

# On-Farm Conservation Demonstrations in Northeast WI

The following fact sheets highlighting on-farm conservation demonstrations were compiled in partnership by the Farmer Roundtable Advisory Committee and the Alliance for the Great Lakes. These projects were presented on January 26, 2018 at the 3rd Annual Fox Watershed Farmer Roundtable. Thank you to all the farmers, agronomists, and agency staff who helped to collect the information and photos!

## Farmer Roundtable Advisory Team & Speakers

### Panelists & Speakers

Jim Harbach

Gerard Troisi

Dan Brick, Brickstead Dairy

John Jacobs, Green Valley Dairy

Dan Diederich, Diederich Farms

Derek Van De Hey, New Horizons Dairy



**Speedy Agronomic Consulting, LLC**



# Interseeding: Advantages, Considerations, and Equipment

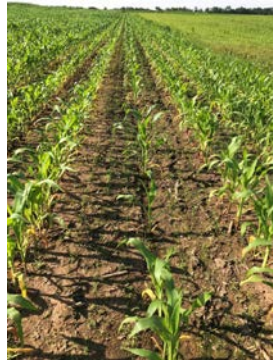
Nick Peltier, Brown County Land Conservation Department

## SUMMARY

- Interseeding cover crops is a method of planting cover crops between corn rows when corn is 6-10 inches tall, usually late June to early July.
- This allows the interseeded cover crop to germinate and start growing. The already growing corn quickly out competes and shades the cover crop causing the cover crop to go dormant and not interfere with corn growth.
- When the corn is harvested the cover crop gets sunlight again and starts to vigorously grow leading to a cover crop stand that is much thicker than if it were planted after fall harvest.
- Another thing to consider if you'd like to try interseeding cover crops is herbicide. With the prevalence of herbicide resistant weeds stronger herbicides with longer residual control are becoming more widely used; however, these herbicides will also prevent interseeded cover crops from growing. Cover crop mixes always provide the greatest benefit, but a herbicide program may only allow one type (i.e. broadleaf, or grass) of species to be planted. Be sure to consider this before interseeding.



## DEMONSTRATIONS IN NE WI



## INTERSEEDING RESEARCH

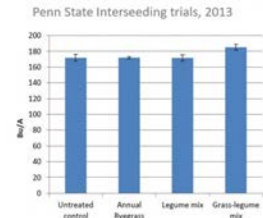


Figure 1. Impact of interseeding different species at V6 on corn grain yields at Rock Springs in 2013.

### UW Interseeding Test Plot, 2014

Cover crop biomass prior to corn harvest and corn yield in plots where the cover crop was interseeded.

Cover Crop	Biomass (ton/acre)	Corn yield (bu/acre)
Winter rye	0.65	182
Red clover	0.71	180
Radish	2.81	169
Oat/Pea	0.63	180
No cover crop		179

## EQUIPMENT



- 3 Interseeders available for use in the lower Fox Watershed.
  - 2, 6-row, drill style interseeders and a
  - 12-row toolbar style with a Valmar airseeder.
- Contact Brown or Outagamie County LCD for more information

## ADVANTAGES

- Can be planted in conjunction with side-dress nitrogen
- Cover crop is established early, don't need to plant cover crops during the busy fall season
- Little to no impact on corn yield
- Allows the use of clovers which can fix nitrogen for following crops better than other fall seeded covers
- Usually achieve more growth from cover crop vs covers planted after corn harvest

## CONSIDERATIONS

- Timing, interseeding should not be done before corn is at V-3 stage or after corn is V-7
- Species used; annual ryegrass, red clover, and crimson clover have work very well. Radishes and cereal grains (barley, oats) should not be used.
- Corn herbicide, avoid too much residual.
- Following crop, interseed more clover if next crop is corn, more grasses if next crop is going to be broadleaf (soybeans)
- Planting method; modified drill is best, broadcast with light incorporation (cultivator) also works well
- Little to no success in soybeans





# Cover Crops & Manure Application

## Andy Kiefer, Outagamie County Land Conservation Department

### SUMMARY

- Low disturbance manure application is a proven method to apply manure into a living cover crop. This type of application breaks the manure/cover crop bottleneck during unfavorable falls allowing the producer to focus on planting early cover crops.
- Secondly the growing cover crops are able to hold manure in place and store available nutrients that would otherwise be lost before the next planting season.

### DEMONSTRATIONS IN NE WI



- **Partnering Farms:** Brickstead Dairy, Hoelzel Dairy, Tinedale Farms
- **What is the biggest take away?** A cover crop no longer has to be planted after a manure application. A cover crop can act as a nutrient cellar and store available nutrients in their leaves.
- **How does this applicator compare to traditional units?** The applicator is very similar to any unit in the industry today. Only difference is simply relieving the stress of choosing between manure or cover crops in the fall. Max incorporation is roughly 14,000.
- **What's the plan for next year?** We have a 2nd low disturbance injector coming. It has a different concept than the coulter but hopefully has similar results.





# Sidedressing Manure

Andy Kiefer, Outagamie County Land Conservation

## SUMMARY

- With the Plum and Kankapot grant we were able to outfit a tanker with a 6/8 row toolbar that is capable of sidedressing manure between corn or soybean rows.
- Sidedressing manure opens a window for producers and custom applicators to apply manure, while providing a nutrient benefit to their growing cash crops.
- Additionally, the sidedress manure has been proven to reduce other commercial fertilizer costs to the producer.



## DEMONSTRATIONS IN NE WI

- **Partnering Farms:** VanWychen Farms, additional farms next year
- **What did you learn?** We were able to apply on roughly 80 acres of soybean and corn. We were unable to capture any yield data, but visually no yield difference was noted.
- **What's the plan for next year?** We for favorable weather and apply across many more acres with final yield data.





# Grazing Heifers

Adam Abel & Julie Hager, Natural Resources Conservation Service

## SUMMARY

### Bottom Line for Heifers on Pasture

- Gain at industry standards
- Improved first lactation production
  - Greater longevity
  - Higher fertility rates
- Produced at lower cost than comparable custom raising
  - Clean and well-conditioned animals
  - Greater calmness from daily interaction
- Aggressive eaters in pasture and feed bunk
  - Improved fitness/athleticism
  - Reduced leg and hoof problems
    - Reduced D.A. problems
    - Reduced calving difficulty
    - Reduced milk fever
  - Good PR



## GRAZING IN NORTHEAST WI



## GRAZING RESEARCH

### UW Study Summary

- Pasture-raised heifers can:
  - Exceed target industry standards for ADG
  - Exceed ADG than confined heifers
  - Produce more milk in first lactation
- Stocking rate, pasture management, and amount of grain fed will affect ADG, but can be easily modified depending on goals and resources.
- No significant difference versus confined heifers for:
  - Age at first calving
  - Frequency of displaced abomasums
  - Retained placentas at first calving

### Heifers on Pasture versus Confinement: Results at First Calving

University of MN: Laura Torbert, 2000– 2002

- More than 50% reduction in D.A.
- 40% less calving difficulty
- 33% less ketosis



**Research by Alan Rotz in Pennsylvania** looked at environmental impacts between lactating cows in confinement versus cows grazing on pasture in the summer

- With summer grazing only:
  - 24% less sediment loss
  - 22% less sediment-bound P runoff
  - 23% less soluble P runoff
  - 27% lower volatilization of  $\text{NH}_3$
  - 25% smaller carbon footprint
  - 14% lower net emission of greenhouse gases ( $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{NO}_x$ )



# No-Till Economics

## Jeff Polenske, Tilth Agronomy

### SUMMARY

We monitored yields and expenses on conventional and no-till fields in the Apple Creek area. Yields averaged across 3 years and three fields on very flat heavy red clay have been close. Funding for cover crops has helped add to a positive profitability. A better cover crop cover might have aided in a closer yield of the no-till to conventional. We look forward to continued work on this project. We are soil sampling this fall looking at fertility and soil health measurements of changes over 4 years. No-till can work on heavy red clay soils.



### PHOTOS



### VanWychen Farms

	2015			2016			2017		
	No-till	Corn grain Conventional		No-till	Soybean Conventional		No-till	Corn grain Conventional	
Fall cover crop				17					
Fall Chisel DMI		25			25			25	
Spr FC		12			24			12	
Spr herb burndown				10			11		
12 row planter	18	16		15	14		18	16	
Seed	105	105		60	60		100	100	
Herbicide /application	22	22	Acuron 1/2 rate	22	22		16	16	1oz Resolve
Starter fert	22	22		45	45		20	20	
nitrogen/applic	35	35	20 gal 32%/ with herb				32	32	
nitrogen/applic	47	47	20 gal 32% sidedress				32	38	
cover crop/potash/applic	58.5	30					47.75		
Consult	6	6		6	6		6	6	
rent	200	200		200	200		200	200	
combine	35	35		30	30		35	35	
trucking	11.69	11.34		3.64	3.99		11.61	12	
Insurance	15	15		15	15		15	15	
drying	38.41	34.56					37.73	30.87	
<b>Expenses</b>	<b>\$ 613.60</b>	<b>\$ 615.90</b>		<b>\$ 423.64</b>	<b>\$ 444.99</b>		<b>\$ 582.09</b>	<b>\$ 557.87</b>	
Cover crop cost share	\$56.22 167 bu	162 bu		\$56.22 52 bu	57 bu		\$56.22 165.9 bu	171.49 bu	
<b>Income</b>	<b>\$ 651.30</b>	<b>\$ 631.80</b>		<b>\$ 504.40</b>	<b>\$552.90</b>		<b>\$ 555.73</b>	<b>574.49</b>	
<b>Return</b>	<b>\$ 93.92</b>	<b>\$ 15.90</b>		<b>\$ 136.98</b>	<b>\$ 107.91</b>		<b>\$ 29.86</b>	<b>\$ 16.62</b>	





# Rye: Problems & Solutions

Jake Geiger, Tilth Agronomy

## Seeding & Fertility Management

### Seeding Winter Rye

- Cover Crop Seeding Rate: 40-60#
- Harvest Seeding Rate: 90-120#
- If manure is applied before planting 80# seed rate can yield as well as 180# seed rate
- If looking for increased weed control high seed rate gave better weed control when rolled and crimped
- Lower seed rates can be more beneficial to soil health. Improved airflow and light penetration. Ground dries out faster in spring. Easier to plant into a standing cover crop.
- Early Planting Benefits the crop
  - 1 ton more DM if planted by end of September vs. October



### Fertility Management

- Reduces fall nitrate levels following manure application
  - 20-50# of N can be scavenged in fall if rye is planted early
  - 40-60 unit of N requirement in spring
  - Very High C-N ratio.
  - Plan extra N if planting corn after rye
- Some guys are planting a legume in fall with the rye to reduce the C-N ratio the following year
  - Want to keep seeding rate of rye low 40-60# so it doesn't out compete the legume
  - 20-30# hairy vetch with the rye or 15-20# crimson clover
  - Inoculate if virgin ground
  - Want to plant a few weeks before the first frost so the legume gets established
- Very good at uptaking phosphorus: 18 pounds of P per ton of DM
- Rye increases concentration of exchangeable K near the soil surface
  - It brings it up from lower in the soil profile



## Termination Options & Considerations

### Termination Options

- Roller Crimping offer some weed control. Most effective on winter annuals, some control on legume, no effect on perennials.
  - Want to wait until crop is headed before crimping to prevent it from coming back
  - The roller creates a uniform mulch on the soil surface that breaks down slowly
  - Protects soil moisture
- Tillage: Speeds up degradation and release of nutrients for the primary crop. Little or no mulch layer for weed suppression.
- Herbicides: Allow a week for cover crop to die before planting the main crop
  - Want to kill early otherwise it can compete with the next crop



### Miscellaneous Facts

- Great winter hardiness
  - Forage Insurance policy if winter killed alfalfa
- Rye attracts armyworm moths: Scout for insects if going to corn
- Corn yield is reduced following rye.
  - DM tons of rye and late planted CS = or greater than full season CS
- Rye will grow later into fall and green up early in spring
  - Extends the growing season, recycles N from previous crop, and reduces erosion
- Very narrow harvest window for prime feed quality



# Multispecies Cover After Wheat

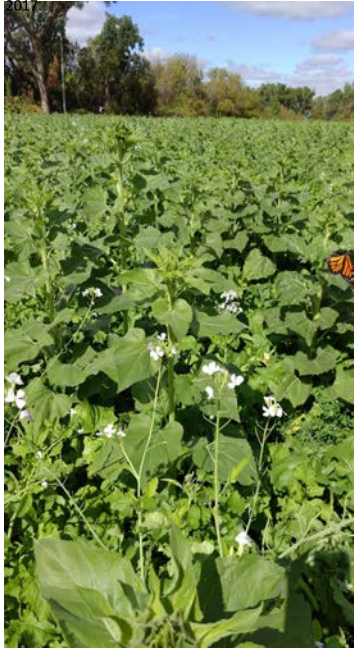
## Brent Petersen & Barry Bubolz, Fox Demo Farms

### SUMMARY

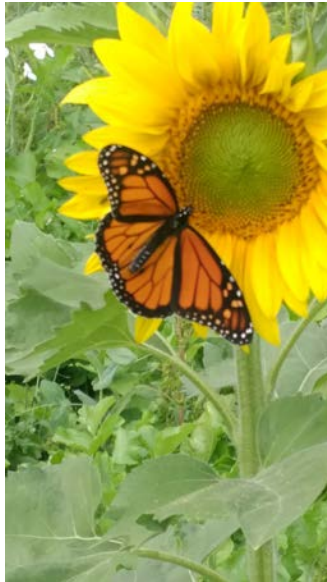
Diversified cover crops help to explore the soil profile and pull different nutrients back to the soil surface. We see our quickest soil repair with diversified mixes. This diversification improves resiliency of the soil, keeps insects populations in check and reduces the impact of diseases. These plants are partners in improving soils to what nature intended.



New Horizons Dairy planting into a multispecies cover crop mix on May 15,



This is a picture of a 7-8 way species mix at New Horizons Dairy. This is following winter wheat on Sept 27, 2017.



Monarch butterfly on Sept 28, 2017. This picture is also by New Horizons Dairy following winter wheat.



Multispecies cover crop at Brickstead Dairy on Nov 17, 2016.



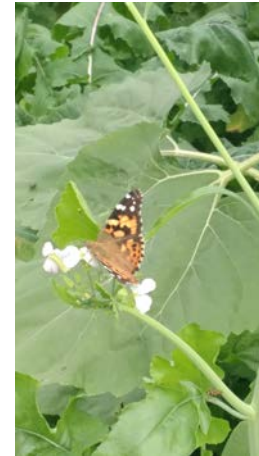
Multispecies cover crop mix. Sept 27, 2017. Tinedale farms preventative plant.



Multispecies cover crop at Brickstead Dairy on Sept 27, 2017.



This is a multispecies mix broadcast on a preventative plant field at Tinedale Farms.



Here is a moth on diversified cover crop mix at New Horizons Dairy on Sept 28, 2017. This follows winter wheat.

### DEMONSTRATIONS IN NORTHEAST WI AND SPECIES RECOMMENDATIONS

Table 1: Cover Crop Species Recommended for Planting in Wisconsin

Species	1 Minimum Seeding Rate in lbs. bu./ac. (incorporated seed)		2 Minimum Seeding Rate in lbs. bu./ac. (non-incorporated seed)		Seeding Date (statewide)	Planting Depth (inches)
	lbs.	bu.	lbs.	bu.		
GRASSES						
Annual Ryegrass ( <i>Lolium multiflorum</i> )	15	0.7	20	0.8	4/10-6/1, 8/1-9/1	1/4 to 1/2
Barley, Spring ( <i>Hordeum vulgare</i> )	50	1.0	63 to 75	1.3 to 1.6	4/10-6/15, 7/15-9/20	1/4 to 1 1/2
*Japanese Millet ( <i>Echinochloa frumentacea</i> )	22	0.5	28	0.6	6/1-7/15	1/2 to 1
*Sorghum/Sudangrass ( <i>Sorghum bicolor</i> x <i>S. bicolor</i> var. <i>Sudanese</i> )	28	0.6	33	0.7	6/1-7/15	1/2 to 1 1/2
*Sudangrass ( <i>Sorghum biclor</i> )	28	1.0	33	1.2	6/1-7/15	1/2 to 1
*Pearl Millet ( <i>Pennisetum glaucum</i> )	22	0.5	28	0.6	6/1-7/15	1/2 to 3/4
Wheat, Spring ( <i>Triticum aestivum</i> )	50	0.8	70 to 90	1.2 to 1.5	4/10-6/15, 7/15-9/1	1/4 to 1 1/2
Barley, Winter ( <i>Hordeum vulgare</i> )	50	1.0	63 to 75	1.3 to 1.6	8/15-9/15	1/4 to 1 1/2
Cereal Rye, Winter ( <i>Secale cereale</i> )	55	1	55	1	7/15-10/15	1/4 to 1 1/2
Oats ( <i>Avena sativa</i> )	30	0.9	45 to 60	1.4 to 1.9	4/10-9/1	1/2 to 1 1/2
Wheat, Winter ( <i>Triticum aestivum</i> )	50	0.8	70 to 90	1.2 to 1.5	8/1-10/1	1/4 to 1 1/2
Triticale, Winter ( <i>Triticum</i> x <i>Secale</i> )	50	1.0	70 to 90	1.3 to 1.9	8/1-10/1	1/4 to 1 1/2
NON-LEGUMES BROADLEAF						
*Buckwheat ( <i>Fagopyrum esculentum</i> )	20	0.4	35	0.7	5/15-8/1	1/2 to 1
**Oilseed Radish ( <i>Raphanus sativus</i> )	4	—	12	—	4/10-6/15, 7/15-8/15	1/2 to 3/4
*Sunflower ( <i>Helianthus annuus</i> ) (part of a mix)	1	—	2	—	6/1-7/15	1 to 1 1/2
*Chicory ( <i>Cichorium intybus</i> ) (part of a mix)	1	—	2	—	4/10-6/1, 8/1-9/1	1/2 to 3/4
Rapeseed/Canola ( <i>Brassica napus</i> )	2	—	6	—	4/10-6/15, 8/1-8/15	1/2 to 3/4
Forage Turnips ( <i>Brassica rapa</i> )	1	—	5	—	4/10-6/15, 7/15-8/15	1/2 to 3/4
LEGUMES						
Alfalfa ( <i>Medicago sativa</i> )	13	—	16	—	4/15-6/1, 8/1-8/30	1/4 to 1
Berseem Clover ( <i>Trifolium alexandrinum</i> )	9	—	17	—	6/1-8/1	1/2 to 3/4
*Cowpea ( <i>Vigna unguiculata</i> )	55	0.9	99	1.7	6/1-7/15	1 to 1 1/2
*Field Pea ( <i>Pisum sativum</i> )	65	2.6	100	4.0	4/10-6/15	1 to 1 1/2
Hairy Vetch ( <i>Vicia villosa</i> )	15	—	20	—	4/10-6/15, 7/15-9/15	1 to 1 1/2
*Peas, Winter ( <i>Pisum sativum</i> subsp. <i>arvense</i> )	65	2.6	100	4.0	8/1-9/1	1 to 1 1/2
Red Clover ( <i>Trifolium pratense</i> )	9	—	13	—	4/10-8/15	1/2 to 3/4
White Clover ( <i>Trifolium repens</i> )	7	—	9	—	4/15-6/1, 8/1-8/30	1/2 to 3/4
Crimson Clover ( <i>Trifolium incarnatum</i> )	11	—	17	—	6/1-8/1	1/2 to 3/4

1 Incorporated seed—Seeding methods used that provide good seed to soil contact (drilled, no-tilled or broadcast and incorporated).

2 Non-incorporated seed—Seeding methods used when broadcasting seed without mechanical incorporation (aerial, over-seeding/inter-seeding and frost seeding).

Cover crop seed mixture designs must include a minimum of 1 pound of seed per species planted.

Note: lbs./bu./ac. represent the numbers in sequence in the Table. For example: 15/0.7 refers to 15 lbs. or 0.7 bushel per acre.

\* Species with asterisk are not recommended for aerial seeding. Large seed legumes (cowpea, etc.) and summer annuals (Japanese millet, etc.) require adequate seed to soil contact.

\*\* Spring seeding of oil seed radish must include the termination strategy to prevent the production of viable seed.



September 2016 Field Day at Brickstead Dairy.



# Cover Crops and Effective Weed Control

Steve Keil & Loree Johnston LaChey, Country Visions Cooperative

## SUMMARY

- A situation that is becoming much worse in Northeast Wisconsin is the increase in the presence of resistant weeds in many fields. Although cover crops can be part of the solution in dealing with this problem there are times when glyphosate (eg. Roundup PowerMax) might not be effective if glyphosate resistant weeds are in the field. An example is the rapid increase of glyphosate resistant waterhemp in the region.
- It is highly advised that all your fields are scouted and a weed survey be taken to determine not only what weeds are present but also any you are having difficulty controlling. If resistant weeds are present work closely with your consultant or agronomist to determine effective modes of action if herbicides are used and all other control strategies.



Giant ragweed seedling



Giant ragweed



Giant ragweed



Waterhemp

## CONSIDERATIONS

- Cover crops can be an aid in suppressing weed development but one shouldn't always expect complete suppression or control. You may get a high level of suppression as has been shown by some university trials. If you have resistant weeds present you want to do whatever is possible to prevent weed seed production. So, knowing where you have resistant weeds in your field(s) could be important so you can take steps to reduce the risk of resistant weed seed production.
- On known fields with glyphosate resistant waterhemp or other broadleaf weeds going to a two pass system in soybeans can be possible effective strategy. Putting a residual herbicide down at planting and following up in season postemergence with a contact kill and/or residual herbicide to control the problem weed species. Depending on what herbicides are used this may restrict your cover crop options after harvest but you still might be able to plant a cover crop to help suppress the resistant weed species but your use of the cover crop may be limited (for example not for forage).



Waterhemp



Waterhemp



Waterhemp



Waterhemp



# No-Till Planter Setup

## Wiese Brothers Farm & Country Visions Cooperative

### No-Till Coulters

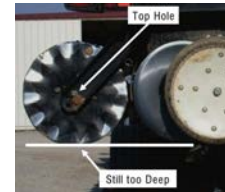
#### No-Till Coulters: Excerpts from *Successful Opening, Closing The Seed Slot With No-Till Planters And Drills*

By Phil Needham Needham Ag Technologies, LLC. [www.needhamag.com](http://www.needhamag.com)

- Many successful no-tillers have removed their no-till coulters. This is a difficult step for some, but by removing one coulters and observing the results, many producers soon remove them all. The only situation where I have seen a no-till coulters to benefit is when planting into sod, where the dense mat of surface material confines the performance of the double-disc openers.
- One of the problems which results from the use of no-till coulters includes throwing soils out of the seed zone. This presents problems because it can lower the seed zone, which can cause ponding within the rows - especially within high rainfall areas. When soil is thrown out of the seed slot, it also makes it difficult to gather soil back up to press around the seed and close the slot. When soil is thrown out of the seed zone, it can also cause the gauge wheels to ride up and compromise seeding depth consistency. This results in some of the seeds being positioned too shallow in the soil, without enough soil to cover them. Bouncing of the gauge wheels can also translate into unit vibration and seed losses from the meter.
- Another problem with no-till coulters is that they can produce a false floor in the bottom of the seed slot, which leads to poor seed to soil contact and reduced emergence. This is common in dry areas and is compounded by the fact that some brands (and models) of planter do not allow the no-till coulters to be raised up above the lower working depth of the double disc openers. The image (right) illustrates one example. It's a Kinze 2600 and even when the no-till coulters is positioned in the top hole, the bottom of the no-till coulters is still deeper than the bottom of the double-disc opener. The solution to raise the Kinze no-till coulters up higher is to place washers or a piece of flat-bar (with holes drilled in it), under the lower side of the coulters mounting bracket. This will push the no-till coulters forward and raise it slightly.



Sharp properly adjusted seed openers are important



### Planter Setup Considerations



More aggressive furrow closing "Furrow Cruisers"

#### Why Focus On Down Force Control?

Get An Average **11+** Bushel Per Acre Advantage With DeltaForce

- Third Party 5-Year Study\*



Floating row cleaners are a must to move residue



# No-Till Alfalfa into Rye

Nate Nysse, Tilth Agronomy

## Advantages of Interseeding Alfalfa into Rye

- Provides cover between corn silage and alfalfa establishment.
- Helps remove soil moisture and excess Nitrogen in spring.
- Prevents P losses with soil loss from wind erosion heavy rainfall events and dead soils in spring.
- Provides additional feed.
- Harvest at early boot stage for high quality or harvest late for low quality.
- Can add grasses to increase new seedling alfalfa tonnage for first cutting.

**Winter Rye and Triticale can tolerate Wisconsin winters.**



**Winter Rye or Triticale can be made into high or low quality feed.  
Provides Natural Weed Suppression.**



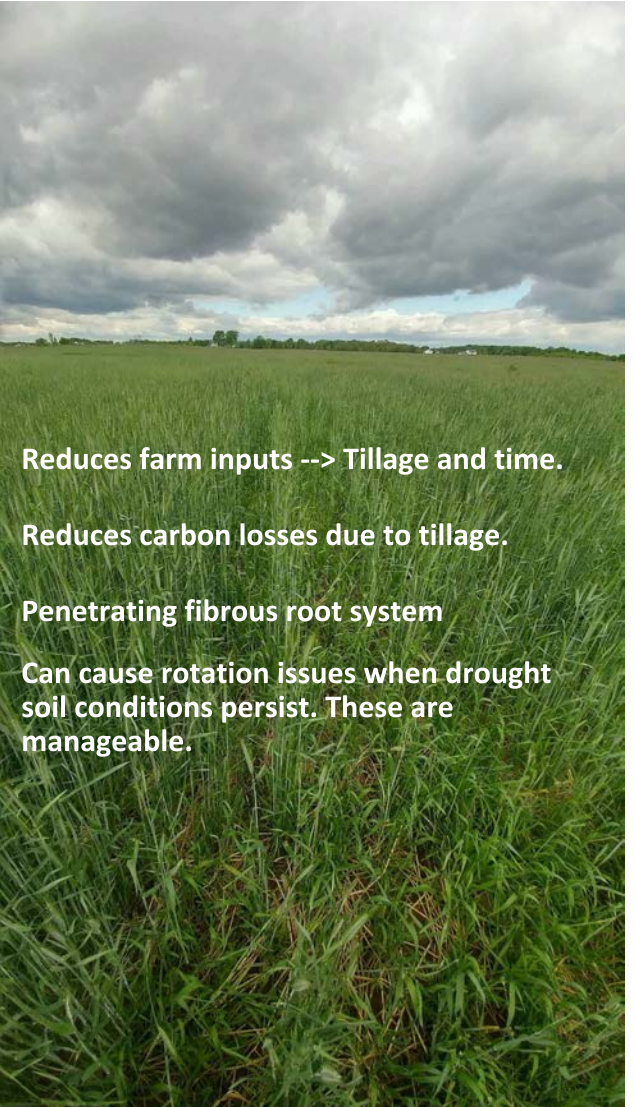
**Provides an option for manure applications in early summer.**



**Reduces loss of P and soil.**



## Demonstrations in Northeast WI



**Reduces farm inputs --> Tillage and time.**

**Reduces carbon losses due to tillage.**

**Penetrating fibrous root system**

**Can cause rotation issues when drought soil conditions persist. These are manageable.**

