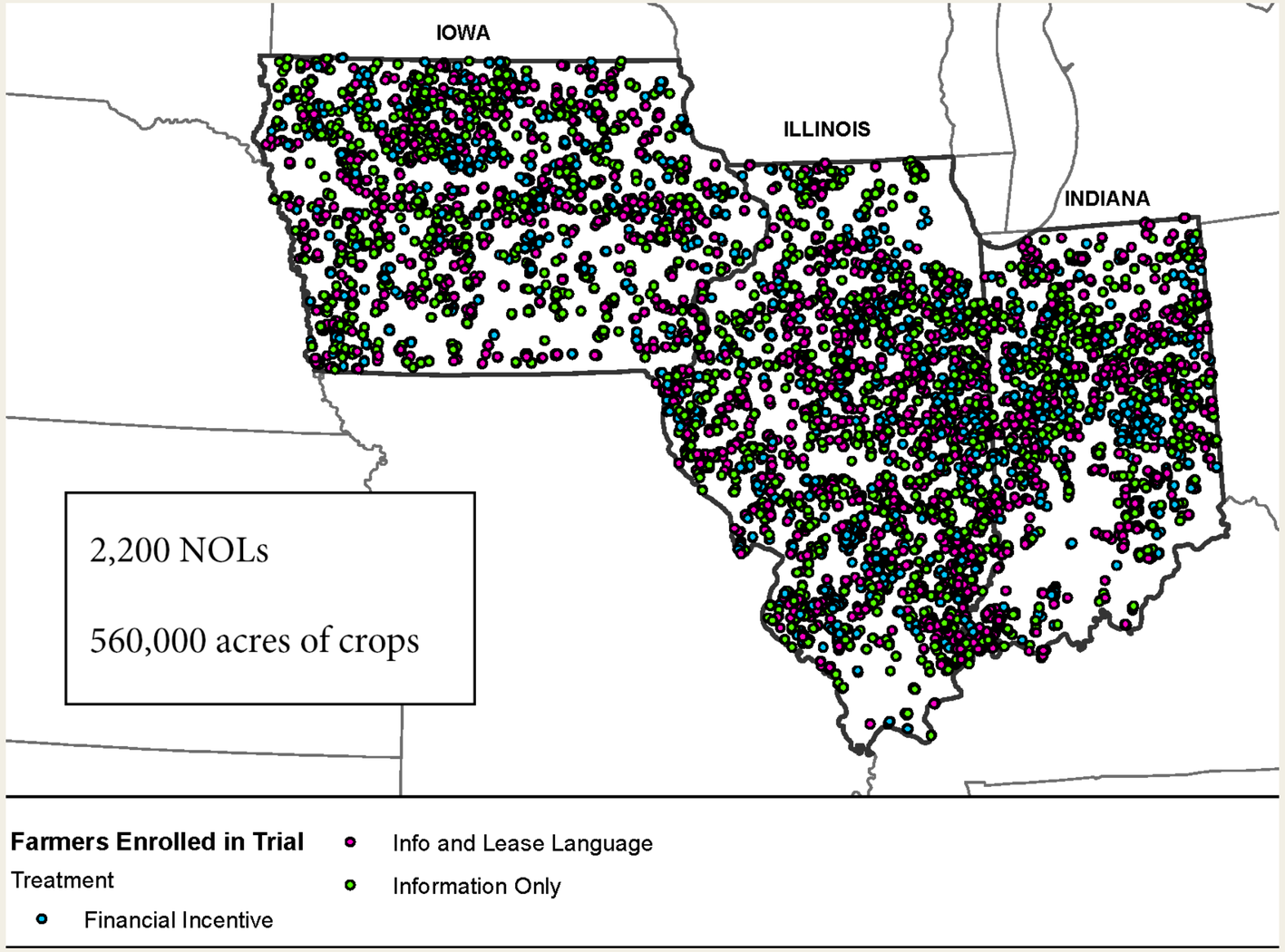
Our sample:

- 2,223 non-operator landowners
- Report not using cover crops in last three years

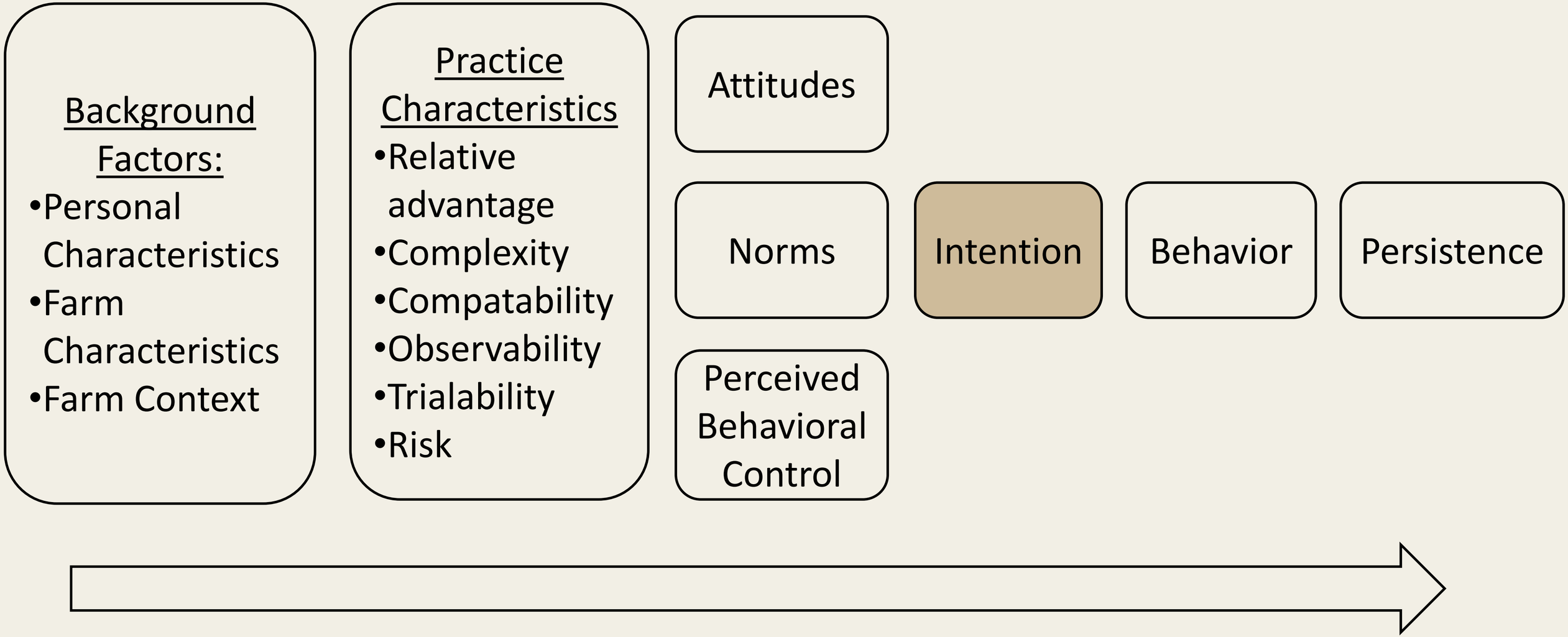
Treatment:

- 876 Information
- 868 Lease
- 479 Financial

1.5% uptake of financial offer



Source: Weigel et al., 2021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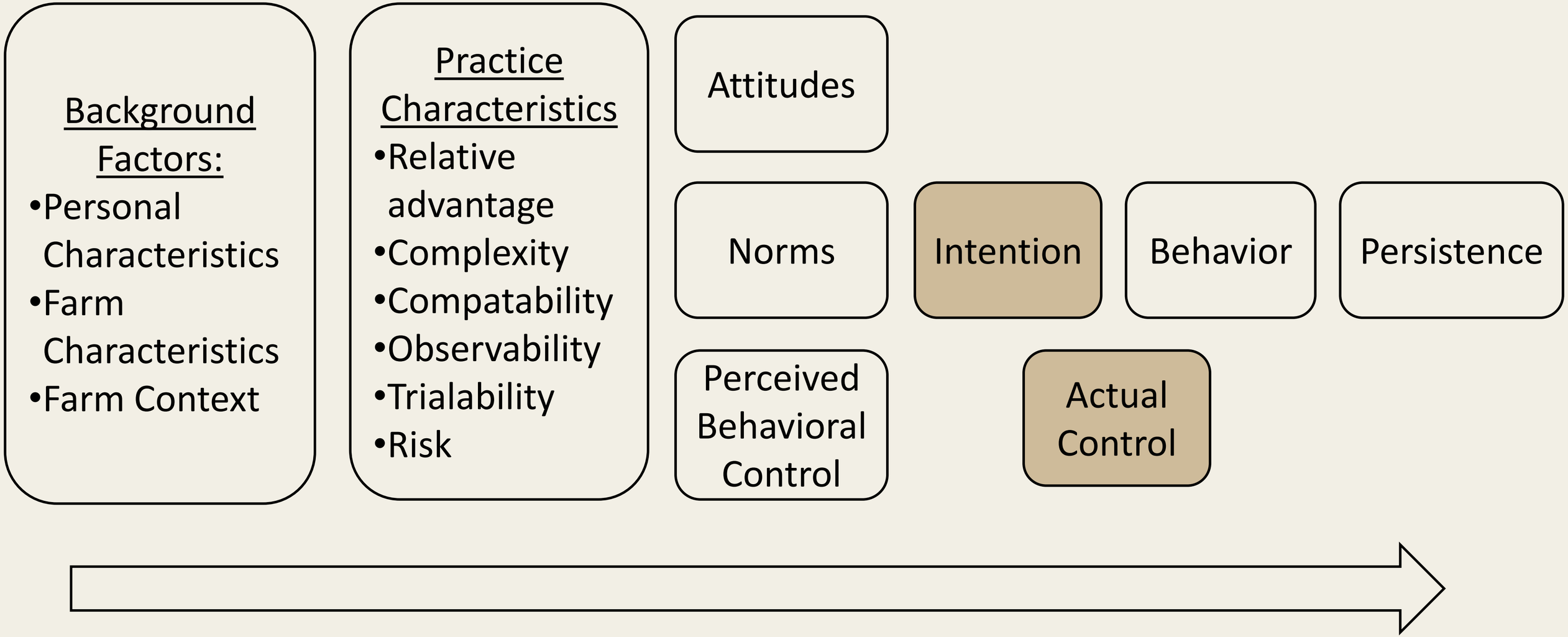
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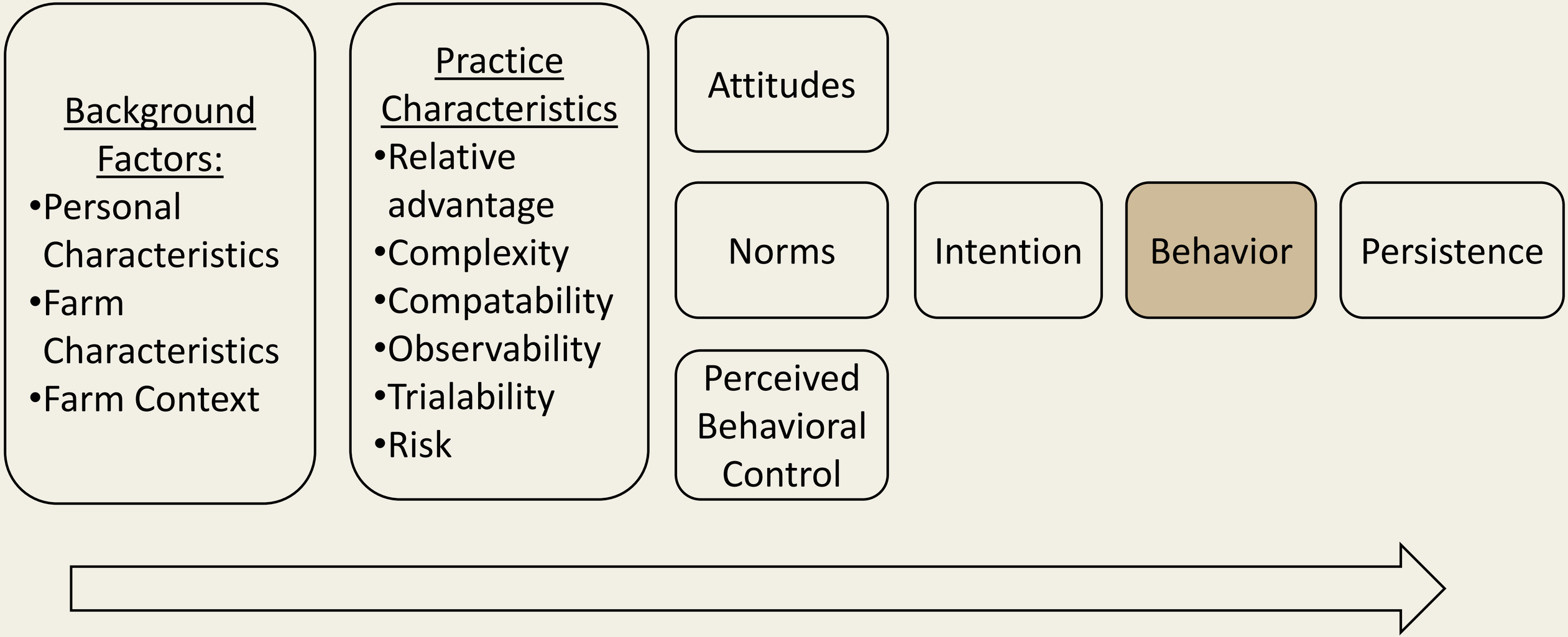
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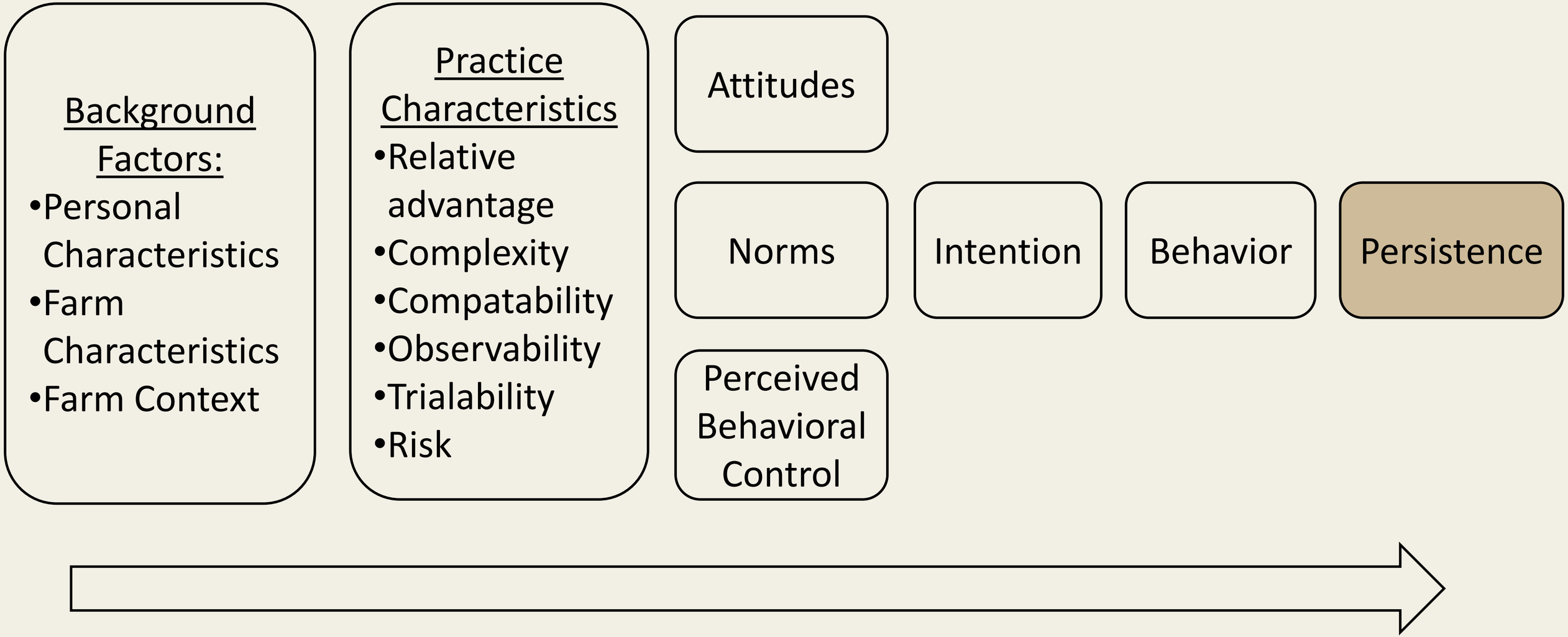
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But, Linda, you didn’t talk about…

Financial incentives

Knowledge

#Diverse Corn Belt:

Enhancing Rural Resilience Through Landscape Diversity in the Midwest

Project Director: Linda Prokopy, Purdue University

USDA-NIFA Grant no.: 2021-68012-35896

www.DiverseCornBelt.com

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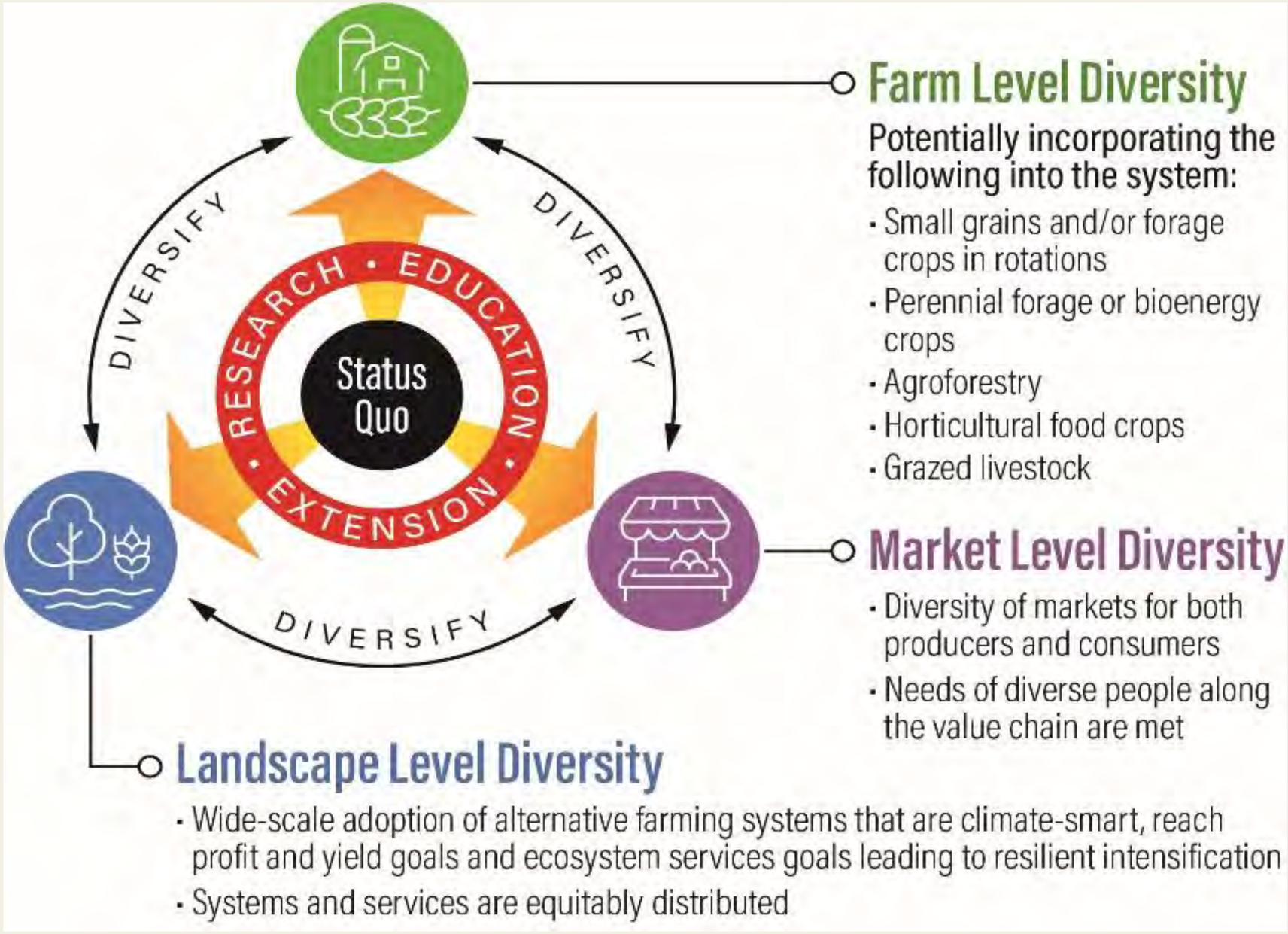
DIVERSIFY
DIVERSIFY
DIVERSIFY
RESEARCH • EDUCATION • EXTENSION
Status Quo
Farm Level Diversity
Potentially incorporating the following into the system:
• Small grains and/or forage crops in rotations
• Perennial forage or bioenergy crops
• Agroforestry
• Horticultural food crops
• Grazed livestock
Market Level Diversity
• Diversity of markets for both producers and consumers
• Needs of diverse people along the value chain are met
Landscape Level Diversity
• Wide-scale adoption of alternative farming systems that are climate-smart, reach profit and yield goals and ecosystem services goals leading to resilient intensification
• Systems and services are equitably distributed

Rogers' Diffusion of Innovations curve

Thank You!

Linda S. Prokopy

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