

Carney Family Farms Maxwell, IA





Trials

Project Title	Year
Comparison of Stocker Gains from Grazing Different Forages	2009
Soil Quality Indicators Among Different Farming Systems	2010
Comparison of Steady State Water Infiltration Rates Among Farming Systems	2010
Monitoring Winter Cattle Diets	2011
Grazing Cover Crops on Corn Ground	2014
Improving Cool-Season Pastures with Interseeding Annuals and Grazing	2014-2016
Tile Water Monitoring	2015-2016
Demonstrating Economic and Soil Health Benefits of Grazing Cover Crops	2015-2018
Pasture Management and Carcass Quality	2015-2018
Monitoring Birds in Rotationally Grazed Pasture	2016-2017

Monitoring Birds in Rotationally Grazed Pasture



Livestock Research



Monitoring Birds in Rotationally Grazed Pasture, 2017 Update

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Funding By:

The National Fish and Wildlife Foundation

Web Link:

<http://bit.ly/pfilivestock>

In a Nutshell

- Wild bird populations can thrive in properly managed working landscapes.
- Cattle activity changes grassland structure; creating areas with short and tall vegetation, which provides habitat that is less available in conservation areas.
- For some species, rotationally grazed pastures have the capacity to support greater bird population sizes compared to conservation areas that are not grazed.
- Prairies and pastures complement one another to protect a wider range of birds than either habitat alone.

Key findings

- Restored prairie in a conservation area supported 285 birds (21 species) in 2016 and 230 birds (25 species) in 2017.
- Rotationally grazed perennial pasture





Table 1**Bird Species Ranked From Most Abundant to Least Abundant in 2016**

1	Brown-Headed Cowbird	21	Field Sparrow	41	Yellow-Throated Vireo
2	Cliff Swallow	22	Ring-Necked Pheasant	42	Broad-Winged Hawk
3	Dickcissel	23	Turkey Vulture	43	Eastern Wood Pewee
4	Red-Winged Blackbird	24	Rock Pigeon	44	Northern Cardinal
5	European Starling	25	Warbling Vireo	45	Great Blue Heron
6	Barn Swallow	26	American Crow	46	American Tree Sparrow
7	Eastern Meadowlark	27	Song Sparrow	47	Bald Eagle
8	Grasshopper Sparrow	28	Gray Partridge	48	Lark Sparrow
9	Sedge Wren	29	Le Conte's Sparrow	49	Sandhill Crane
10	Canada Goose	30	Northern Flicker	50	Fox Sparrow
11	Common Yellowthroat	31	Rusty Blackbird	51	Great-Crested Flycatcher
12	Bobolink	32	Common Grackle	52	Nelson's Sparrow
13	Mourning Dove	33	Red-Headed Woodpecker	53	Yellow-Headed Blackbird
14	Killdeer	34	House Finch	54	Baltimore Oriole
15	American Goldfinch	35	House Sparrow	55	Bank Swallow
16	Northern Mockingbird	36	Gray Catbird	56	Cedar Waxwing
17	Tree Swallow	37	Chipping Sparrow	57	Eastern Bluebird
18	Eastern Kingbird	38	Mallard	58	Lincoln's Sparrow
19	American Robin	39	American Kestrel	59	Red-Tailed Hawk
20	Henslow's Sparrow	40	Vesper Sparrow		

Species of special interest in this study listed in bold.

Table 2**Bird Species Ranked From Most Abundant to Least Abundant in 2017**

1	Cliff Swallow	17	American Robin	33	American Crow
2	European Starling	18	Sandhill Crane	34	Great Blue Heron
3	Brown-Headed Cowbird	19	Common Grackle	35	Baltimore Oriole
4	Dickcissel	20	Henslow's Sparrow	36	Song Sparrow
5	Eastern Meadowlark	21	Ring-Necked Pheasant	37	Yellow-Headed Blackbird
6	Red-Winged Blackbird	22	Savannah Sparrow	38	Bald Eagle
7	Barn Swallow	23	Tree Swallow	39	Blue Jay
8	Mourning Dove	24	Field Sparrow	40	Cedar Waxwing
9	American Goldfinch	25	House Wren	41	Northern Harrier
10	Bobolink	26	Mallard	42	Gray Catbird
11	Sedge Wren	27	Turkey Vulture	43	Red-Tailed Hawk
12	Grasshopper Sparrow	28	Eastern Kingbird	44	Rose-Breasted Grosbeak
13	Canada Goose	29	Vesper Sparrow	45	House Sparrow
14	Rock Pigeon	30	Gray Partridge	46	Lincoln's Sparrow
15	Common Yellowthroat	31	Le Conte's Sparrow	47	Northern Cardinal
16	Killdeer	32	Nelson's Sparrow	48	Orchard Oriole

Species of special interest in this study listed in bold.

Bird Monitoring

Figure 1

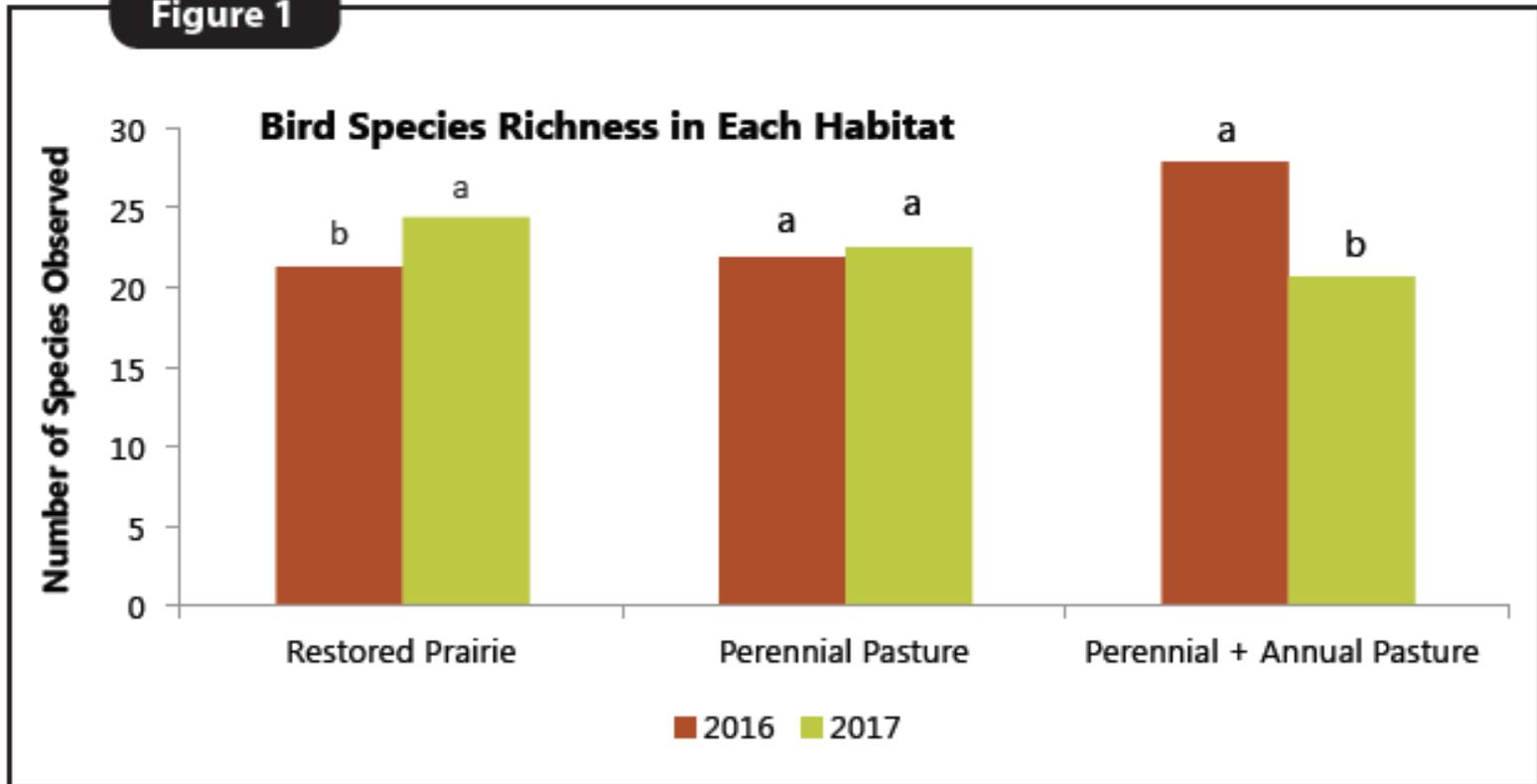


Figure 1. Number of different bird species observed in each habitat type each year. By habitat, columns labeled with different letters are significantly different. At $P < 0.10$, the Restored Prairie had significantly more diverse species than the year prior and the Perennial + Annual Pasture had significantly less diverse species than the year prior.



Bird Monitoring

Figure 2

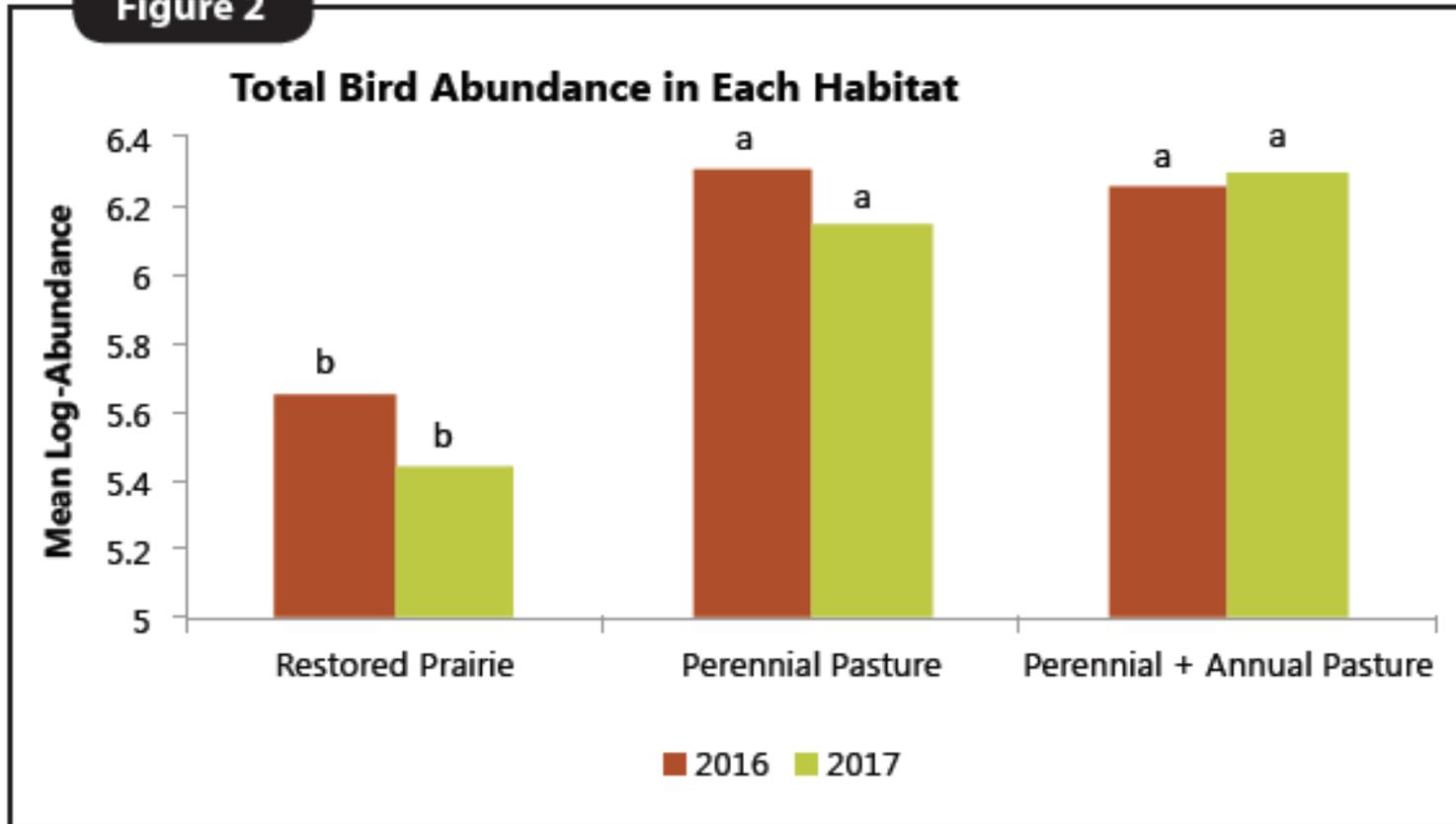
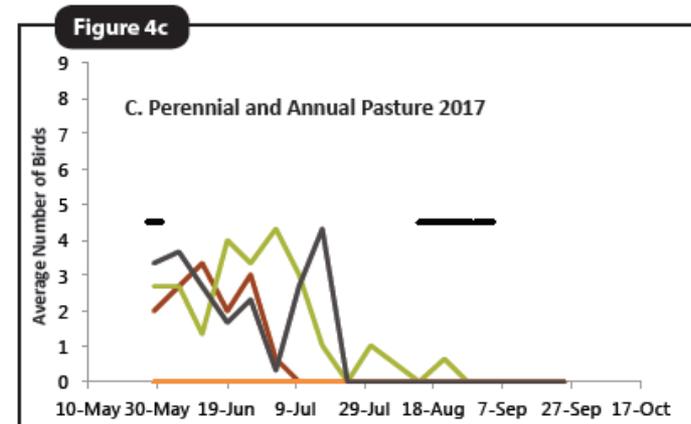
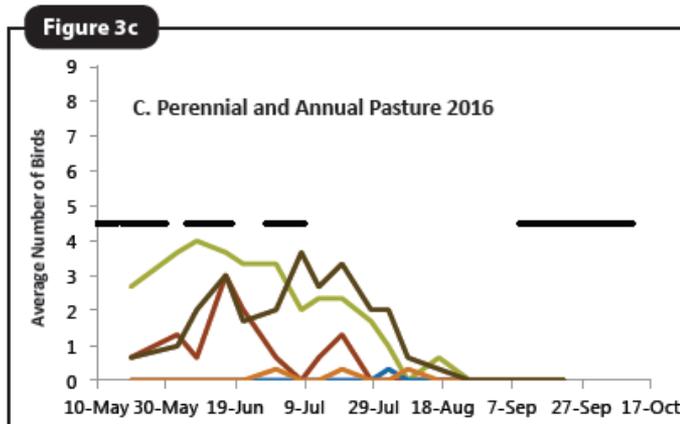
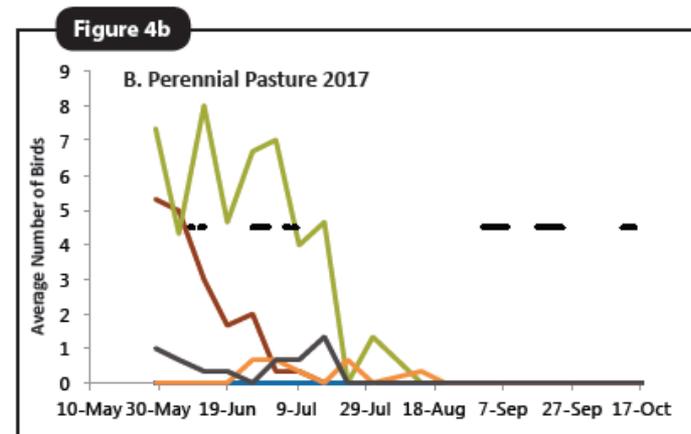
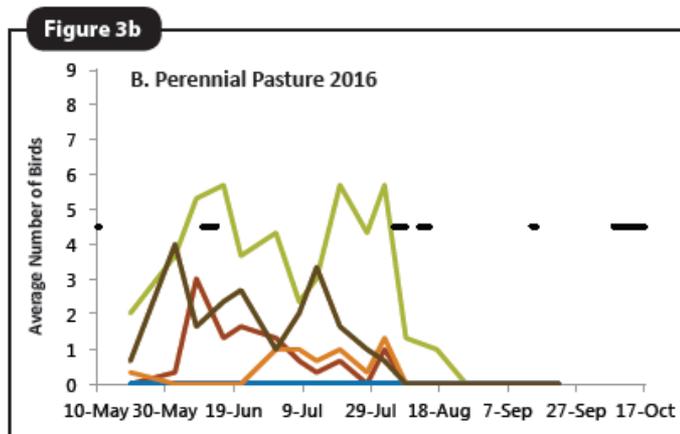
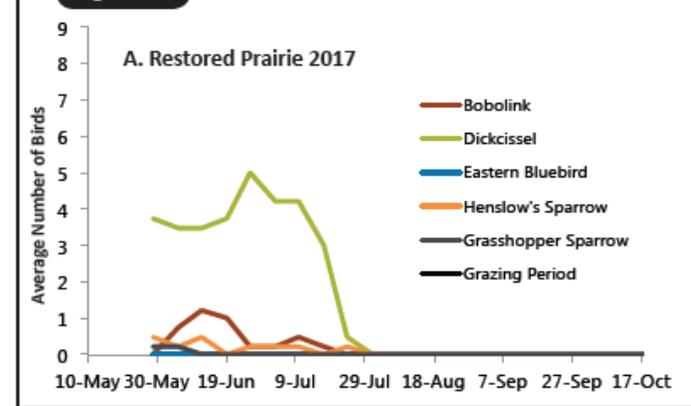
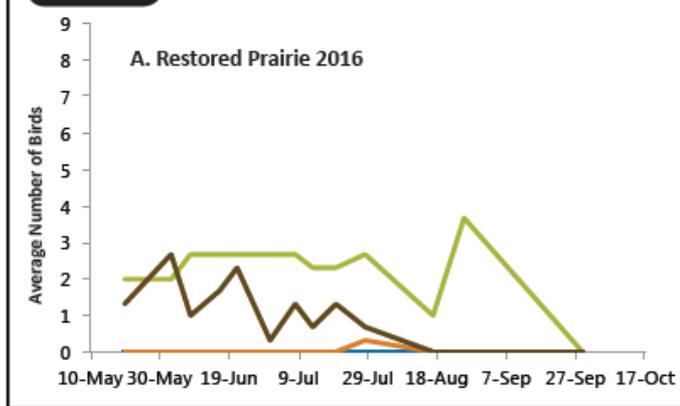


Figure 2. Total number of all bird species observed in each habitat type reported on a log scale. For each habitat type, columns labeled with different letters are significantly different. At $P < 0.05$, more birds were observed in the Perennial Pasture and Perennial + Annual Pasture than Restored Prairie, both years.



Figures 3 and 4. 2016 and 2017 average bird abundance, for the five species of conservation interest, in A. restored prairie, B. perennial pasture, C. perennial + annual pasture. Cattle grazing periods in the pastures are designated by horizontal black lines.



Bird Monitoring

Key findings

- Restored prairie in a conservation area supported 285 birds (21 species) in 2016 and 230 birds (25 species) in 2017.
- Rotationally grazed perennial pasture supported 553 birds (22 species) in 2016 and 468 birds (23 species) in 2017.
- Rotationally grazed perennial + annual pasture supported 524 birds (28 species) and supported 545 birds (21 species) in 2017.
- Pastures better supported some birds that are considered in decline than the restored prairie.

Project Timeline:

May 2016 - September 2016

May 2017 - September 2017

“I learned that you don’t have to have thousands of acres to conserve wildlife. At first, I assumed Chichaqua would have more birds than my farm, but it really comes down to management. Smaller parcels of land, managed properly, can create favorable habitats and support birds.” – Bruce Carney

- Prairies and pastures complement one another to protect a larger population of birds than either habitat alone
- Agriculture and conservation can co-exist



GRAZED ON

Audubon
CERTIFIED

BIRD FRIENDLY
LAND

Soil Health and Economics of Grazing Cover Crop

Objective:

- To demonstrate ways to integrate multiple species of cover crops and cattle grazing into a corn and soybean enterprises
- To quantify soil health benefits and long-term economic value of those benefits to the crop/grazing system.

Methods

- Plant diverse cover crop mix

red clover - hairy vetch - cereal rye - spring barley - mustard - turnip

- Contract graze neighbor's crop field

keep grazing records

- Soil health tests in control & treatment fields

PLFA

Total Living Microbial Biomass, Phospholipid Fatty Acid (PLFA) ng/g
Functional Group Diversity Index

	2015	2016	2017
Treatment	844.26	1434.67	900.36
Control	988.92	899.28	418.59

Total Biomass	Diversity	Rating
< 500	< 1.0	Very Poor
500+ - 1000	1.0+ - 1.1	Poor
1000+ - 1500	1.1+ - 1.2	Slightly Below Average
1500+ - 2500	1.2+ - 1.3	Average
2500+ - 3000	1.3+ - 1.4	Slightly Above Average
3000+ - 3500	1.4+ - 1.5	Good
3500+ - 4000	1.5+ - 1.6	Very Good
> 4000	> 1.6	Excellent

Fall & Spring Grazing



November 12, 2016

Fall Grazing:

Nov. 9 - 18: 55 finishers

Dec. 4 - 12: with 53 feeders

Dec. 17 – 24: with 53 feeders



April 12, 2017

Spring Grazing:

Apr. 3 - Apr. 10: 100 cow-calf pairs & heifers

Apr. 22 - Apr. 29: 120 cow-calf pairs

Apr. 12 - May 7: 50 feeders & 150 cow-calf pairs

Value of Cover Crop Forage

- 2015-2016 = \$1,535 @ \$80/ton
= \$3,185 @ \$100/ton
- 2016-2017 = \$2,921 @ \$80/ton
= \$6,061 @ \$100/ton

What I've learned

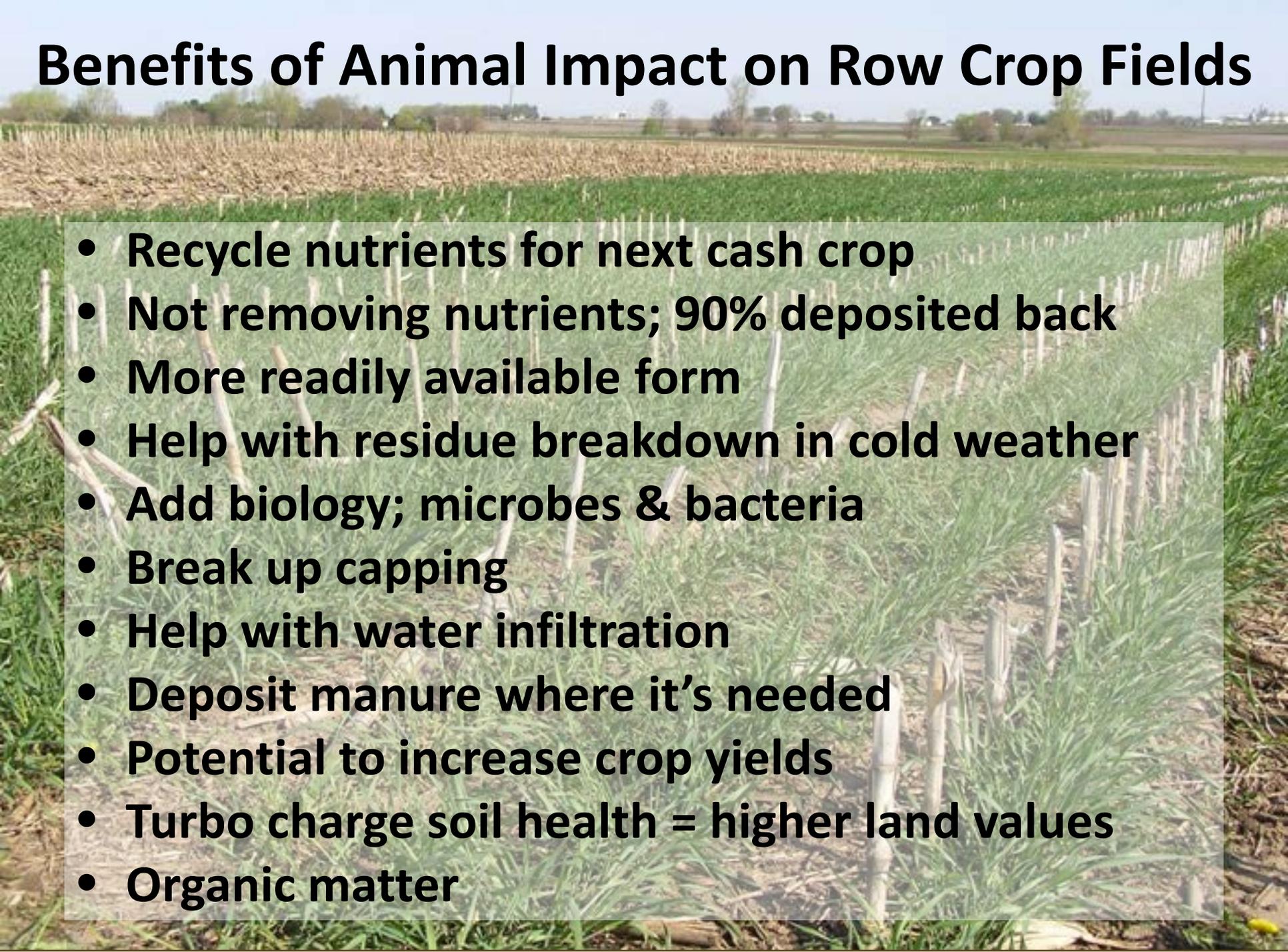
- **Make your cover crop as important as your cash crop**
- **Use shorter season hybrids**
- **Use the right chemicals for grazing**
- **Plant cover crops earlier**
- **Location of crop field from cows - need sacrifice area?**
- **Water/fence/insurance**
- **Multispecies cover crop vs. single species**
- **Use winter kill cover crop if you don't graze in spring**
- **Full season cover crop – add grazing for a full year**

SOIL HEALTH PRINCIPLES

1. Keep the soil covered
2. Minimize soil disturbance
3. Increase crop diversity
4. Keep living roots in the soil
5. Integrate livestock

www.nrcs.usda.gov

Benefits of Animal Impact on Row Crop Fields



- **Recycle nutrients for next cash crop**
- **Not removing nutrients; 90% deposited back**
- **More readily available form**
- **Help with residue breakdown in cold weather**
- **Add biology; microbes & bacteria**
- **Break up capping**
- **Help with water infiltration**
- **Deposit manure where it's needed**
- **Potential to increase crop yields**
- **Turbo charge soil health = higher land values**
- **Organic matter**