





- **Clark Land and Cattle**
- **No till soybeans for 21 yrs**
- **No till corn for 16 yrs**
- **Cover crops for 16 yrs**
- **Farming green for 14 yrs**
- **Epigenetics for 6 yrs**
- **Bio stimulants for 3 yrs**
- **On site bio reactors for 3 yrs**



- **9 crop system / plus 1**
- **5600 acres certified organic**
- **Remainder of acres in transition**
- **No starter fertilizer in 11 years**
- **No fungicide in 11 years**
- **No seed treatment in 11 years**
- **No insecticide in 11 years**
- **No P or K in 11 years**
- **No ag lime applied in 11 years**
- **No Nitrogen applied in 6 years**
- **Organic with no tillage**

**Take advantage of the free stuff !!**



**The energy from the sun is powerful and it is free.**

# Nutrient Sequestration

## Cereal Rye

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

**Note: Dead rye sample was taken 2 months after termination.**

# The Power of Cereal Rye

	<b>N</b>	<b>\$ N</b>	<b>18-46-0</b>	<b>\$ P</b>	<b>0-0-60</b>	<b>\$ K</b>	<b>Total \$\$</b>
<b>12" rye</b>	<b>82</b>	<b>\$91.02</b>	<b>32</b>	<b>\$36.48</b>	<b>133</b>	<b>\$101.06</b>	<b>\$228.56</b>
<b>18" rye</b>	<b>120</b>	<b>\$133.20</b>	<b>44</b>	<b>\$50.16</b>	<b>213</b>	<b>\$161.88</b>	<b>\$345.24</b>
<b>28" rye</b>	<b>134</b>	<b>\$148.74</b>	<b>64</b>	<b>\$72.96</b>	<b>281</b>	<b>\$213.56</b>	<b>\$435.26</b>
<b>Dead rye</b>	<b>84</b>	<b>\$93.24</b>	<b>64</b>	<b>\$72.96</b>	<b>65</b>	<b>\$49.40</b>	<b>\$215.60</b>

**100 lbs of rye @ .29/lb = \$29/a**

**N = \$1.11/lb**

**P = \$1.14/lb**

**K = \$0.76/lb**

**August 1, 2022**

**Nitrogen is all around us and it is free.**

**The air we breathe contains 78.1% N<sub>2</sub>**

**Capture some of that N with legumes**

# The power of Balansa Fixation clover

	<b>N</b>	<b>P2O5</b>	<b>K2O</b>	<b>Ca</b>	<b>Mg</b>	<b>S</b>	<b>B</b>	<b>Mn</b>	<b>Zn</b>	<b>Biomass</b>
<b>May 20, 2020</b>	<b>75</b>	<b>30</b>	<b>138</b>	<b>28</b>	<b>6</b>	<b>6</b>	<b>11</b>	<b>95</b>	<b>26</b>	<b>3,800</b>
<b>June 4, 2020</b>	<b>114</b>	<b>56</b>	<b>213</b>	<b>61</b>	<b>12</b>	<b>9</b>	<b>15</b>	<b>80</b>	<b>26</b>	<b>6,800</b>
<b>June 8, 2020</b>	<b>262</b>	<b>87</b>	<b>444</b>	<b>228</b>	<b>40</b>	<b>33</b>	<b>35</b>	<b>46</b>	<b>28</b>	<b>12,700</b>
<b>July 24, 2020</b>	<b>52</b>	<b>15</b>	<b>24</b>	<b>46</b>	<b>7</b>	<b>4</b>	<b>9</b>	<b>40</b>	<b>19</b>	<b>5,400</b>

**June 8<sup>th</sup> sample:**

**Organic carbon 5200 lbs/a**  
**C:N 20:1**

# The Power of Legume Cocktails

	N	\$ N	18-46-0	\$ P	0-0-60	\$ K	Total \$\$
May 20	75	\$83.25	65	\$74.10	177	\$134.52	\$291.87
June 4	114	\$126.54	122	\$139.08	267	\$202.92	\$468.54
June 8	262	\$290.82	189	\$215.46	610	\$463.60	\$969.88
July 24	52	\$57.72	33	\$37.62	32	\$24.32	\$119.66

Cocktail cost = \$33/a

N = \$1.11/lb

P = \$1.14/lb

K = \$0.76/lb

August 1, 2022

# Epigenetics

**Heritable phenotype changes that do not involve alterations in the DNA sequence. These phenotypic trait changes may result from external or environmental factors or be part of normal development.**

# Maslin

**A mixture composed of different species of grains. We are doing this with rye, barley, and wheat. This is a 3,000 year old tradition.**

# Input Reductions

<b>Input</b>	<b>2011</b>	<b>2023</b>	<b>% change</b>
<b>Diesel fuel</b>	<b>30,011 gal</b>	<b>16,147 gal</b>	<b>46.2</b>
<b>Horsepower</b>	<b>3350</b>	<b>1200</b>	<b>64.2</b>
<b>Synthetic N</b>	<b>220 lbs/A</b>	<b>0</b>	<b>WOW!</b>
<b>MAP</b>	<b>330 tons</b>	<b>0</b>	<b>WOW!</b>
<b>Potash</b>	<b>400 tons</b>	<b>0</b>	<b>WOW!</b>
<b>Lime</b>	<b>2100 tons</b>	<b>0</b>	<b>WOW!</b>
<b>Chemistry</b>	<b>\$74/A</b>	<b>0</b>	<b>WOW!</b>

# Money in your pocket!

<b>Diesel fuel</b>	<b>\$ 62,000</b>
<b>Synthetic N</b>	<b>\$ 605,000</b>
<b>MAP</b>	<b>\$ 334,000</b>
<b>Potash</b>	<b>\$ 347,000</b>
<b>Lime</b>	<b>\$ 126,000</b>
<b>Chemistry</b>	<b>\$ 483,000</b>
<b>Seed</b>	<b>\$ 750,000</b>

**Total \$ 2,707,000**

**Note: The total dollar amount is repeated every year.**

**August 1, 2022**

# Thoughts

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