When is Manure the Right Solution for Cropping Systems?

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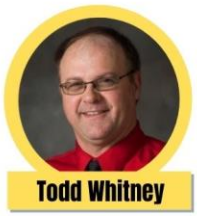
ANIMAL MANURE MANAGEMENT TEAM



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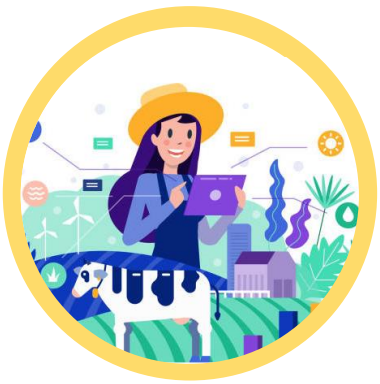
Animal Manure Management Team Objectives

- Build awareness about the value of manure.
- Demonstrate benefits of manure via on-farm research and demonstrations.
- Increase confidence among crop farmers in identifying fields likely to derive the greatest value from manure.

Our Shared Goal…



Deciding whether or not manure is the right solution for your business is based on your individual needs.

Nutrient Management

A complete fertility program that incorporates all available nutrients, including manure

Integrated Pest Management

Innovative pest control and preemptive strategies that help maximize yield while protecting the environment

Water and Soil Management

Maintaining the balance between water conservation and optimal production by understanding the relationship between soil and water properties

Crop Management

Production of healthy, cost efficient and environmentally sound crops and livestock

Manure's Role in Nutrient Management

A complete fertility program that incorporates all available nutrients, including manure

Research shows that when equivalent rates of nutrients are applied as manure or commercial fertilizers, nutrient losses from manure applications are similar or below those associated with chemical fertilizers.

Manure's Role in Nutrient Management

A complete fertility program that incorporates all available nutrients, including manure

Adding mulch, cover crops and/or compost increases soil organic matter, populations of beneficial soil microbes and amounts of active soil carbon and nitrogen available to plants.

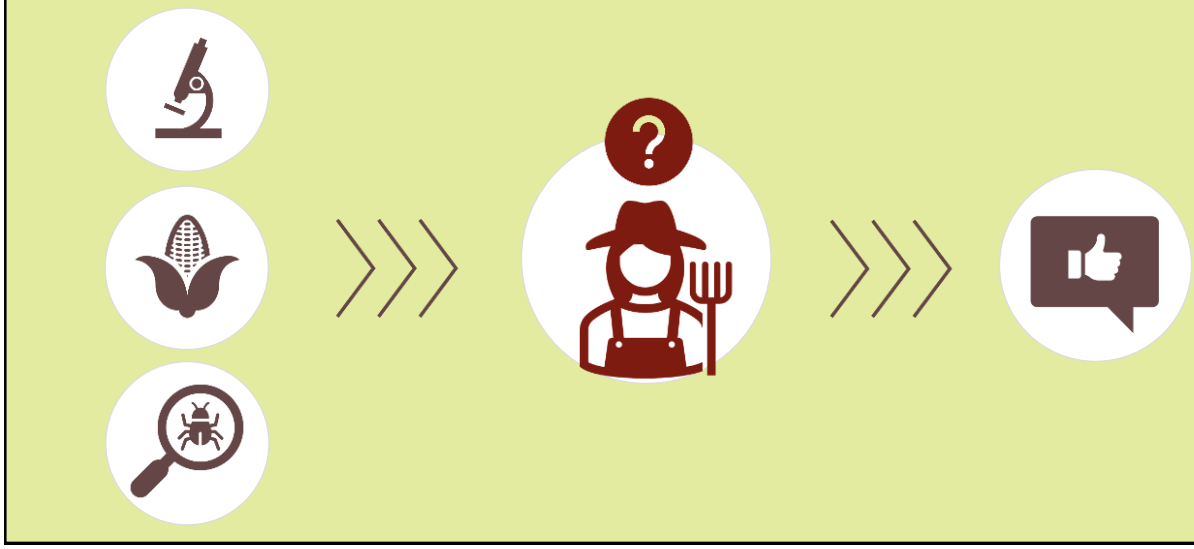
Manure's Role in Pest Management

Innovative pest control and preemptive strategies that help maximize yield while protecting the environment

Good soil management can improve water storage, drainage, nutrient availability and root development, all of which may, in turn, influence crop-defense mechanisms and populations of potential beneficials and pests.

Altieri et al. 2005.

Measuring & Demonstrating Soil Biological Properties



Arthropod Evaluation

- Soil cores from 0-20 cm
- Burlese Funnel extraction for one week
- Specimens classified and quantified
- Ecomorphological Index (EMI) assigned
- QBS Score calculated

Acari (mites)	Collembola	Symphyla
		
Contribute directly or indirectly to soil processes like nutrient cycling, soil formation, and pest control	Impact soil macroaggregation Higher acari:collembola = better soil quality and habitat stability	Feed on plant roots; can be a major pest if population not controlled by other organisms
Identified in all samples, but significantly greater mean abundance in SSW	Greatest ratio of acari:collembola observed in SSW	Lowest mean abundance in SSW < SS < CON

Manure's Role in Pest Management

Innovative pest control and preemptive strategies that help maximize yield while protecting the environment

A combination of manure and woodchips seems to positively impact soil biology by supporting proliferation of "good" soil organisms that outcompete "bad" soil organisms.

Altieri et al. 2005.

Manure's Role in Pest Management

Fertilizer practices can influence plant defenses.

A review of 50 years of research identified:

> plant damage and/or number of leaf-chewing insects in inorganic N-fertilized crops

< plant damage and/or number of leaf-chewing insects in inorganic N-fertilized crops

Manure's Role in Water and Soil Management

Maintaining the balance between water conservation and optimal production by understanding the relationship between soil and water properties

"As a rule, ecosystems with more diversity tend to be more stable: they exhibit greater resistance — the ability to avoid or withstand disturbance — and greater resilience — the ability to recover from stress."

Manure's Role in Water and Soil Management

Greater soil aggregate stability resulting from soil biological activity that is fueled by organic amendments can reduce runoff and erosion (e.g. non-point source pollution).

Organic N in manure is less prone to leaching than inorganic N in fertilizer.

Manure's Role in Crop Management

Production of healthy, cost efficient and environmentally sound crops and livestock

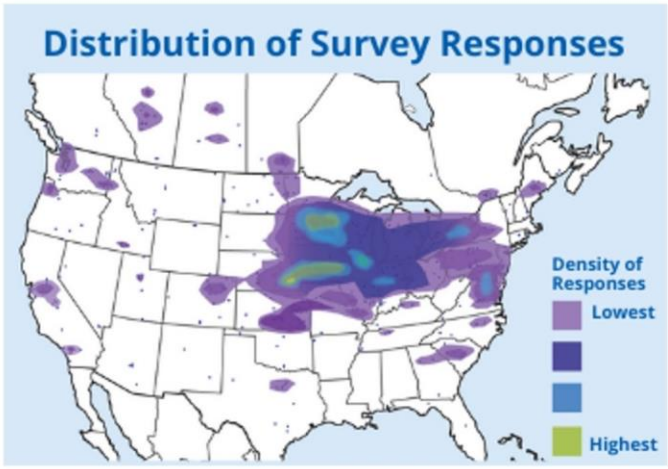
There are excellent opportunities to make money with manure as fertilizer by closely linking livestock production facilities with nearby row crop production ground.

In a Missouri assessment, a 4800-hd grow finish hog operation using modern diets could meet the fertilizer needs of two sections of land in a corn-soybean rotation with manure while increasing net income at least $25,000 with a return on assets greater than 15%.

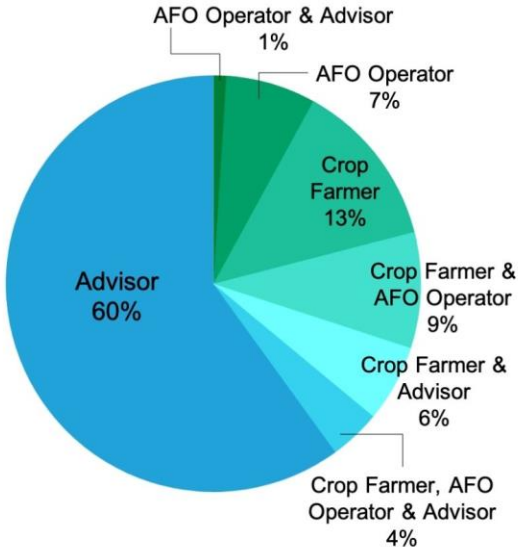
Manure's Role in Crop Management

What do audiences understand and value as benefits of and barriers to manure use?

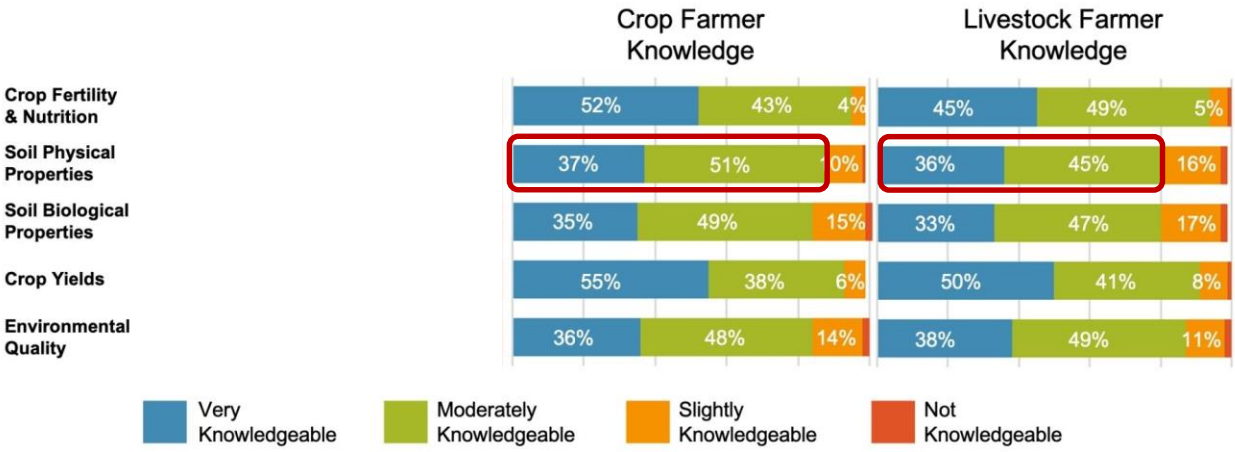
RESPONDENT DEMOGRAPHICS



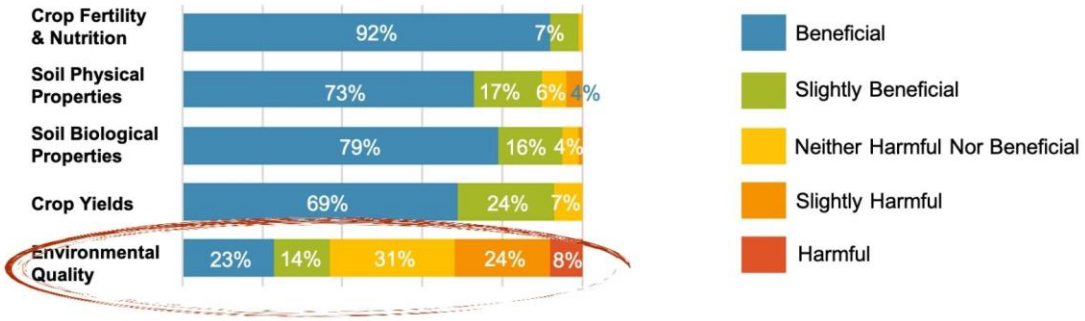
957 Responses



WHO'S IN THE KNOW?



MANURE: HARMFUL OR HELPFUL?

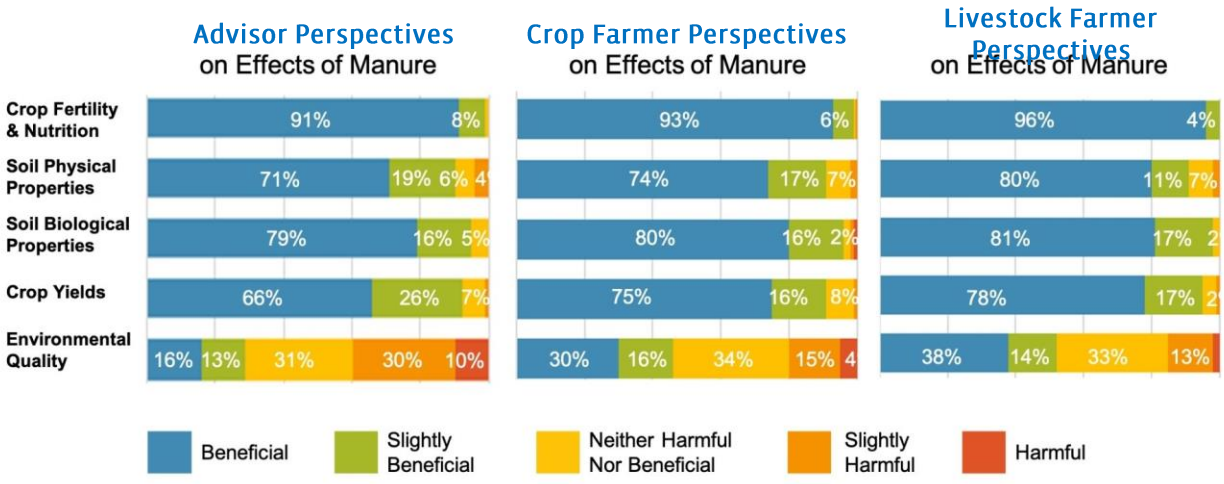


Among farmers and/or advisors, **99%** believe manure is at least slightly beneficial to crops.

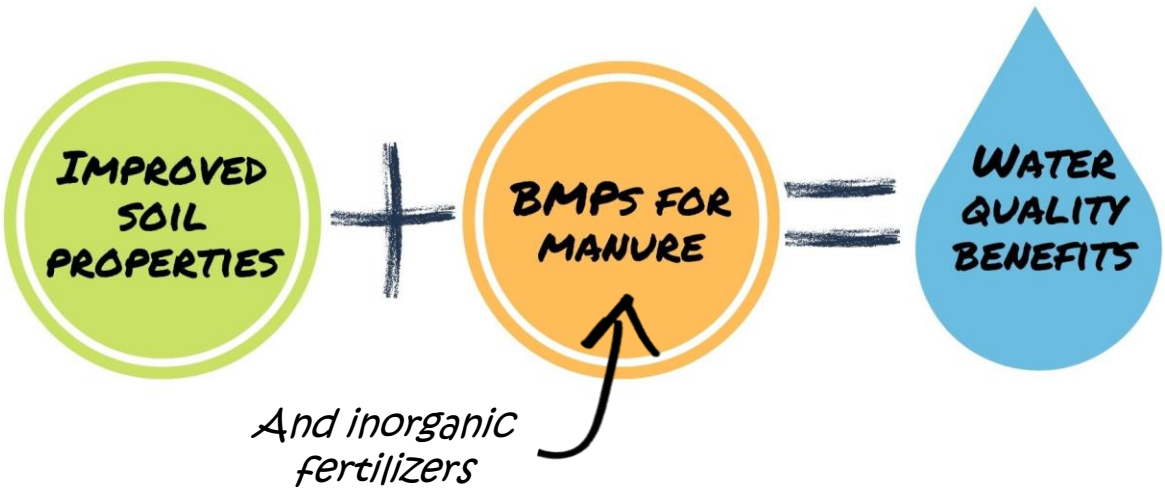
The majority also believe manure benefits "soil health" characteristics and crop yields.

Opinions about manure impacts on environmental quality were varied.

MANURE: HARMFUL OR HELPFUL?



Bridging the Gap



CAN MANURE & FERTILIZER WORK TOGETHER?

- Complement each other **70%**
- Rarely compete or complement each other **12%**
- Compete – fertilizer is preferred **9%**
- Compete – manure is preferred **8%**

Among farmers and advisors who regularly use or recommend fertilizer, **the majority believe manure and fertilizer complement each other**.

TOP 10 CHALLENGES TO MANURE USE IN CROP SYSTEMS

1. Transportation & application costs
2. Odors
3. Timeliness of application
4. Field conditions limiting application
5. Time/labor requirements
6. Equipment compaction
7. Poor application uniformity
8. Regulation of manure
9. Weed seeds introduced by manure
10. Initial costs for adding manure

Key Messages

Manure positively impacts soil resistance — the ability to avoid or withstand disturbance — and resilience — the ability to recover from stress.

When used according to best management practices, manure reduces risks of erosion and runoff of contaminants to surface water.

The body of research supports the assertion that organic fertilizers reduce pest risks more than inorganic fertilizers.

Manure Happens.

The UNL Animal Manure Management Team wants to help farmers make the most of it.

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