Rick Clark
Steward
Change is Good!
- Purdue graduate Ag Econ
- 5th generation farmer
- 35 yrs practicing
- Wife: Carol for 30 yrs
- Daughters: Jessica and Rachel

- Clark Farm
- Father: Richard
- Nephew: Aaron
- No till soybeans for 15 yrs
- No till corn for 10 yrs
- Cover crops for 10 yrs
- Farming green for 8 yrs
- 5 crop rotation
- 100% transition to organic
- 100% non GMO all crops
- No starter fertilizer
- No fungicide
- No seed treatment
- No insecticide
Farm Green:

Planting the cash crop of corn and soybeans into a living, growing, green cover crop. Termination may not occur for up to 30 days after planting, but typically it has happened within 3-5 days.
Benefits of farming green:

Maximizing what the cover crop was intended to do.

- Sequestration of nutrients
- Nitrogen fixing
- Growing carbon
- Erosion control
- Increased pounds of biomass
- Feed microbes
- Armor the soil
- Limit evaporation
- Suppress weeds
## Nutrient Sequestration
### Cereal Rye

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>P2O5</th>
<th>0-46-0</th>
<th>K2O</th>
<th>0-0-60</th>
<th>Sulfur</th>
<th>Mg</th>
<th>Ca</th>
<th>Biomass</th>
</tr>
</thead>
<tbody>
<tr>
<td>12” rye</td>
<td>82</td>
<td>15</td>
<td>32</td>
<td>76</td>
<td>133</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>2000</td>
</tr>
<tr>
<td>18” rye</td>
<td>120</td>
<td>20</td>
<td>44</td>
<td>128</td>
<td>213</td>
<td>6</td>
<td>6</td>
<td>18</td>
<td>4000</td>
</tr>
<tr>
<td>28” rye</td>
<td>134</td>
<td>30</td>
<td>64</td>
<td>169</td>
<td>281</td>
<td>10</td>
<td>12</td>
<td>31</td>
<td>6800</td>
</tr>
<tr>
<td>Dead rye</td>
<td>84</td>
<td>29</td>
<td>64</td>
<td>39</td>
<td>65</td>
<td>3</td>
<td>11</td>
<td>29</td>
<td>3500</td>
</tr>
</tbody>
</table>

Note: Dead rye sample was taken 2 months after termination.
What drives our system?

- Building soil health
- Diversification
- Cash crop rotation
- Data collection
- Armor the soil
- Building human health
- Being a good steward
- ROI
Balance
A symbiotic relationship with mother nature.
Change is Good

Change is Necessary

Change is the Answer
Soil Health

30% less nutrient density than 25 yrs ago

8 oranges today to equal 1 orange 50 yrs ago.

Human Health
Prescription Tillage Technology. STP blade.

Martin Till spader wheel with depth blade.
WOMD #1
Against weeds
WOMD #2

Against chemicals
Gunslinger

30 lbs Haywire oats
5 lbs Austrian winter peas
5 lbs Balansa Fixation clover
3 lbs Sorghum/Sudan
3 lbs Tillage radish
Nutrient analysis of Gunslinger  
June 5\textsuperscript{th} 2019

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>P2O5</th>
<th>0-46-0</th>
<th>K2O</th>
<th>0-0-60</th>
<th>Ca</th>
<th>Mg</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>151</td>
<td>44</td>
<td>96</td>
<td>190</td>
<td>317</td>
<td>47</td>
<td>11</td>
<td>8</td>
</tr>
</tbody>
</table>

Note: 5840 lbs DM biomass per acre.
Planting corn “green” into Balansa Fixation clover and Austrian winter peas.
Frost Seeding
March 11th 2019

- 30 lbs Haywire Oats
- 8 lbs Balansa Fixation clover
- 2 lbs tillage radish
- 2 lbs Rape
- 2 lbs Chicory
- 2 lbs Hairy Vetch

- Note: Broadcast with Case IH Air max 70’ boom.
- Note: This can not be terminated mechanically.
Nutrient analysis of frost seeding
June 10th 2019

<table>
<thead>
<tr>
<th>N</th>
<th>P2O5</th>
<th>0-46-0</th>
<th>K2O</th>
<th>0-0-60</th>
<th>Ca</th>
<th>Mg</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>55</td>
<td>147</td>
<td>177</td>
<td>295</td>
<td>73</td>
<td>16</td>
<td>23</td>
</tr>
</tbody>
</table>

Note: 5538 lbs DM biomass per acre
The most efficient way to build soil health. High impact paddock grazing.
April 28th

Planting beans at boot stage has allowed us to move up our planting date by 30-40 days.
June 1st

Roll crimp cereal rye and soybeans at v2.
This field is in transition to organic. The concept of going organic while utilizing cover crops and no till excites me. This is a system we will need to continue perfecting.
June 26, 2019

Planted corn into alfalfa. The alfalfa was tilled with a disc. I will never do this again.

The plan moving forward will be no tilling corn into alfalfa and then flail chop when the corn is at v1 growth stage.
Organic corn. This is what can happen, if we have some patience. The organic corn fields were the cleanest fields on the farm in 2019.
If you are not uncomfortable with what you are doing, then you are not trying hard enough to change.

I challenge everyone here today to get a little uncomfortable. I think you will like how it feels.
I am proud to be a farmer.
But, I am more proud of the way I farm.

Regenerative Stewardship

Thank you.
Thoughts

Rick Clark

Rick@farmgreen.land

C: 765 585 2413
Rick Clark
Steward
Change is Good!
Good Data

↓

Good Decisions

↓

Position of Strength
Stability

Corn Yield Comparison

Soybean Yield Comparison

Standard Deviation
Before Cover Crops: 8.87
After Cover Crops: 2.75

Standard Deviation
Before Cover Crops: 28.39
After Cover Crops: 4.7
Our Soybean Yield Achieved

National Yield Achieved

y = 1.332x - 2620.3

y = 1.5043x - 2983
# Input Reductions

<table>
<thead>
<tr>
<th>Input</th>
<th>2011</th>
<th>2019</th>
<th>% change</th>
</tr>
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<tbody>
<tr>
<td>Diesel fuel</td>
<td>30,011 gal</td>
<td>15,151 gal</td>
<td>49.5</td>
</tr>
<tr>
<td>Horsepower</td>
<td>3350</td>
<td>1200</td>
<td>64.2</td>
</tr>
<tr>
<td>Synthetic N</td>
<td>220 lbs/A</td>
<td>110 lbs/A</td>
<td>50.0</td>
</tr>
<tr>
<td>MAP</td>
<td>330 tons</td>
<td>0</td>
<td>WOW!</td>
</tr>
<tr>
<td>Potash</td>
<td>400 tons</td>
<td>0</td>
<td>WOW!</td>
</tr>
<tr>
<td>Lime</td>
<td>2100 tons</td>
<td>0</td>
<td>WOW!</td>
</tr>
<tr>
<td>Chemistry</td>
<td>$40/A</td>
<td>$8/A</td>
<td>80.0</td>
</tr>
</tbody>
</table>
Money in your pocket!

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel fuel</td>
<td>$35,000</td>
</tr>
<tr>
<td>Synthetic N</td>
<td>$110,000</td>
</tr>
<tr>
<td>MAP</td>
<td>$138,000</td>
</tr>
<tr>
<td>Potash</td>
<td>$142,000</td>
</tr>
<tr>
<td>Lime</td>
<td>$53,000</td>
</tr>
<tr>
<td>Chemistry</td>
<td>$192,000</td>
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</table>

Total $670,000

Note: The total dollar amount is repeated every year.
## Low cost input producer

<table>
<thead>
<tr>
<th></th>
<th>NGMO corn</th>
<th>NGMO soybeans</th>
</tr>
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<tbody>
<tr>
<td>Seed</td>
<td>$75/A</td>
<td>$26/A</td>
</tr>
<tr>
<td>Cover crop</td>
<td>$30/A</td>
<td>$36/A</td>
</tr>
<tr>
<td>Chemistry</td>
<td>$14/A</td>
<td>$0/A</td>
</tr>
<tr>
<td>Synthetic N</td>
<td>$60/A</td>
<td>$0/A</td>
</tr>
<tr>
<td>Synthetic P,K</td>
<td>$0/A</td>
<td>$0/A</td>
</tr>
<tr>
<td>Fungicide</td>
<td>$0/A</td>
<td>$0/A</td>
</tr>
<tr>
<td>Insecticide</td>
<td>$0/A</td>
<td>$0/A</td>
</tr>
<tr>
<td>Roller crimper</td>
<td>$11/A</td>
<td>$11/A</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>$190/A</strong></td>
<td><strong>$73/A</strong></td>
</tr>
<tr>
<td><strong>B/E yield</strong></td>
<td><strong>43 bu/A</strong></td>
<td><strong>8 bu/A</strong></td>
</tr>
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</table>
## Income Statement Comparison

<table>
<thead>
<tr>
<th></th>
<th>Purdue Producer Expectations</th>
<th>Our Numbers</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield per Acre</td>
<td>206</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Estimated Sales Price</td>
<td>$3.75</td>
<td>$3.75</td>
<td></td>
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<tr>
<td>Gross Income</td>
<td>$772.50</td>
<td>$731.25</td>
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<tr>
<td><strong>Variable Costs</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td>$111.00</td>
<td>$84.00</td>
<td>-24%</td>
</tr>
<tr>
<td>Seed</td>
<td>$111.00</td>
<td>$72.00</td>
<td>-35%</td>
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<tr>
<td>Cover Crop Seed</td>
<td>$0.00</td>
<td>$20.00</td>
<td></td>
</tr>
<tr>
<td>Pesticides</td>
<td>$60.00</td>
<td>$18.00</td>
<td>-70%</td>
</tr>
<tr>
<td>Dryer Fuel</td>
<td>$37.00</td>
<td>$25.00</td>
<td>-32%</td>
</tr>
<tr>
<td>Machinery Fuel</td>
<td>$18.00</td>
<td>$10.00</td>
<td>-44%</td>
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<tr>
<td>Machinery Repairs</td>
<td>$22.00</td>
<td>$25.00</td>
<td>14%</td>
</tr>
<tr>
<td>Hauling</td>
<td>$21.00</td>
<td>$18.00</td>
<td>-14%</td>
</tr>
<tr>
<td>Insurance</td>
<td>$40.00</td>
<td>$20.00</td>
<td>-50%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$420.00</td>
<td>$292.00</td>
<td>-30%</td>
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<tr>
<td><strong>Contribution Margin</strong></td>
<td>$352.50</td>
<td>$439.25</td>
<td>25%</td>
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<tr>
<td><strong>Estimated Total Fixed Costs</strong></td>
<td>$383.00</td>
<td>$323.00</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cost</strong></td>
<td>$803.00</td>
<td>$615.00</td>
<td>-20%</td>
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<tr>
<td>Accounting Breakeven</td>
<td>224</td>
<td>147</td>
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</tr>
<tr>
<td>per Bushel BE</td>
<td>$3.90</td>
<td>$3.30</td>
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</table>
Thoughts to be aware of

- Start easy. Don’t get in over your head
- Do not plant wheat following beans in rolled rye
- Know your date for winter kill species
- Be aware of hard seed
- It is ok to shorten relative maturity of cash crop
- Do not underestimate the power of networking
- Scout fields. Stay on top of problems
- Keep plants attached
- Do not panic and ask for help
- Do not plant vns cereal rye
More thoughts…

- Collecting good data is critical to success
- Educate your landlords. Most will be supportive
- You need to view cover crop as important as cash crop
- Viewed as an outlier
- Continue to soil test
- Do whatever you can to have a cover on every acre
- Do not get hung up on yield
- Be patient, the soil starts to change at year 3
- Establish a baseline to monitor change
More thoughts…

- Delta Force
- Test on your own farm to see what works or does not work
- Remember, the people who are being talked about are the ones creating change. Change is good!
- Stop looking at single year ROI, take the average
You can’t do that…Oh yes I can!

- Sacrifice yield to maintain soil health
- Eliminate crop insurance
- Plant green into living cover crops
- Plant beans into 72” tall rye
- Plant corn into cereal rye
- It’s ok to have 12 plans
- Slow down and look for validations
- Park your planter no matter the date
- Don’t plant corn in April again
- Plant around moth flights
Cocktails for first timers

- Corn: oats, sorghum/sudan, radish
- Beans: cereal rye, sorghum/sudan, radish
- Add diversity when you are ready
- Don’t give up
<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
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</thead>
<tbody>
<tr>
<td>Crop</td>
<td>corn</td>
<td>wheat</td>
<td>alfalfa</td>
<td>corn</td>
<td>beans</td>
<td>regen</td>
</tr>
<tr>
<td>Crop</td>
<td>corn</td>
<td>wheat</td>
<td>graze</td>
<td>corn</td>
<td>beans</td>
<td>spclty</td>
</tr>
<tr>
<td>Crop</td>
<td>beans</td>
<td>regen</td>
<td>corn</td>
<td>wheat</td>
<td>alfalfa</td>
<td>corn</td>
</tr>
<tr>
<td>Crop</td>
<td>beans</td>
<td>regen</td>
<td>graze</td>
<td>corn</td>
<td>wheat</td>
<td>spclty</td>
</tr>
</tbody>
</table>
Thoughts

Rick Clark

Rick@farmgreen.land

C: 765 585 2413
Grazing livestock
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>10</td>
<td>21</td>
<td>71</td>
<td>118</td>
<td>19</td>
<td>10</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: 1000 lbs DM biomass per acre
June 29th 2019
Row mow.

Mowing cover crop and weeds in between the cash crop. This excites me for no till organic.
June 21st 2019

First run of the row mow. It is not a silver bullet, but it is a nice addition to the toolbox.
These nodules validate soil health.
Pollinator strips

We must do all we can to provide habitat for the bees and the butterflies, the song birds and all other beneficial pollinators. They are essential if we want to achieve balance.

1 out of 3 bites of food is attributed to pollinators.
Pollinator Palluza

3 Buckwheat
1 Chick pea
1 Common vetch
1 Flax
1 Crimson clover
1 Phacelia
2 Rape
2 Sunflower
2 Berseem frosty clover

1 Lentil
2 Yellow mustard
2 Yellow sweet clover
1 Radish
2 Sunn hemp
1 4010 peas
5 Haywire Oats
2 Balansa Fixation clover
Rolling cereal rye ahead of the soybean planter. We did this because the rye was over 72” tall and it lodged. Again, constantly being flexible to change plans.
July 22nd 2019

Transition soybeans to organic.
Weed suppression has been pretty good.