Learning From On-Farm Research: PFI's Cooperators' Program

Bruce Carney – Carney Family Farms
Tom Frantzen – Frantzen Farm
Meghan Filbert –Livestock Coordinator, Practical Farmers of Iowa

Jan. 20, 2018

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MISSION:

Equipping farmers to build resilient farms and communities.

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Cooperators' Program

Since 1987…

PFI's vehicle for conducting on-farm research on the issues and concerns deemed most important by our members.

Goal: Make sure practical and farmer-directed on-farm research is conducted and shared with other farmers in Iowa, the Midwest and beyond.

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Since 1987…

230 cooperators have conducted…

1,259 on-farm trials

Cooperators' Meeting

- Annual, 2-day meeting in December.
- By invitation only.
- Very much a *working* meeting for those attending.
    1. Reporting
    2. Knowledge gaps & project ideas
    3. Project design

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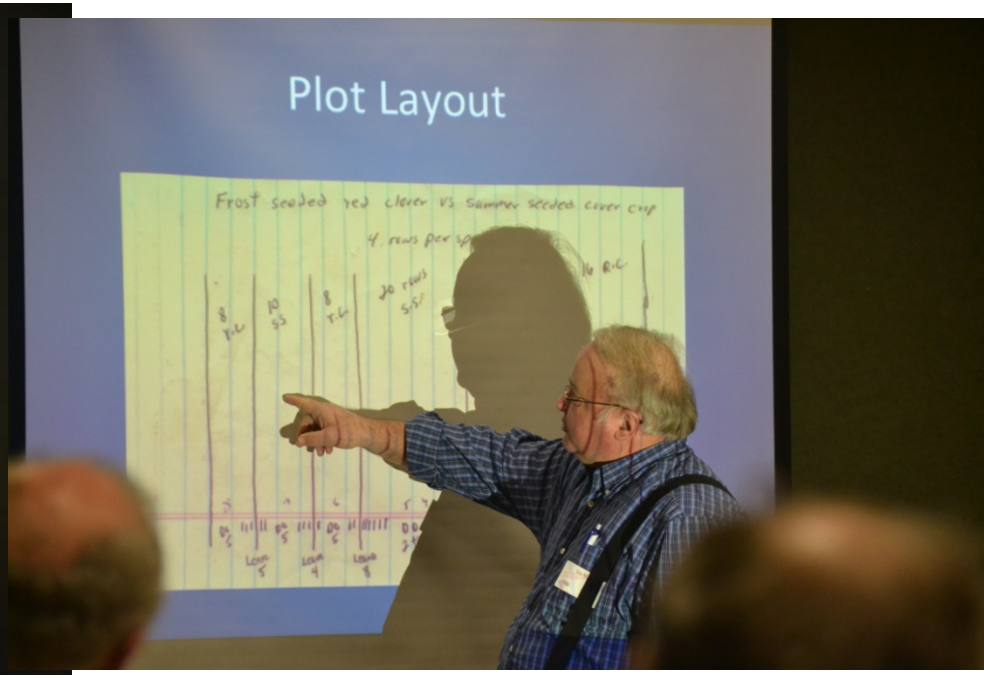
1. Farmer-researchers present on past year's findings.



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2. Identify knowledge gaps & new projects

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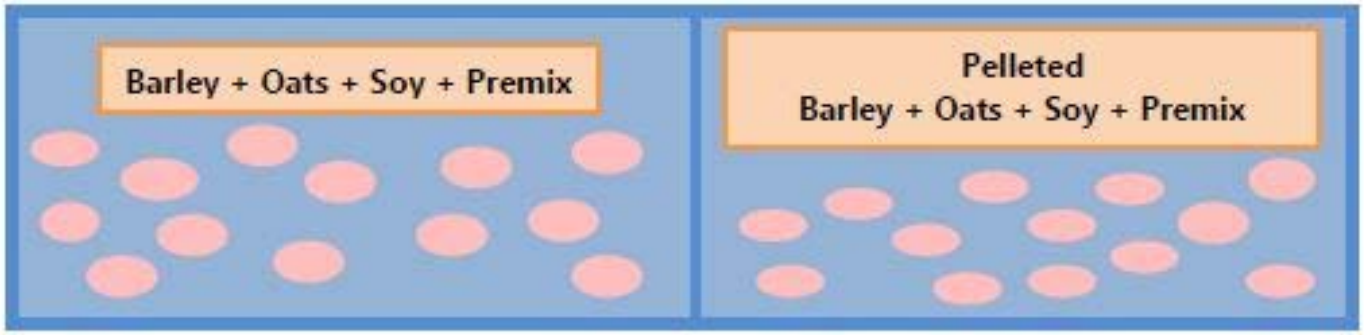
3. Project design



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4. Implement new trials on-farm

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5 (1. again). Farmer-researchers present on past year's findings.

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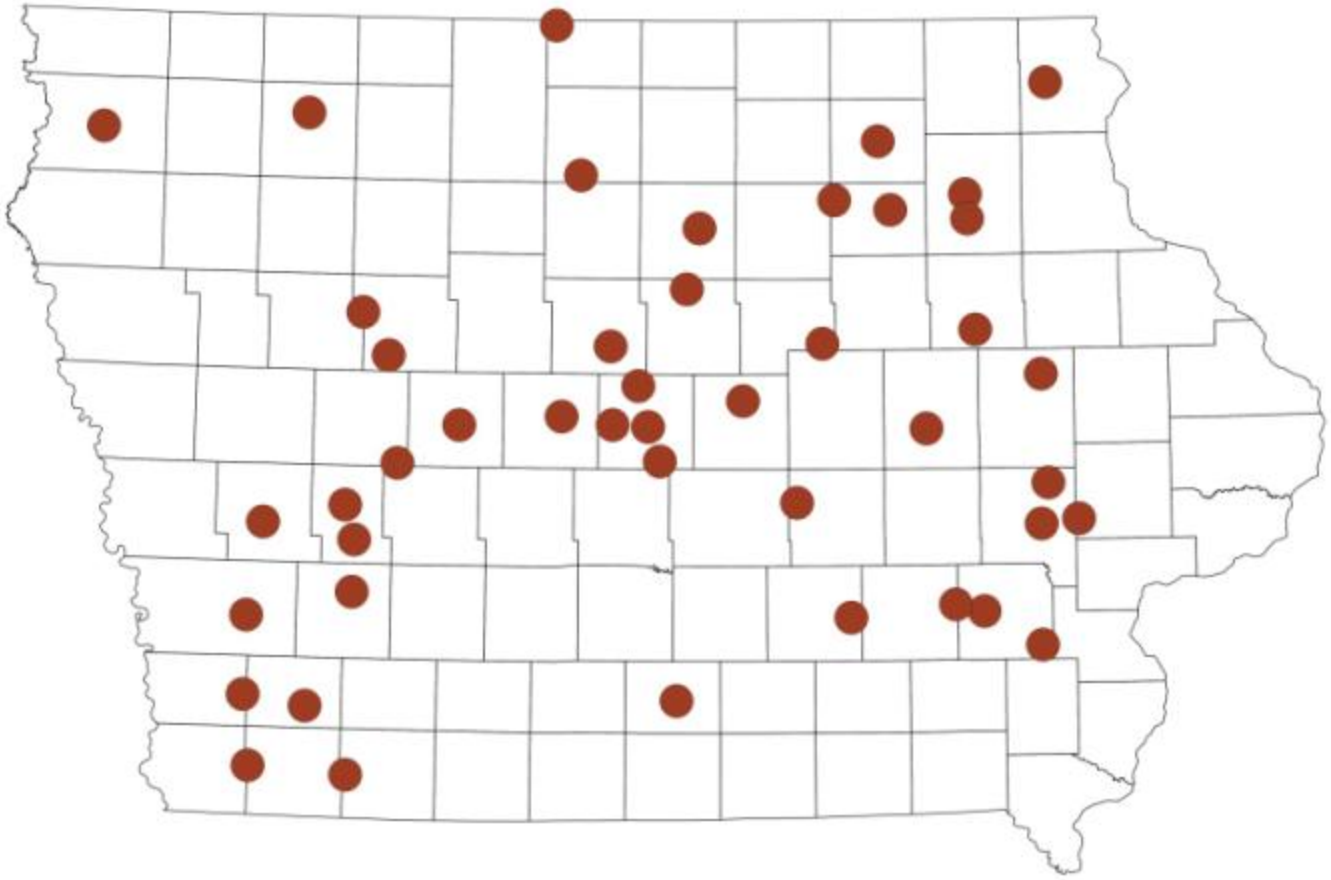
In 2017…

51 cooperators took part in…

71 on-farm trials

Project Locations, 2017



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Rolling Cover Crops –

Tim Sieren, Scott Shriver, Jack Boyer

Can rolling covers provide better weed control and reduce costs in my soybeans?

Summer Lettuce Variety Trial –

Jill Beebout, Carmen Black, Rob Faux, Kate Edwards, Alice McGary, Jordan Scheibel

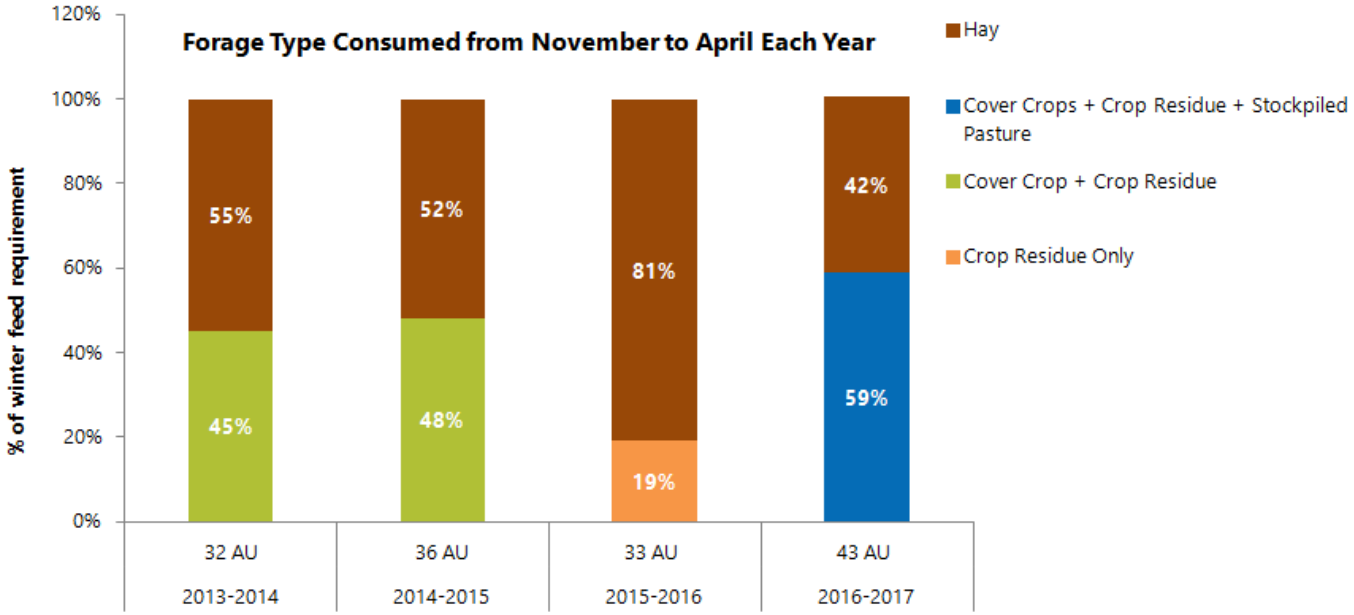
This trial encouraged us to experiment with varieties we hadn't used before, and we had success. These varieties filled a void in our CSA and market offerings.

Winter Feed Monitoring on a Grass-Fed Cattle Farm

Dave and Meg Schmidt

What is the cost of feeding different forages throughout the winter?

How can we meet our goal of only feeding hay one month out of the year?



Underseeded vs. Mid-Summer-Seeded Green Manure Cover Crops–

Vic Madsen, Doug Alert, Margaret Smith

Which will provide more N to the succeeding corn crop?

Grazing Cover Crops in Cow-Calf Operations –

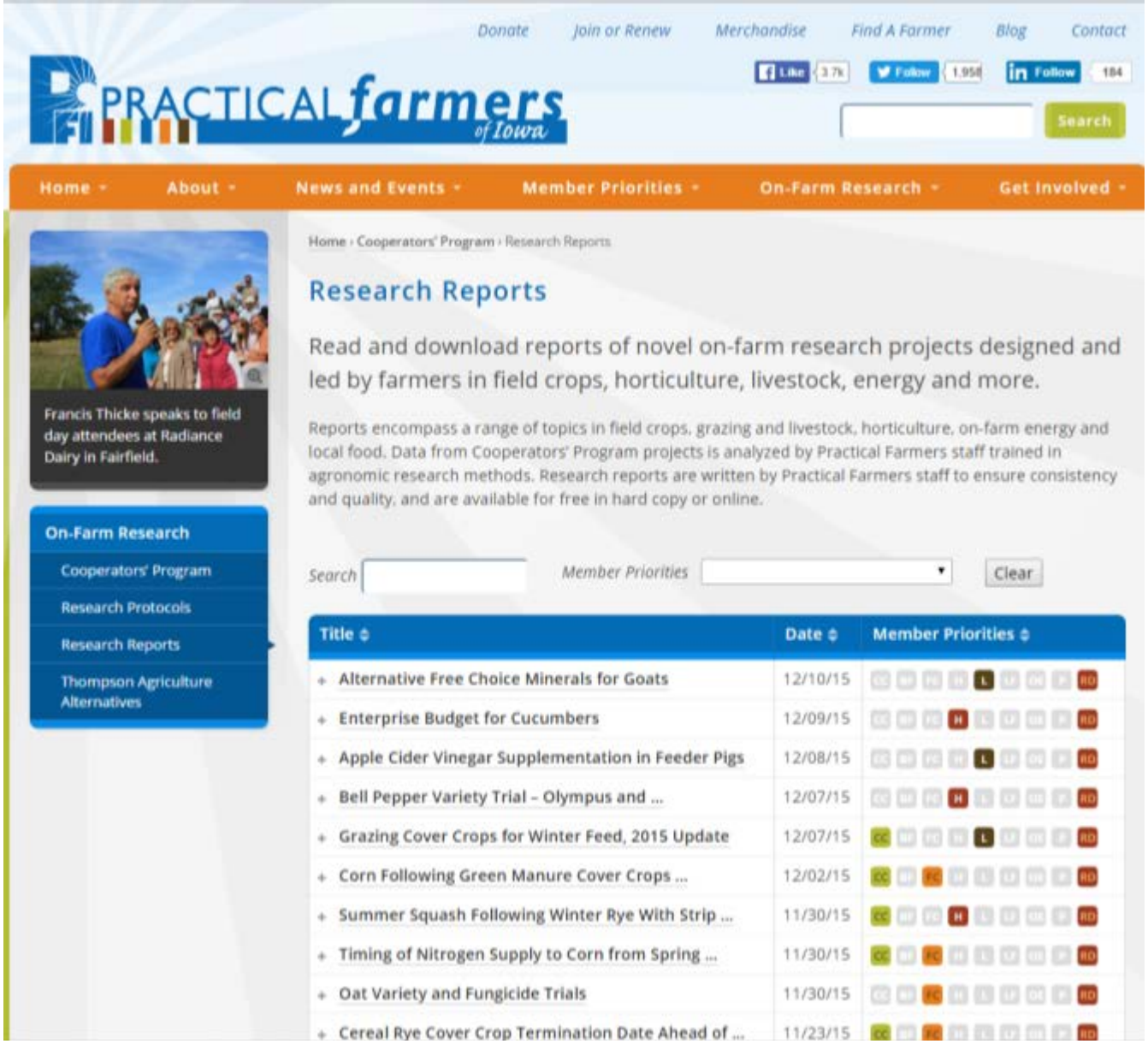
Wesley Degner, Bill Frederick, Mark Schleisman

"When cattle are out grazing covers, we don't have to feed cows, which can save us money."

Fall Brassicas Following Grazed and Un-Grazed Cover Crops –

Carmen Black, Mark Quee

This project helped me think through how I want to use the sheep on my vegetable fields and what will be most feasible.



http://practicalfarmers.org → On-Farm Research → Research Reports

On-farm researchers…

- Are curious about observations made on the farm
- Have questions about production practices
- Set project designs and parameters
- Collect and record data
- Share findings with other farmers
- **Generate new questions & experiments!**

How to get involved…

Stefan Gailans, field crops
stefan@practicalfarmers.org

Liz Kolbe, horticulture
liz@practicalfarmers.org

Meghan Filbert, livestock
meghan@practicalfarmers.org

515-232-5661


Carney Family Farms
Maxwell, IA


GOLD MEDAL
BEVERAGES

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

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Livestock Research

Monitoring Birds in Rotationally Grazed Pasture, 2017 Update

Staff Contact:
Meghan Filbert– (515) 232-5661
meghan@practicalfarmers.org

Cooperators:
- Bruce Carney - Maxwell

Student Researchers:
- Grace Baumgartner - Drake University
- Conner Willis - Drake University

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 then 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 Kestral	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 Grackel	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

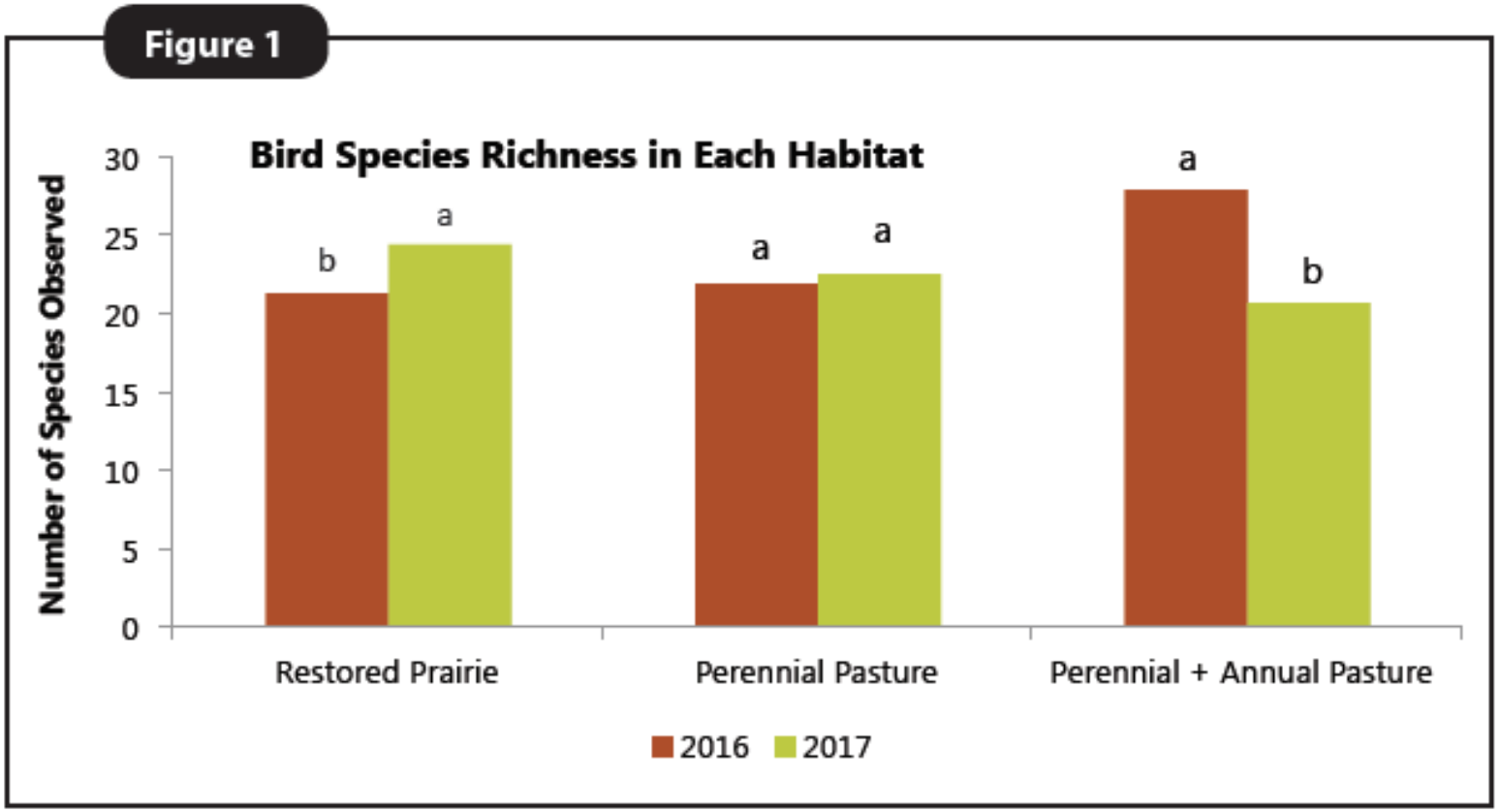


Figure 1. Number of different bird species observed in each habitat type each year. By habitat, columns labeled with different letters are significantly different. At $P < 0.10$, the Restored Prairie had significantly more diverse species than the year prior and the Perennial + Annual Pasture had significantly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

Bird Monitoring

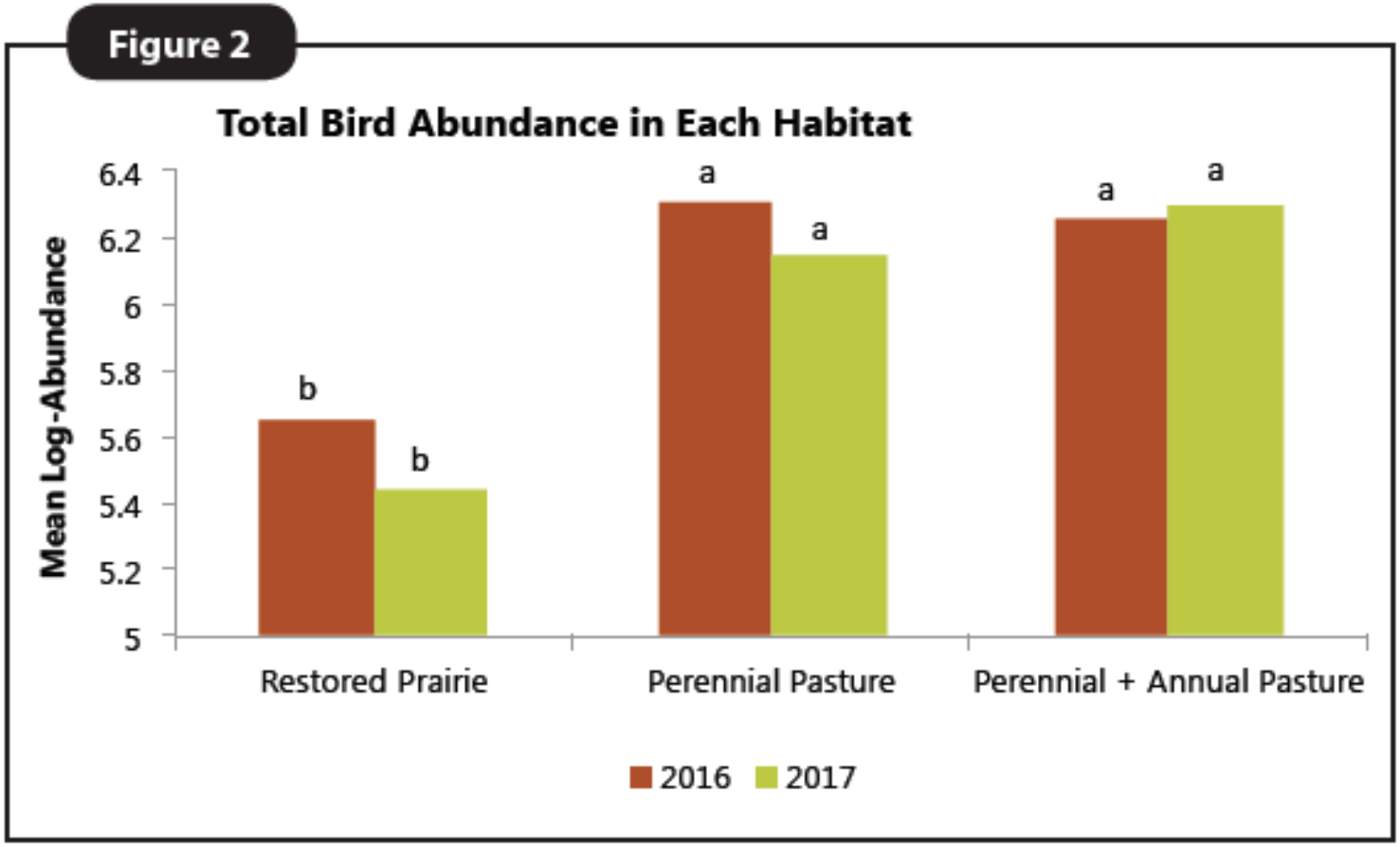
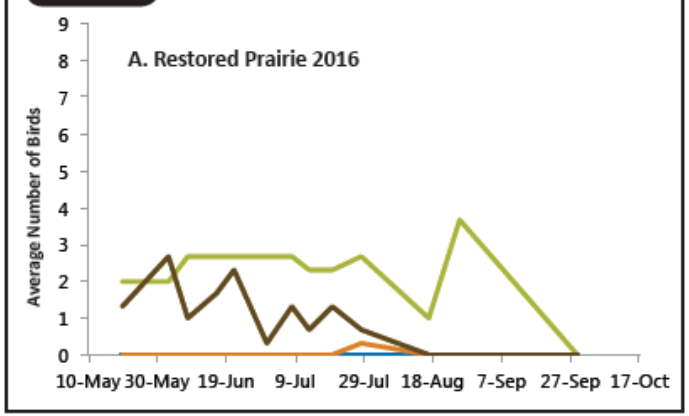


Figure 2. Total number of all bird species observed in each habitat type reported on a log scale. For each habitat type, columns labeled with different letters are significantly different. At $P < 0.05$, more birds were observed in the Perennial Pasture and Perennial + Annual Pasture than Restored Prairie,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



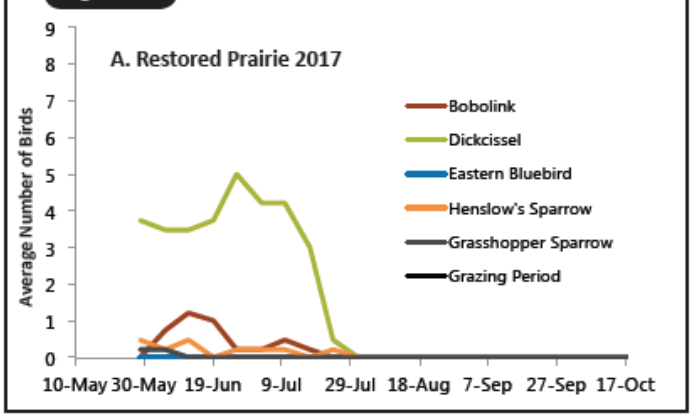


Figure 3b

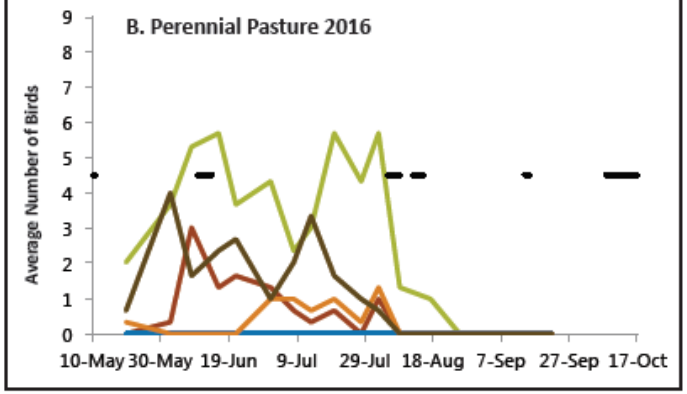


Figure 4b

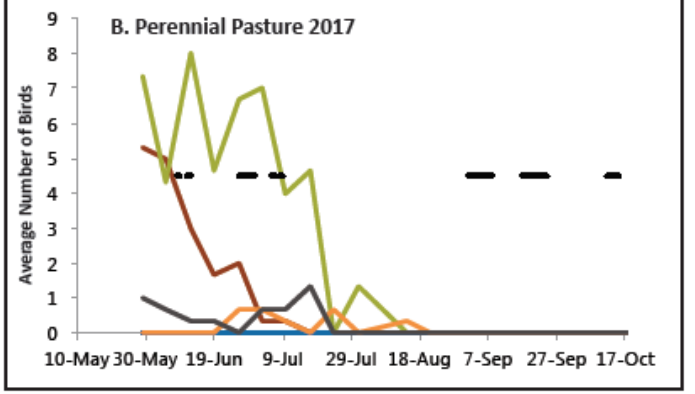


Figure 3c

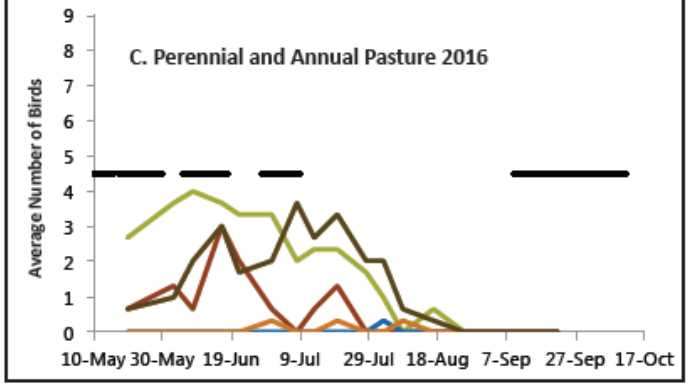
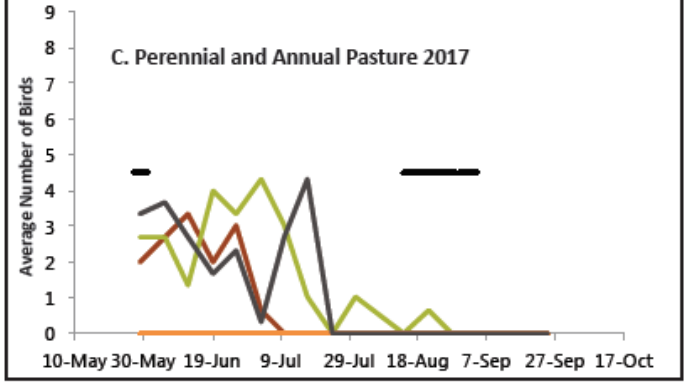


Figure 4c



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 then 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

	2015	2016	2017
Treatment	**844.26**	**1434.67**	**900.36**
Control	**988.92**	**899.28**	**418.59**

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

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

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

Frantzen Farm
New Hampton, IA


ORGANIC VALLEY


PRACTICAL
FARMERS
OF IOWA
FI
ON-FARM
RESEARCH

What are we trying to achieve?

- OUR GOAL IS TO IDENTIFY AND HOPEFULLY ADDRESS BARRIERS TO THE VIABILITY OF NICHE MARKET PORK PRODUCTION.

Apple Cider Vinegar Supplementation in Feeder Pigs

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Livestock Research

Apple Cider Vinegar Supplementation in Feeder Pigs

Staff Contact:
Meghan Filbert – (515) 232-5661
meghan@practicalfarmers.org

Cooperators:
- Tom and Irene Frantzen - New Hampton

Funding By:
The McKnight Foundation

Web Link:
http://bit.ly/pfi_livestock

In a Nutshell

- Apple cider vinegar has been long advocated for its health benefits and is gaining recognition as a health supplement for livestock.
- Apple cider vinegar is held to being a health tonic that promotes beneficial gut bacteria, improves digestion of feedstuffs, enhances performance, and helps decrease parasite load.
- Tom Frantzen supplemented three groups of pigs with apple cider vinegar and measured feed intake, average daily gain, feed efficiency and return over feed costs compared to pigs not supplemented.

Key findings:

- Pigs supplemented with apple cider vinegar were observed to have a

Two groups of pigs, one supplemented with apple cider vinegar and one not supplemented. The split feeder in the center allowed Tom to conduct the trial. Photo taken November 17, 2015.

APPLE CIDER VINEGAR…

5 GALLONS PER TON

Figure 2

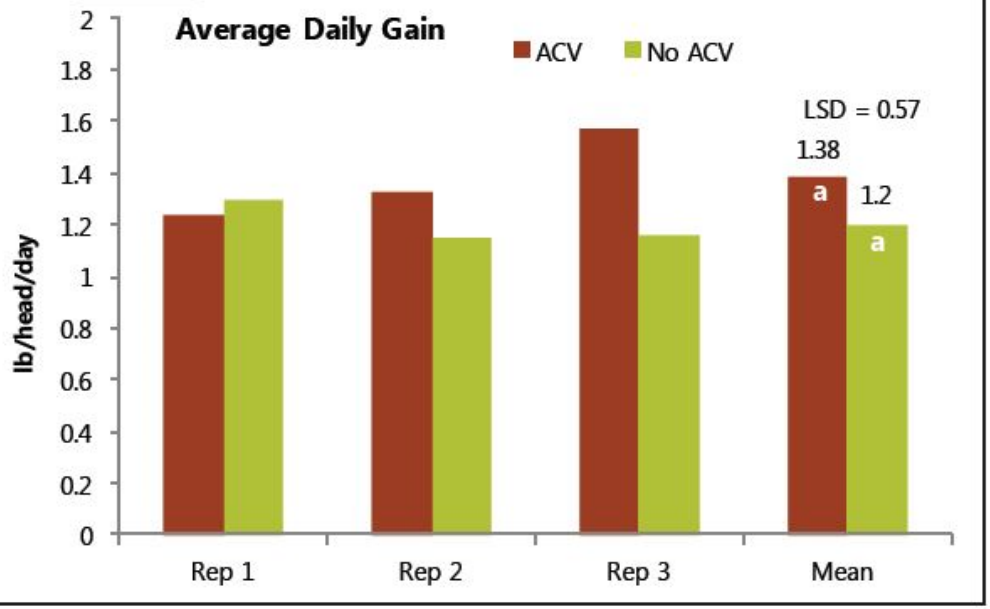

Figure 2. Average daily gains for each rep as well as the means for pigs fed apple cider vinegar (ACV) and those not (No ACV). For the mean, columns with same letters are not significantly different at $P \leq 0.05$. The least significant difference (LSD) is above the mean column.

Figure 4

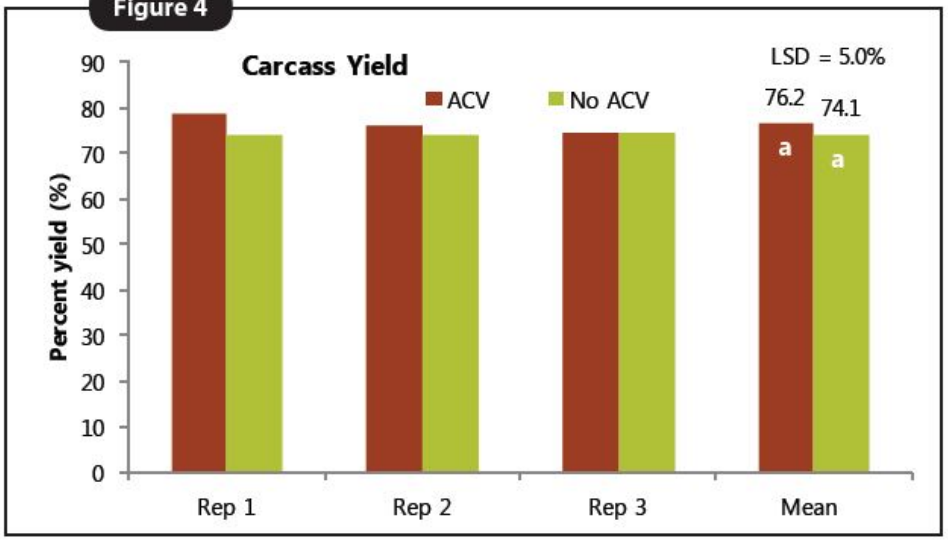

Figure 4. Carcass yields for each rep as well as for pigs fed apple cider vinegar (ACV) and those not (No ACV). For the mean, columns with same letters are not significantly different at $P \leq 0.05$. The least significant difference (LSD) is indicated above the mean column.

Table 3

Costs and profits incurred from pigs supplemented with apple cider vinegar (ACV) and those that were not supplemented with apple cider vinegar (no ACV).

	Rep 1		Rep 2		Rep 3		Mean	
Treatment	ACV	No ACV	ACV	No ACV	ACV	No ACV	ACV	No ACV
Carcass price ($/lb)	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00	$2.00
Carcass weight (lb/hd)	173.00	177.40	179.07	155.99	187.69	165.42	179.92	166.27
Carcass value ($/hd)	$346.00	$354.80	$358.14	$311.98	$375.38	$330.84	$359.84	$332.57
Total feed intake (lb/hd)	637	741	679	607	671	585	662	644
Total feed costs ($/hd)	$168.17	$184.51	$179.26	$151.14	$177.14	$145.67	$174.76	$160.36
Net returns ($/hd)	$177.83	$170.29	$178.88	$160.84	$198.24	$185.17	$185.08	$172.21

ACV pigs netted $12.87 more per head than No ACV pigs.

Apple Cider Vinegar

Key findings:

- Pigs supplemented with apple cider vinegar were observed to have a sleeker coat, improved vitality and looked healthier than those not receiving apple cider vinegar.
- Pigs supplemented with apple cider vinegar tended towards increased feed intake and average daily gains, higher carcass yields, better feed efficiency, and higher profits.

Project Timeline:

September 2014 – November 2015

"The results indicate that ACV improves pig performance and this is something that merits further investigation, by other farmers and by industry." - Tom Frantzen

"Every time we sorted pigs, I could see a difference in size and could pull out vinegar pigs right away from their looks." - Irene Frantzen

"After feeding ACV in three repetitions, I saw improved pig vitality. Vinegar pigs were more vigorous." - Tom Frantzen

Pelleted Small Grains Fed to Pigs

Objective: To measure if feed efficiency of a small grain (high-fiber) based diet increases when pelleted

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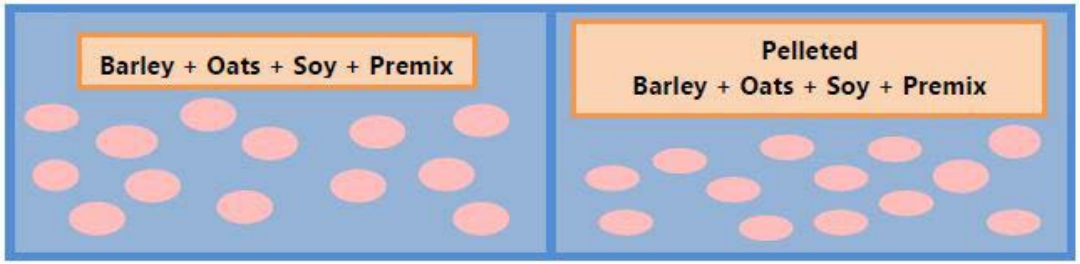
Livestock Research Protocols

Pelleted Small Grains Fed to Pigs

Objective: To measure if feed efficiency of a small gain (high-fiber) based diet increases when pelleted.

Project Period
April – August 2017; from weaning to finish.



Methods

- Split litters into two groups, take weights monthly
- Color code ear tags identify each pig !

- Feed one group mash and one group pellets

- Keep records of ration composition, nutritional analysis and costs

- Collect carcass information

SPLIT FEEDER

WHEN WE DO REPLICATED TRIALS WE ROTATE THE ‘TREATED’ SIDE TO EVEN OUT “BACKGROUND NOISE”.

PFI PURCHASED A SCALE

WITH THIS SCALE WE CAN OBSERVE THE INDIVIDUAL PERFORMANCE OF THE EAR TAGGED PIGS IN THE FEEDING TRIAL.

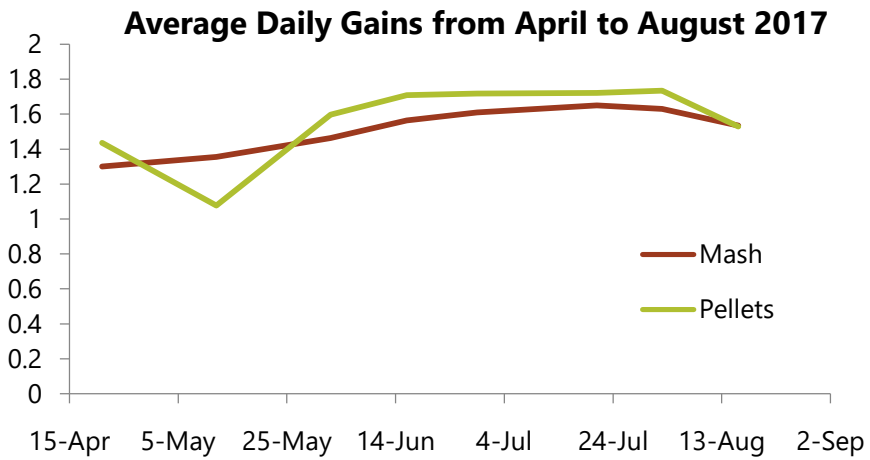
PFI TRIAL – WEIGHING & RECORDING

WE GENERATE INDIVIDUAL ANIMAL PERFORMANCE WITH PERIODIC WEIGHING.

FEED SAMPLES ARE ANALYZED.

HIGH FIBER DIETS ARE RESEARCHED.

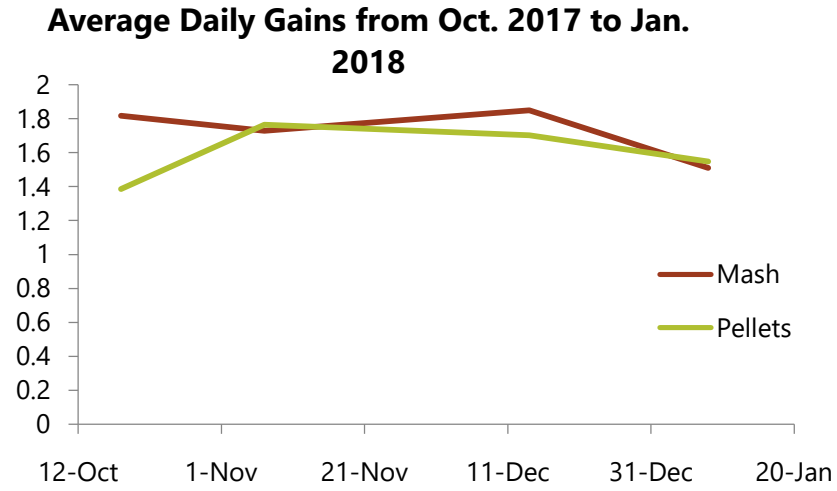
Results



Round 1 Average Daily Gains:

Mash – 1.54

Pellets – 1.53



Round 2 Average Daily Gains:

Mash – 1.51

Pellets – 1.55

2ND LOCATION SPLIT FEEDER TRIAL

Next Steps…

2018 AND 2019 RESEARCH

- FOCUS #1 : REPLACING SOME OF THE CORN IN GROW FINISH DIETS WITH HYBRID RYE. THREE ROUNDS OF COMPARISONS.

- FOCUS #2 : COMPARING THE EFFECT OF HIGH TEMPERATURE PELLETING OF THE RYE REPLACEMENT DIET TO NOT PELLETED.