

# FARMING IN NATURE'S IMAGE

YOU CAN'T ARGUE WITH MOTHER NATURE

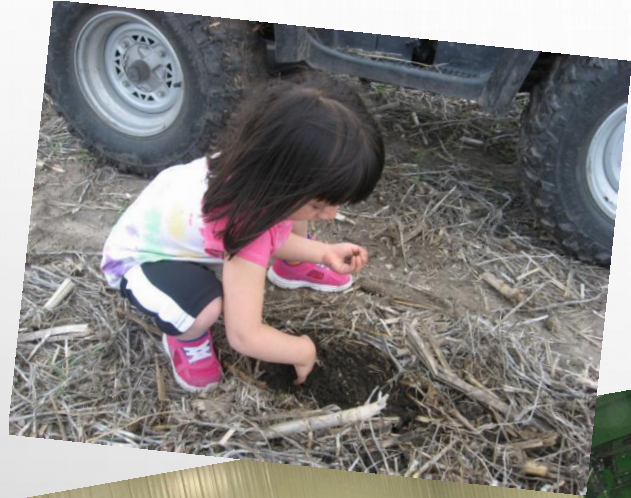


# MY FARMING HISTORY

- 6<sup>TH</sup> GENERATION FARMING IN HUMBOLDT
- 1993 WAS MY 1<sup>ST</sup> YEAR FARMING (20+ YEARS NOW)
  - WORKING WITH NEIGHBOR
- TRANSITIONED TO NO-TILL/STRIP-TILL EARLY 2000'S
  - HAD MY OWN EQUIPMENT
- STARTED USING COVER CROPS THE FALL OF 2012
- USING COVER CROPS ON MOST OF MY ACRES NOW
  - 510 ACRES SEEDED LAST FALL (OUT OF 660 TOTAL)
  - ADDITIONAL 400 ACRES FARMED IN 50/50 PARTNERSHIP



# WHY I CARE ABOUT SOIL HEALTH/QUALITY



- FUTURE GENERATIONS WILL NEED TO USE THE FEW REMAINING INCHES OF RICH TOPSOIL THAT WE HAVE TO FEED MORE PEOPLE THAN ARE ON THE PLANET TODAY.
- ARE WE USING OUR SOIL TO MAKE A PROFIT TODAY AND NOT THINKING ABOUT HOW WE ARE LEAVING THE SOIL RESOURCE FOR FUTURE GENERATIONS?



# CAN YOU BUILD A HOME IN A WEEK? NEITHER CAN YOUR SOIL BIOLOGY!



Come on people, lets do this!  
Cover crops provide many  
benefits, soil health improves,  
better water infiltration, weed  
control and nutrient recycling!





# HEALTHY SOIL: WILL RESIST EROSION, COMPACTION, & WILL BE MORE EFFICIENT WITH NUTRIENTS

- HOW TO IMPROVE SOIL HEALTH
- IMPROVE SOIL STRUCTURE
  - TILLAGE DESTROYS SOIL STRUCTURE
  - SOIL STRUCTURE RESISTS COMPACTION
- INCREASE INFILTRATION
  - REDUCE RUNOFF/NUTRIENT LOSS/SOIL LOSS
  - WATER AVAILABILITY IN DRY PERIODS
- PLANT DIVERSE CROPS
  - CROP ROTATION OR COVER CROPS SPECIES
- SOIL TEST (NUTRIENTS & SOIL HEALTH)
  - SLAKE TEST (JAR TEST) OR NRCS SOIL HEALTH BUCKET
  - HANEY SOIL HEALTH TEST (CAN BE TAKEN WITH SOIL SAMPLES)



# JAR SLAKE TEST

- EASY WAY TO SHOW HOW SOIL STRUCTURE RESISTS EROSION

CONVENTIONAL TILL

STRIP-TILL/NO-TILL

BROME GRASS IN GROVE





# MY GOALS FOR IMPROVED SOIL STRUCTURE

- FASTER WATER INFILTRATION
  - LESS RUNOFF
- WATER AVAILABILITY IN DRY PERIODS
- EQUIPMENT CARRYING CAPACITY
  - LESS COMPACTION
- RESIDUE DECOMPOSITION
  - HEALTHY SOIL REDUCES RESIDUE
- MORE STABLE YIELDS



# COVER CROPS IN NORTH CENTRAL IOWA

TERMINATE EARLY IF THIS  
IS WHAT YOU WANT



TERMINATE LATER IF THIS  
IS WHAT YOU WANT



REPEAT ANNUALLY FOR  
IMPROVED SOIL HEALTH





# COVER CROPS ON MY FARM

- I PLANTED CEREAL RYE AFTER SOYBEAN HARVEST IN 2012.
- I WANTED TO SEE WHAT A COVER CROP COULD OFFER
- BEST WAY TO LEARN HOW TO MANAGE IT IS TO TRY IT.
- IF YOU DON'T DO IT NOW, YOU WILL HAVE TO WAIT ANOTHER YEAR. PLAN AHEAD, BE READY.
- YOU WILL LEARN SOMETHING THE FIRST YEAR SO YOU CAN MAKE IT BETTER IN THE SECOND YEAR.
- WHAT I LEARNED THE FIRST YEAR
  - I SHOULD HAVE SEEDED IMMEDIATELY AFTER HARVEST, MISSED RAIN AND EARLY GROWTH
    - GOOD GROWING DAYS WERE LOST LINING UP SEED AND COST SHARE
  - USE CAUTION WHEN SPRAYING 32% N WITH YOUR BURNDOWN HERBICIDE IN THE SPRING
  - SHOULD HAVE INCREASED SEEDING RATE, TO GET MORE BENEFIT FROM LATE SEEDING

# 2014 COVER CROP MIXES

WINTER TERMINATED — OATS, RADISH,  
CRIMSON CLOVER



WINTER HARDY- CEREAL RYE

MAY 4<sup>TH</sup> 2015(WARM SPRING)





# WHAT IF IT RAINS AND I DON'T TERMINATE EARLY AS ORIGINALLY PLANNED?

MAY 21<sup>ST</sup>, ABOUT 3' TALL



JUNE 2<sup>ND</sup>, ABOUT 5' TALL



Rye will keep growing.....and growing....



# ROLLED RYE AFTER PLANTING CREATING THICK MULCH

EXCELLENT SEED BED



EXCELLENT STAND AND SOIL CONDITIONS



JULY 21<sup>ST</sup> MULCH HOLDING WEEDS-NO HERBICIDE POST-EMERGE





# THE END RESULT : 2015 YIELD 58.6 BU/AC

OCTOBER 7<sup>TH</sup> FIELD STILL CLEAN



NOVEMBER 8<sup>TH</sup> STRIP-TILLING  
INTO RYE & BEAN STRAW





# 2015 CEREAL RYE AND RADISH AERIALY SEEDED BEFORE HARVEST





# SPRING 2016 COVER CROPS



AHEAD OF  
CORN

MOST  
CEREAL RYE  
TERMINATED  
EARLY, WAS  
6-8" TALL

NOW VERY  
LITTLE  
CEREAL RYE  
RESIDUE  
REMAINS

ROLLED RYE AFTER PLANTING WHEN BEANS  
HAD FIRST TRIFOLIATE. GOAL WAS TO  
INCREASE RESIDUE ON SURFACE TO  
COMBAT WEEDS LIKE WATERHEMP





# 2016 FALL COVER CROP SEEDING

AUGUST 27 SEEDED WITH A  
HAGIE SPRAYER SET UP FOR  
INTERSEEDING COVER CROPS



MIXING IT UP WITH DIFFERENT  
SEEDING METHODS

- AUGUST 27 INTERSEEDED GROUND APPLIED
  - 1.5 BU CEREAL RYE
  - 2# RAPE & 2# HAIRY VETCH
- SEPTEMBER 30 AERIALY SEEDED
  - 1.5 BU ON CORNSTALKS GOING TO BEANS
  - 1 BU ON SOYBEANS GOING TO CORN
  - RADISH OR RAPE INCLUDED ON ALL MIXES



# WHAT A DIFFERENCE A WARM SPRING CAN MAKE

MAY 2, 2015 VS MAY 13, 2013





# TERMINATION: OFTEN FEARED NEED TO UNDERSTAND DETAILS

1. SPRAY WHEN WARM  
(ACTIVELY GROWING NOT  
LATE IN DAY)

2. USE CAUTION IF USING  
32% NITROGEN VS WATER

3. AS WEATHER WARMS,  
GLYPHOSATE RATES CAN  
STAY THE SAME VS  
EARLY/COLD/SMALL RYE



90' BOOM = LONG HOSES  
STILL HOLD PREVIOUS SPRAY MIX





# RESULTS NOT ALWAYS AS GOOD AS YOU EXPECT

HARVEST TIMING/CORN MATURITY



The earlier you harvest the more sun the cover crop receives = better growth

SPOTTY AERIAL SEEDING???





# TILLING YOUR COVER CROPS IS LIKE BEING MARRIED AND STILL HAVING A GIRLFRIEND, TO GET BENEFITS YOU CAN'T HAVE IT BOTH WAYS



- NEED TO DISCUSS GOALS WITH PRODUCER
  - IF SOIL HEALTH, TILLAGE DOESN'T ACCOMPLISH GOALS
- WHAT IS THEIR CROP ROTATION
- “GREEN MANURE” OR “PLOW DOWN”
  - SHORT TERM GAIN-LONG TERM LOSS?
- IS TILLAGE THE PLANNED METHOD OF TERMINATION?



# USING COVER CROPS TO REDUCE HERBICIDES (THINGS I HAVE LEARNED)



# WEEDS ARE OPPORTUNISTIC

WATERHEMP GROWING  
IN OPEN AREAS



PRE-EMERGE HERBICIDE APPLIED





# CHEMICAL TEST

BURNDOWN ONLY



BURNDOWN AND PRE-EMERGE



# CEREAL RYE RESIDUE TO HELP REDUCE HERBICIDE USE

BEST IF YOU HAVE AN EVEN  
STAND OF RYE TO PLANT INTO



TALLER RYE PROVIDES MORE  
RESIDUE WHICH LASTS LONGER





# ROLLING RYE

- 1) TO GET SUNLIGHT TO CROP
- 2) INCREASES RESIDUE COVERING THE SOIL

ROLLING GREEN RYE AFTER  
PLANTING SOYBEANS MAY 25



ROLLING RYE AFTER SOYBEANS  
1<sup>ST</sup> TRIFOLIET JUNE 7, 2016



# TALLER RYE = MORE RESIDUE = MORE WEED CONTROLLING MULCH

3 FOOT TALL HIGH RYE



5 FOOT TALL RYE





# SEASON LONG WEED CONTROL



# COVER CROP ECONOMICS

## COVER CROP INVESTMENT

- 2012 RYE W/ FERTILIZER \$26.50
- 2013 RYE/RADISH FLY ON \$32.16
- 2014 RYE/RADISH FLY ON \$41.30
- 2014 OAT/RADISH/CLOVER FLY ON \$38.25
- 2015 RYE/RADISH W/ FERTILIZER \$29.01
- 2015 RYE/RADISH FLY ON \$38.05
- AVERAGE \$34.21/ACRE

## TYPICAL TILLAGE PROGRAM

- ISU CUSTOM RATES
- CHOPPING CORNSTALKS \$11.90
- SUBSOILING \$20.10
- FIELD CULTIVATOR \$14.05
- TOTAL \$46.05/ACRE
- COSTS+\$11.84/ACRE MORE TO USE THIS TILLAGE PROGRAM



# TIMES HAVE CHANGED MAYBE IT'S TIME YOU DO TOO?

- PHOTO FROM 1950'S
- LONG TERM CROP ROTATION WITH HAY
- PROBABLY INCLUDED MANURE
- MIGHT BE THE SAME FIELD, BUT EVERYTHING ELSE HAS CHANGED
  - "IT'S THE WAY WE HAVE ALWAYS DONE IT"
  - DOING THE SAME THING AND EXPECTING DIFFERENT RESULTS = INSANITY



500+ HP

330 GALLONS FUEL

26.7 GAL/HR

PULLING A SOIL STRUCTURE DESTROYER  
MIXING AIR AND RESIDUE INTO THE SOIL  
CREATING THE PERFECT FLUFFY GARDEN SEEDBED



Having to repeat the process every year to remove ruts created due to lack of soil structure



# SAMPLING TO FINE TUNE NITROGEN RATES

## IF YOU DON'T SAMPLE HOW CAN YOU TELL HOW YOU ARE DOING FOR YOUR CROP OR ENVIRONMENT

### FALL CORN STALK TEST FOR NITRATES



### ADDITIONAL TESTS

- LATE SPRING SOIL NITRATE TEST
  - 6-12" CORN BEFORE SIDE DRESSING
- LEAF TISSUE TESTING
- TILE WATER
  - CATCH AT OUTLET OR PUMP UP INTAKE TO COLLECT SAMPLE
  - RUN SAMPLES ON SOIL SCAN 360

# NITROGEN MANAGEMENT

## NO EASY ANSWERS

### SPRING TEST

- BEFORE SIDE DRESS CHECKED TILE WATER
  - 18 PPM NITRATES IN WATER
    - SOYBEAN STUBBLE FALL STRIP TILL 27#N
    - CEREAL RYE COVER CROP
- LSNT TO DETERMINE SIDE DRESS RATES
  - 6 PPM NITRATES IN SOIL
  - 25-28 PPM NEEDED TO GROW CORN
- LATE SEASON NITROGEN
  - Y-DROP APPLICATION WHEN CORN IS TASSELING

### FALL TEST

- END OF SEASON CORNSTALK TEST
  - 15-8" STALK SAMPLE, 6" ABOVE GROUND
  - LOW LESS THAN 250 PPM N
    - MOST SAMPLES IN 40-450 RANGE
  - MARGINAL 250-700 PPM N
  - OPTIMAL 700-2000 PPM N
  - EXCESS OVER 2000 PPM N



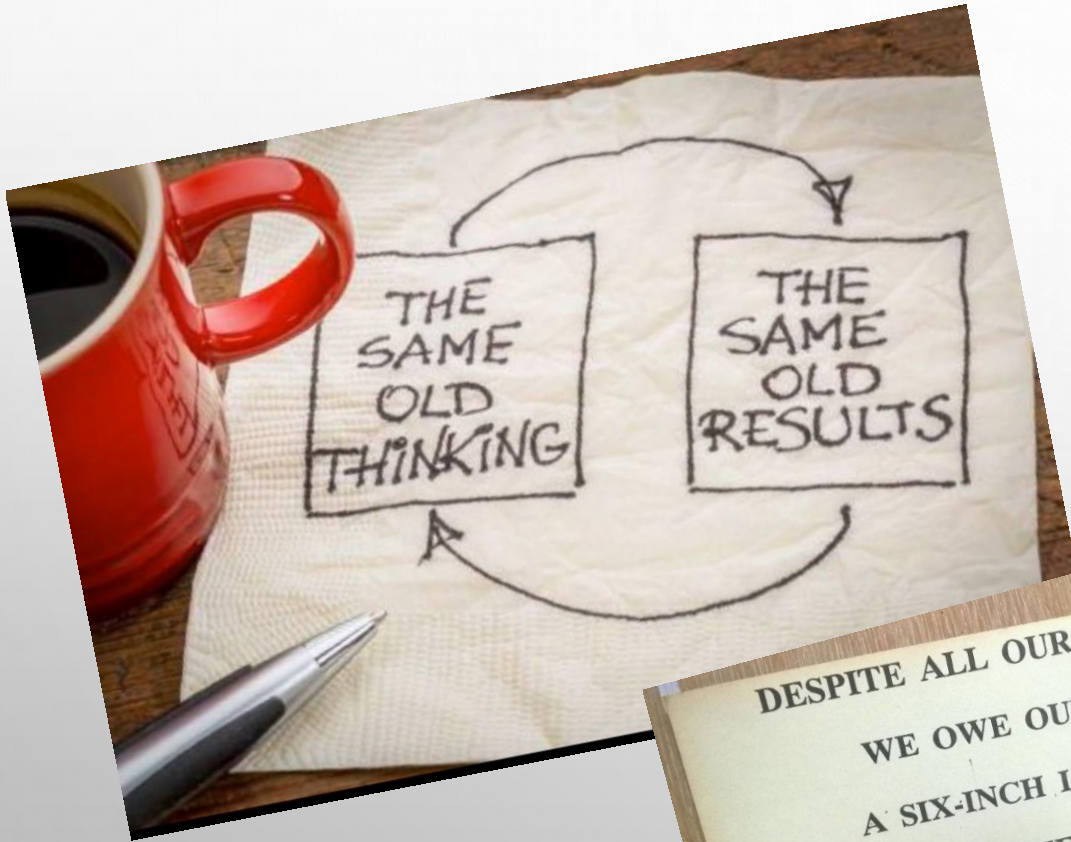
# WHAT I'VE LEARNED

- COMPLICATED ISSUE
- NEED TO SAMPLE TO MEASURE WHERE YOU ARE AT FOR YOUR NUTRIENT PROGRAM
- WEATHER EFFECTS TRUMP YOUR PLAN
- HAVE MULTIPLE OPTIONS
  - NUTRIENT TIMING AND RATES
  - COVER CROP SPECIES AND SEEDING METHODS
  - SOIL, LEAF, STALK TISSUE TESTING
- TAKE ACTION NOW
- TRY SOMETHING NEW
  - TILLAGE
  - COVER CROPS
  - NUTRIENT RATES, PRODUCTS, TIMING
  - SAMPLE SOIL, LEAF AND STALK TISSUE
- KEEP TRYING

# WHAT WILL YOU DO?

TO MAKE THE NUTRIENT  
REDUCTION STRATEGY  
WORK, EVERYONE NEEDS  
TO MAKE SOME  
IMPROVEMENT TO THEIR  
CURRENT FARMING  
SYSTEM.

THE TIME IS NOW





# FOLLOW ME ON TWITTER

## @FARMERDOUG93



# Reducing Herbicides

With

## Cover Crops



Wade Dooley

6<sup>th</sup> Generation

Albion, IA





Home Farm

© 2016 Google

Google Earth





Cattle



Row-crops

Small Grains



Hay





- 1<sup>st</sup> used cover crop (rye) in 1997
- Seeded following silage harvest
- Grazed Fall/Winter every year, for 10 years
- Began experimenting w/ different practices in 2008





2008 1<sup>st</sup> try over-seeding with 3-point broadcaster



2010 1<sup>st</sup> time aerial seeding with plane



2009 1<sup>st</sup> try at over-seeding w/ high-boy





**Cover crops:  
Better erosion control than tillage!**





**Scavenge available fertility, don't let it wash away**



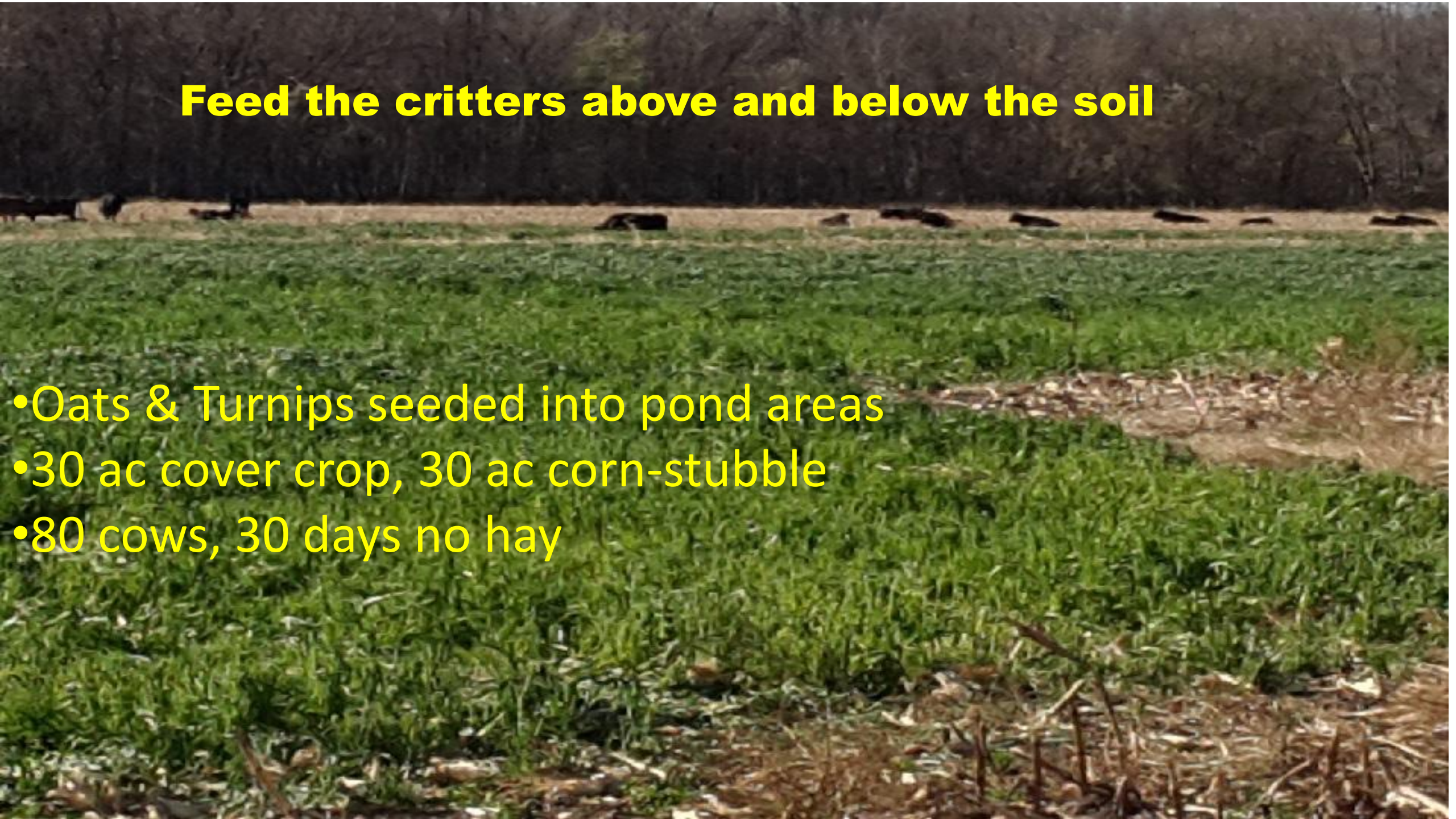
**Residual Nitrogen scavenged by Oats**

**Oats & Turnips  
Late-summer seeding**



## **Feed the critters above and below the soil**

- Oats & Turnips seeded into pond areas
- 30 ac cover crop, 30 ac corn-stubble
- 80 cows, 30 days no hay





# Weed control means different things to different people

Using cover crops to fill flooded-out spots during the growing season can greatly reduce weed pressure for next year!

**Oats & Radish**





**Cover crops seeded before harvest compete with winter annual weeds, reducing their ability to cause problems in the Spring.**



**Oats & Rape**



**6-way mix**





**Planting “Green” can provide early, mid, and some late-season weed control**

**Winter Wheat & Rape**





**Mid-season after  
planting “green”**





**Just before harvest, after planting “green”**





A red tractor with a white tank is parked in a field of yellow rapeseed flowers. The tractor is positioned in the middle ground, facing left. The field is filled with dense yellow flowers in the foreground and middle ground. In the background, there is a line of green trees under a bright sky. The text "Not all cover crops do the same job!" is overlaid in the center of the image.

**Not all cover crops do the same job!**

**Rapeseed**





Glenwood  
CENTURY FARM