Ideas for Impactful, Local Soil Health Demonstrations and Education: The Clinton County ILFB Project, 2016-2020

> Advanced Soil Health Training August 36, 2020



## The Clinton Co NLRS Project 2020 And Some Project History

The Clinton CFB received \$15,000 for their 2020 project that continued to explore the influence of manure management and cover crops on reducing nutrient losses.

In partnership with IFB, the Clinton CFB has spent over \$70,000 on local Nutrient Loss Reductions Strategy (NLRS) research and education since 2016.

Their multi-faceted NLRS project for 2020 included comparisons of different cropping systems to show impacts on soil health and nutrient loss. From no manure or cover crops, to manure and well-established cover crops, these systems demonstrate how phosphorous and nitrogen are utilized by both cover and conventional crops while improving soil health and water quality.

## The Clinton Co NLRS Project 2020 And Some Project History

In addition, Clinton CFB expanded their efforts to emphasize the value and importance of manure (and its management) as a component of their project and contributor to overall NLRS success. They continue to draw from 5 years of NLRS project data to provide results incorporated into educational components for producer and consumer

outreach through the

following ways:

1. Field day(s) focusing on results from local cover crop plots, including:

- a. Fall cover crop variety comparisons for winter hardiness and lateplanted success (12individual and one 12-way mix)
- b. Summer forage plot (15 individual and one 15-way mix)
- c. Forage production and relative forage quality (RFQ) feed values
- d. Cover crop and manure application economics, and
- e. Overall impacts on Soil Health

2. Publication of project data for producers to make better management decisions

## The Success of Clinton County's NLRS Program

- **1. Determine the Local Needs**
- 2. Determine the Resources Available
- 3. Set a Goal or Series of Goals
- 4. Ask for Assistance (Don't Take No ????)
- 5. Be Prepared to Do a Bunch of Work
- 6. Have Field Days (Workshops)
- 7. Disseminate the Information
- 8. Assess the Program After and Determine if the Goals were met.
- 9. Add New Goals and Ideas



### **Determine the Local Needs**

## Clinton County is one of, if not, the largest Livestock County in Illinois.



GOAL: Provide educational materials and programs to the County Farm Producers regarding the INLRS through the use of Manure Management and Cover Crop use to protect and minimize impacts on Water Quality.





## Determine the Resources Available and Find Collaborators

Clinton County Farm Bureau Clinton County FB Members Clinton County USDA NRCS Clinton County SWCD University of Illinois Extension Kaskaskia College Ag Dept. Heartland Conservancy

Illinois Beef Association Illinois Pork Producers Prairie Farms Dairy Schuette Seeds Wyciskalla Consulting Gateway FS The Maschhoff's

Plus many others not listed and Guest Speakers that were not paid (but others were).

Get the Community Involved!





#### **Ray Archuletta**





Dr. Jerry Hatfield, USDA



### **Doug Peterson, USDA**



Dave Fisher, U of I



## Bryon Kirwan, USDA



**Ted Funk, IPPA** 



### Dr. Amir Sadeghpour, SIUC



### Larry Antosch, Ohio FB



### **Michael Andreas**



Lauren Lurkins, ILFB



### Sarah Carlson, IPF



John Pike, Pike Agronomics



### **Jack Boyer, Iowa Farmer**



Mike Plumer, U of I

## Kaskaskia College Ag Students







## **Clinton County FB Producers and Others**



















## **Equipment and Demos**

















## **Field Days and Plots**















## **Field Days and Plots**











## Field Days and Plots (I learned something here!)



## **Manure Spreader Calibration**



# Water Quality











## **Other Photos**



## **Other Photos**



## When building a forage feeding management program you need to first determine: What were the 2020 Goals We Wanted to Obtain?

1.	Do you want high protein contents to build muscle mass or are you after
	high sugars and energy?
2.	Who is available to assist me with the decisions?
	Crop Specialist, Animal Nutritionist, Other Producers?
3.	What cover crop species mixes will help me reach these goals all year long?
	Cool-Season Mixes and/or Warm-Season Mixes.
4.	How many species do I need in the mixes?
	3-5 species, 5-9 species, 11+ species?
5.	Fertility and Manure/Nutrient Management of My Cover Crops?
6.	Are these strictly Covers for "home grown" N and nutrient sinks/traps?
7.	Are these Covers to be utilized as Forages (ties back to Point 1)
8.	If I have manures available, how much can I reduced purchased fertilizer inputs?
9.	Am I making an Impact on Soil Health, Soil Quality, and Water Quality around my farm?



#### SOIL HEALTH, 2019-2020 COVER CROP PLANTS

Plot/Treatment	2020# Score
Brook Oats	18.6
Barley , VNS	18.5
Rymin Rye	20.9
Triticale, VNS	14.9
Elbon Cereal Ry e	16.5
Wintergrazer Cereal Rye	20.8
Paserell Plus Annual Ryegrass	20.6
ARG-1 Annual Ryegrass	20.8
Hairy Vetch, VNS	19.5
All Sunrise Crimson Clover	15.4
Balansa Clover	30.8
Rapeseed, VNS	21.7
Mix of All Above	24.7
MLA Field Site	11.8

# = Analyzed by USDA-ARS (Haney), Temple, TX

#### NLRS PROJECT - MULTIPLE FIELD LOCATIONS

#### SOIL HEALTH, 2016-2020

Field ID	Manure History	2016* Score	2017 <sup>s</sup> Score	2018# Score	2019# Score	2020# Score
DC	Y	6.7	15.0	13.3	13.3	19.0
BH	Y	7.7	18.7	14.6	12.6	16.7
MLA	Y	7.0	18.2	14.1	15.4	11.8
MLS	N	5.5	15.9	12.0	10.0	7.2
DPN	Y	7.7	18.2	14.5	11.4	16.3
DPS	Y	7.3	18.5	14.2	12.1	21.9
DPH	Y	15.3	18.5	16.9	14.5	24.9

\* = Analyzed by Hidwest Laboratory, Omaha, NE # = Analyzed by USDA-ARS (Haney), Temple, TX

SPECIAL NOTES:

BH is in a Cr-Sb-WhDC Soy rotation, heavily manured and NO cover crop use. DPH was a pasture in 2016. It was illed, manured, and put into production in 2017 with cover crop use. MLS had been in a Cn-Soy rotation. Pail 2016 was the first introduction of cover crops. MLS was not put into Covers in 2019 and went back to a Cn-Soy-WhDC Soy rotation.

#### NLRS PROJECT - LATE PLANTED COVER CROP FOR WINTER SURVIVABILITY



#### **COVER CROP ECONOMICS**

EXPENSES	PER ACRE
Manure Hauling	\$25
Cover Crop Seed (7-Way Mix)	\$35
Seed Drilling	\$20
Cutting	\$20
Raking	\$10
Baiing/Wrapping/Logistics	\$60
Tractor Crimping/Rolling	\$15
Corn Seed	\$54
Corn Planting	\$20
Pesticide Applications	\$52
Nitrogen Fertilizer (28% UAN)	\$52
Corn Started Fertilizer	\$21
Combining	\$30
TOTAL EXPENSES	\$414
TOTAL EXPENSES	\$414
TOTAL EXPENSES	\$414 PER ACRE
TOTAL EXPENSES INCOME 1st Cutting Cover Mix	\$414 PER ACRE \$320
TOTAL EXPENSES INCOME 1st Cutting Cover Mix 4 ton/ac at 63% molst., 2 ton DM	\$414 PER ACRE \$320
TOTAL EXPENSES INCOME 1st Cutting Cover Mix 4 ton/ac at 63% molst., 2 ton DM RFQ = 132 \$160/ton	\$414 PER ACRE \$320
TOTAL EXPENSES INCOME 1st Cutting Cover Mix 4 ton/ac at 63% moist., 2 ton DM RFQ = 132 \$160/ton Corn Grain Marketed	\$414 PER ACRE \$320 \$721
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TOTAL EXPENSES INCOME 1st Cutting Cover Mix 4 ton/ac at 63% moist., 2 ton DM RFQ = 132 \$160/ton Corn Grain Marketed 2019 Ave = 206 bu/acre Using \$3.50/bu TOTAL INCOME POSITIVE CASH FLOW	\$414 PER ACRE \$320 \$721 \$721 \$1,041 \$1,041

Rental Ground without full forage removal needs 149 bu/acre to reach the breakeven point at \$3.50/bu Corn Grain.



#### FALL PLANTED - HARVEST YIELD DATA RESULTS

		Estimated Wet-Wrap	Relative Forage	Relative Forage	Crude	Sugar - Ethanol	Net Energy	Net Energy
		45 % Moleture	Quality	Value	Protein	Soluble Carbs (ESC)	for Maintenance	for Gain
Plot	Tint	Weight (tone/ ac)	(RFC)	(RIPV)	(%)	(% - DM Basis)	(NEM, MonMb)	(NEG, MosMb)
1	Brook Oats	2.38	141	133	11.00	13.51	0.608	0.347
2	Barley, VNS	2.81	131	111	9.79	10.70	0.550	0.294
3	Rymin Rye	2.87	104	91	9.22	6.91	0.431	0.183
4	Triticale, VNS	2.96	127	115	12.49	11.08	0.572	0.314
5	Elbon Cereal Rye	1.83	121	106	12.50	9.30	0.513	0.260
	Wintergrazer Cereal Rye	2.34	112	98	11.31	8.40	0.456	0.207
7	Paserell Plus Annual Ryograss	4.31	128	127	9.60	13.79	0.571	0.313
8	ARG-1 Annual Ryograss	3.74	134	125	8.49	13.77	0.572	0.314
9	Hairy Vetch, VNS	0	0	0	0	0	0	0
10	All Sunrise Crimson Clover	0	0	0	0	0	0	0
11	Balanea Clover	2.39	243	195	26.23	8.66	0.748	0.471
12	Rape, VNS	0	0	0	0	0	0	0
13	Mix of All Above	4.80	139	113	13.69	8.26	0.575	0.316
Ave.		3.04	138	121	12.43	10.44	0.559	0.302
	Desired Ranges		100 - 200	120 - 190	18 - 24		0.53 - 0.62	0.27 - 0.36

Harvest Dates: Plots 5 and 8 on 4/27/2020, All Others on 5/7/2020



#### SUMMER PLANTED - HARVEST YIELD DATA RESULTS

		Estimated Wet-Wrap	Relative Forage	Relative Forage	Crude	Sugar - Ethenol	Net Energy	Net Energy
		45 % Moleture	Quality	Value	Protein	(ESC)	for Maintenance	for Gain
Plot	Tmt	Weight (tons/ec)	(RFQ)	(RFV)	(%)	(% - DM Basis)	(NEM, Meal/ Ib)	(NEG, MoeVib)
1*	Teffgrase	2.16	149	105	20.45	2.19	0.605	0.344
2	Phacelin		-					
3*	Root Plow Radish	7.15	244	198	20.44	4.32	0.807	0.524
4*	Hybrid Turnipe	9.72	277	227	20.24	4.57	0.806	0.523
5	Buckwheat	8.01	148	148	18.05	2.77	0.648	0.382
6	Sunn Hemp	4.72	138	121	18.30	0.51	0.590	0.330
7	Cow Pee	5.53	199	162	21.32	2.02	0.679	0.411
8	Non-GMO Soybean	2.11	199	152	25.71	ND	0.718	0.445
9*	Pearl Millet	6.76	138	99	26.99	2.84	0.538	0.281
10*	German Millet	5.99	151	104	32.28	1.51	0.558	0.301
11	Hey King BMR Suden	7.27	120	98	14.42	4.61	0.628	0.364
12	Pro Max BMR Sudan	7.73	129	103	15.45	4.82	0.699	0.428
13	Sunflowers	2.98	249	174	24.75	0.87	0.824	0.539
14	Honeycomb Sorghum Sudan	9.53	127	102	13.69	5.43	0.685	0.416
15	310 Fonge Sorghum	5.59	118	91	13.82	3.80	0.588	0.328
18	15-Way Mix	9.57	126	103	11.32	6.69	0.590	0.330
East	13-Way Mix (No Man. 2019)		167	122	20.62	1.91	0.641	0.377
West	13-Way Mix (Manured 2019)		169	131	19.29	1.06	0.672	0.404
Ave.		6.32	167	132	19.83	3.12	0.663	0.396
	Desired Ranges		100-200	120 - 190	18-24		0.53 - 0.62	0.27 - 0.36

Harvest Date: 7/20/2020. \* = Earlier than normal harvest.

This Farm Participates in the Nutrient Loss Reduction Strategy

CLINTON COUNTY

#### **Questions** ???



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