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University of Nebraska-Lincoln Extension in Gage County  
Paul Hay, Extension Educator • 1115 West Scott Street • Beatrice NE 68310 • (402) 223-1384  
website: <http://gage.unl.edu> • email: [phay1@unl.edu](mailto:phay1@unl.edu)  
<http://www.facebook.com/UNLExtensionGageCo> • <https://twitter.com/#!/UNLExtensionGage>

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Paul C Hay  
Extension Educator  
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### CAN MANURE MANAGEMENT BE A WIN-WIN

Manure and Soil Health: What is the State of the Science? Can manure be both an economic ‘Win’ and an environmental ‘Win’? What fields provide the best opportunity for Win/Win? What exactly are the environmental and soil health wins associated with manure? Can we test soils so that we have more understanding of the value of manure nutrients and carbon? What are the biological processes in a soil system that benefit from organic fertilizers? These and other questions are the topics a new University of Nebraska working group addressing Manure and Soil Health (MaSH) plan to address. Rick Koelsch, University of Nebraska-Lincoln; Shelby Burlew, Michigan State University; Mary Berg, North Dakota State University are part of this North Central region working group.

United States agriculture has transitioned in the last two generations. What were mixed livestock and grain farms are now larger focused production units for crops or livestock. Many crop farmers have not utilized and experienced the benefits of manure, because it was not available. The art and science of recycling manure nutrients and carbon has changed, in part, due to the availability of inorganic fertilizers. The recent Confined Animal Feeding Operation regulation of manure management has reacquainted many farms with manure’s nitrogen (N) and phosphorus (P) value and risks. Recycling manure N and P in crops is increasingly valued in most agricultural areas and increasingly is highly valued and sought after.

The carbon in manure is a beneficial element for soils, leading to greater water infiltration, less runoff and erosion, and improved soil drought tolerance. Manure applications to cropland and pastures provide key nutrients like nitrogen, phosphorus, potassium, zinc and sulfur. Beyond that on cropland manure will increase yields another 7 bushels/A on corn and 2 bushels/A on soybeans. No-till farming with manure applications adds 1.5 to 2 percent organic matter to the soil. This not only stores and cycles nutrients, but also holds 30,000 to 40,000 gallons of water per acre for summer crop use. This adds yields on dryland and reduces irrigation costs on irrigated land.

The value of manure’s carbon (or organic matter) still carries mysteries to many managers of crop and soil systems. The carbon in manure is a beneficial element for soils, leading to greater water infiltration, less runoff and erosion, and improved soil drought tolerance. These advantages are generally connected with changes in soil structure including greater aggregation of soil particles. In addition, manure’s properties benefit soil pH, diversity of soil organisms, disease suppression, and cycling of soil nutrients.

This working group of Land Grant University and NRCS professionals has formed a Manure and Soil Health team for the purpose of encouraging a better understanding of the value of manure. With some start up support from the [North Central Region Water Network](#), our group proposes to: 1) summarize the current state of knowledge on the role of manure in soil health

- 2) distribute this knowledge to those influencing manure and soil management decisions
- 3) identify future research and education needs to advance our knowledge.

For more information e-mail Paul C Hay at [phay1@unl.edu](mailto:phay1@unl.edu), call 402-223-1384, or visit the News Column University of Nebraska Extension local Website: [gage.unl.edu](http://gage.unl.edu), Twitter: @Cloverhay

Paul C Hay  
University of Nebraska – Lincoln  
Extension Educator  
1115 West Scott St. Beatrice, NE 68310  
[Phay1@unl.edu](mailto:Phay1@unl.edu) 402-223-1384

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