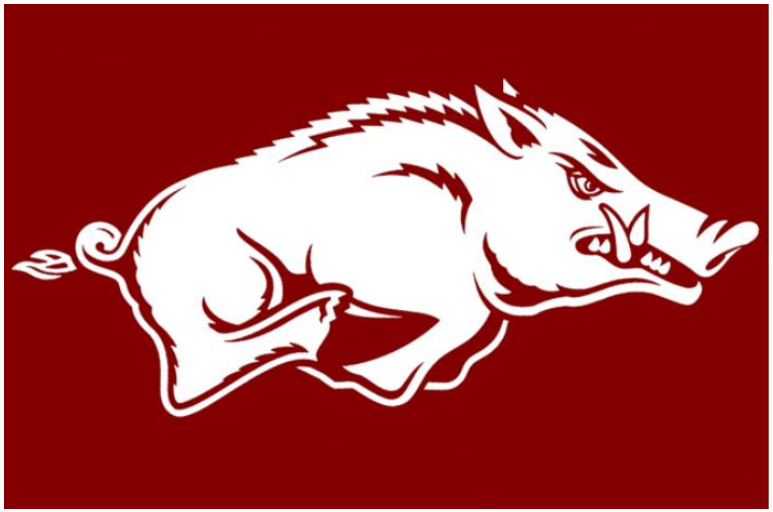
Increasing Profitability Through Diversity

My Experiences With Cover Crops and No-Till

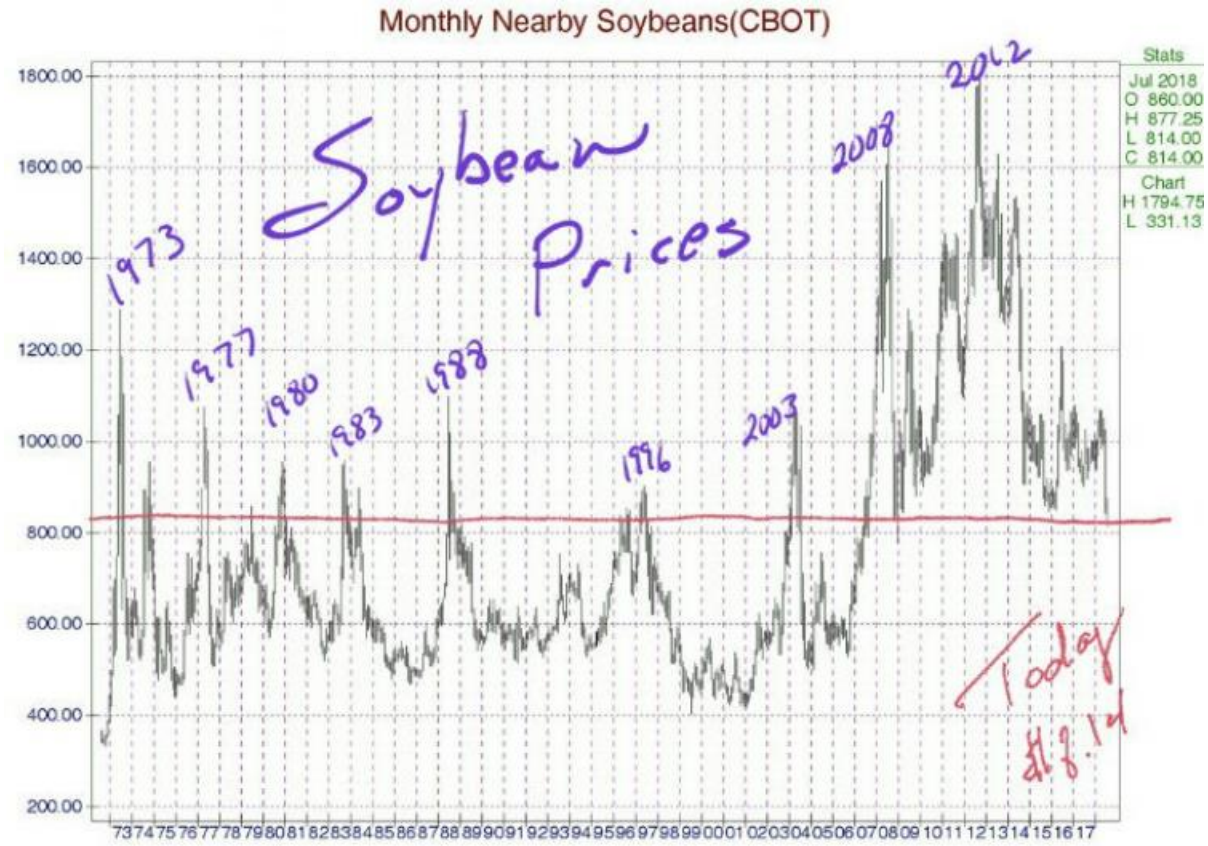
Adam Chappell

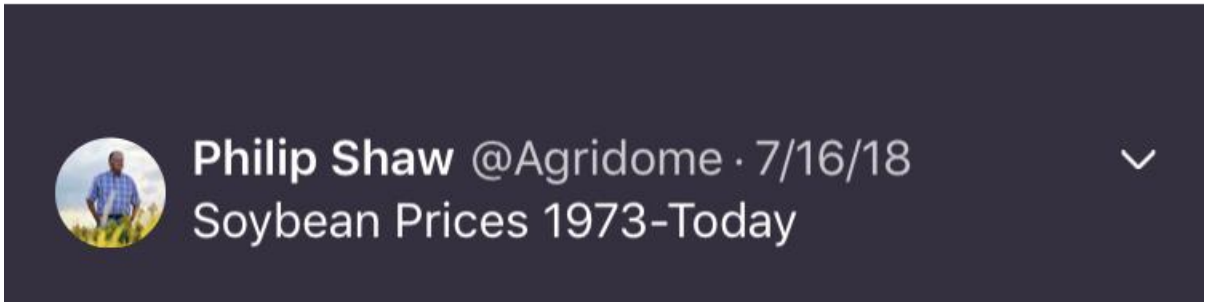
- I'm a fourth generation farmer
- Farm around 8000 acres at Cotton Plant AR with my brother Seth
- Try to have 7000+acres planted to covers
- Started experimenting with covers 2010
- Our yields are competitive for our area
- Make the crop with 50%-60% of $ than our neighbors
- Why and How?

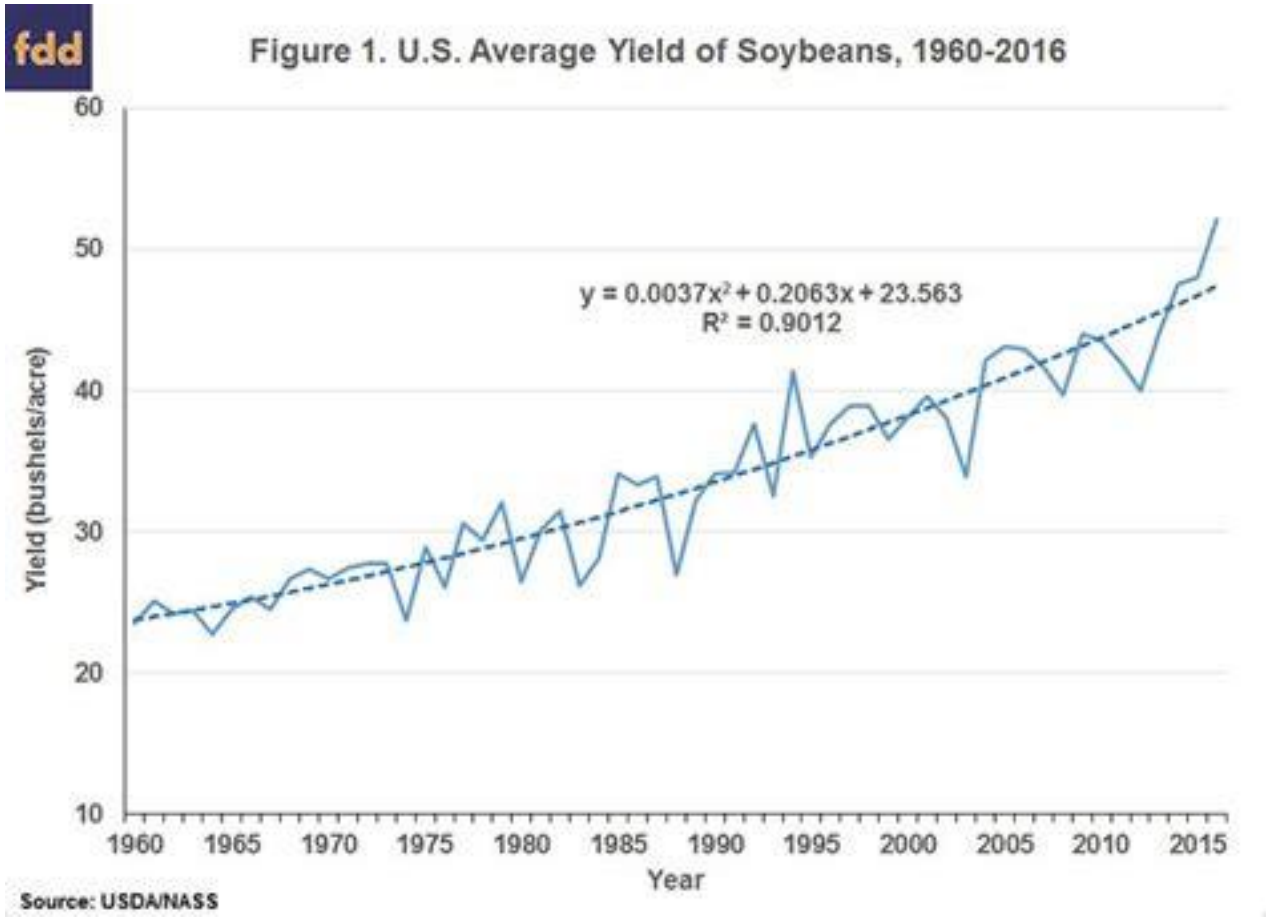
Arkansas State University
Graduated 2002
B.S. Botany



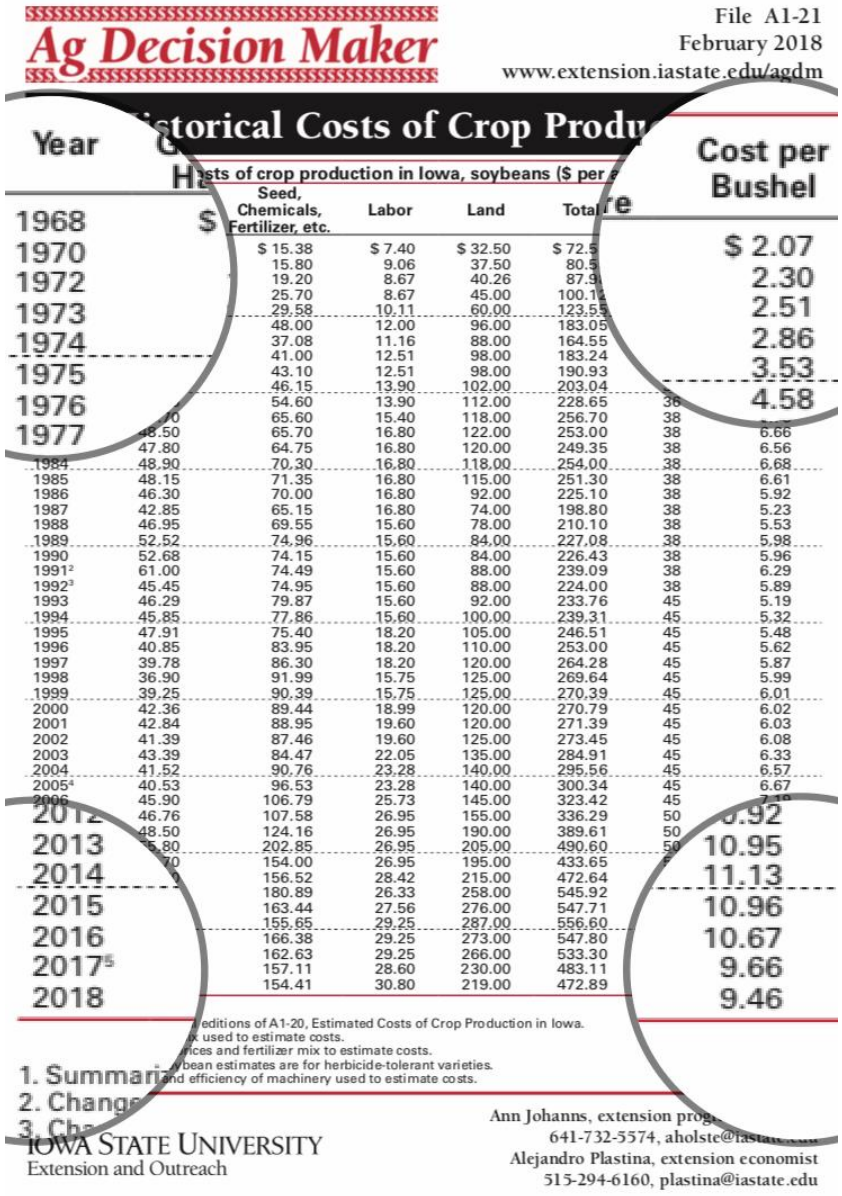
University of Arkansas
Graduated 2005
M.S. Entomology


Monthly Nearby Soybeans(CBOT)
Soybean Prices
1973
1977
1980
1983
1988
1996
2003
2008
2012
Today
Stats
Jul 2018
O 860.00
H 877.25
L 814.00
C 814.00
Chart
H 1794.75
L 331.13
1800.00
1600.00
1400.00
1200.00
1000.00
800.00
600.00
400.00
200.00
7374757677787980818283848586878889909192939495969798990001020304050607080910111213141516 17


Philip Shaw @Agridome · 7/16/18
Soybean Prices 1973-Today



Roughly a 100% increase in yields from early 1970's to today.



Ag Decision Maker

File A1-21
February 2018
www.extension.iastate.edu/agdm

Historical Costs of Crop Produ

Costs of crop production in Iowa, soybeans ($ per a

Year	Seed, Chemicals, Fertilizer, etc.	Labor	Land	Total	re	Cost per Bushel
1968	$					
1970	$ 15.38	$ 7.40	$ 32.50	$ 72.5		$ 2.07
1972	15.80	9.06	37.50	80.5		2.30
1973	19.20	8.67	40.26	87.9		2.51
1974	25.70	8.67	45.00	100.1		2.86
1975	29.58	10.11	60.00	123.55		3.53
1976	48.00	12.00	96.00	183.05		4.58
1977	37.08	11.16	88.00	164.55		
	41.00	12.51	98.00	183.24		
	43.10	12.51	98.00	190.93		
	46.15	13.90	102.00	203.04		
	54.60	13.90	112.00	228.65	36	
	65.60	15.40	118.00	256.70	38	
	65.70	16.80	122.00	253.00	38	6.66
	64.75	16.80	120.00	249.35	38	6.56
1984	70.30	16.80	118.00	254.00	38	6.68
1985	71.35	16.80	115.00	251.30	38	6.61
1986	70.00	16.80	92.00	225.10	38	5.92
1987	65.15	16.80	74.00	198.80	38	5.23
1988	69.55	15.60	78.00	210.10	38	5.53
1989	74.96	15.60	84.00	227.08	38	5.98
1990	74.15	15.60	84.00	226.43	38	5.96
1991[2]	74.49	15.60	88.00	239.09	38	6.29
1992[3]	74.95	15.60	88.00	224.00	38	5.89
1993	79.87	15.60	92.00	233.76	45	5.19
1994	77.86	15.60	100.00	239.31	45	5.32
1995	75.40	18.20	105.00	246.51	45	5.48
1996	83.95	18.20	110.00	253.00	45	5.62
1997	86.30	18.20	120.00	264.28	45	5.87
1998	91.99	15.75	125.00	269.64	45	5.99
1999	90.39	15.75	125.00	270.39	45	6.01
2000	89.44	18.99	120.00	270.79	45	6.02
2001	88.95	19.60	120.00	271.39	45	6.03
2002	87.46	19.60	125.00	273.45	45	6.08
2003	84.47	22.05	135.00	284.91	45	6.33
2004	90.76	23.28	140.00	295.56	45	6.57
2005[4]	96.53	23.28	140.00	300.34	45	6.67
2006	106.79	25.73	145.00	323.42	45	
2012	107.58	26.95	155.00	336.29	50	6.92
2013	124.16	26.95	190.00	389.61	50	10.95
2014	202.85	26.95	205.00	490.60	50	11.13
2015	154.00	26.95	195.00	433.65		10.96
2016	156.52	28.42	215.00	472.64		10.67
2017[5]	180.89	26.33	258.00	545.92		9.66
2018	163.44	27.56	276.00	547.71		9.46
	155.65	29.25	287.00	556.60		
	166.38	29.25	273.00	547.80		
	162.63	29.25	266.00	533.30		
	157.11	28.60	230.00	483.11		
	154.41	30.80	219.00	472.89		

editions of A1-20, Estimated Costs of Crop Production in Iowa.
x used to estimate costs.
ices and fertilizer mix to estimate costs.
bean estimates are for herbicide-tolerant varieties.
nd efficiency of machinery used to estimate costs.

1. Summari
2. Change
3. Cha

IOWA STATE UNIVERSITY
Extension and Outreach

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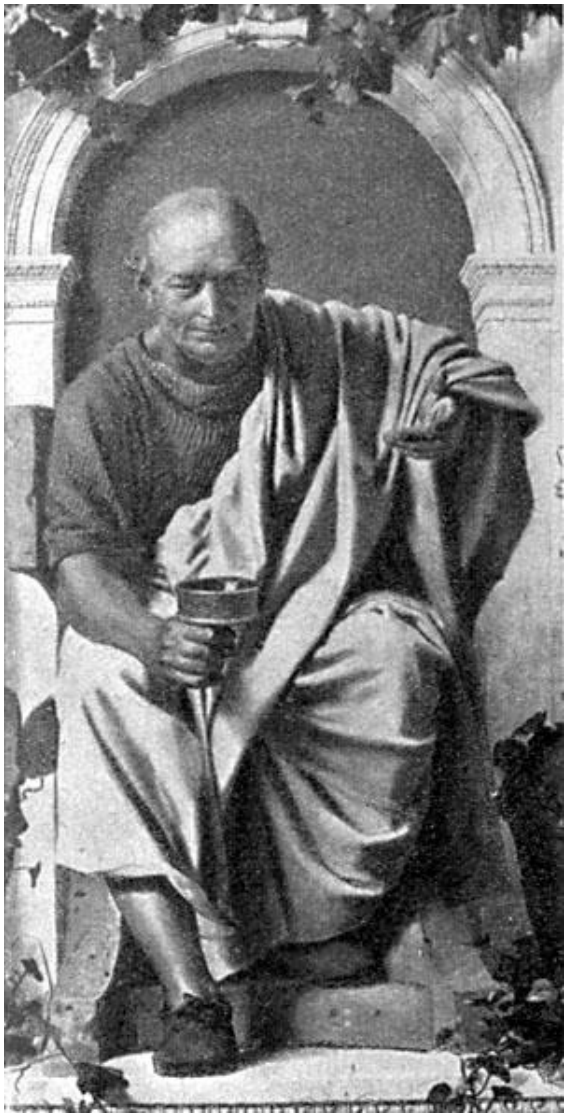
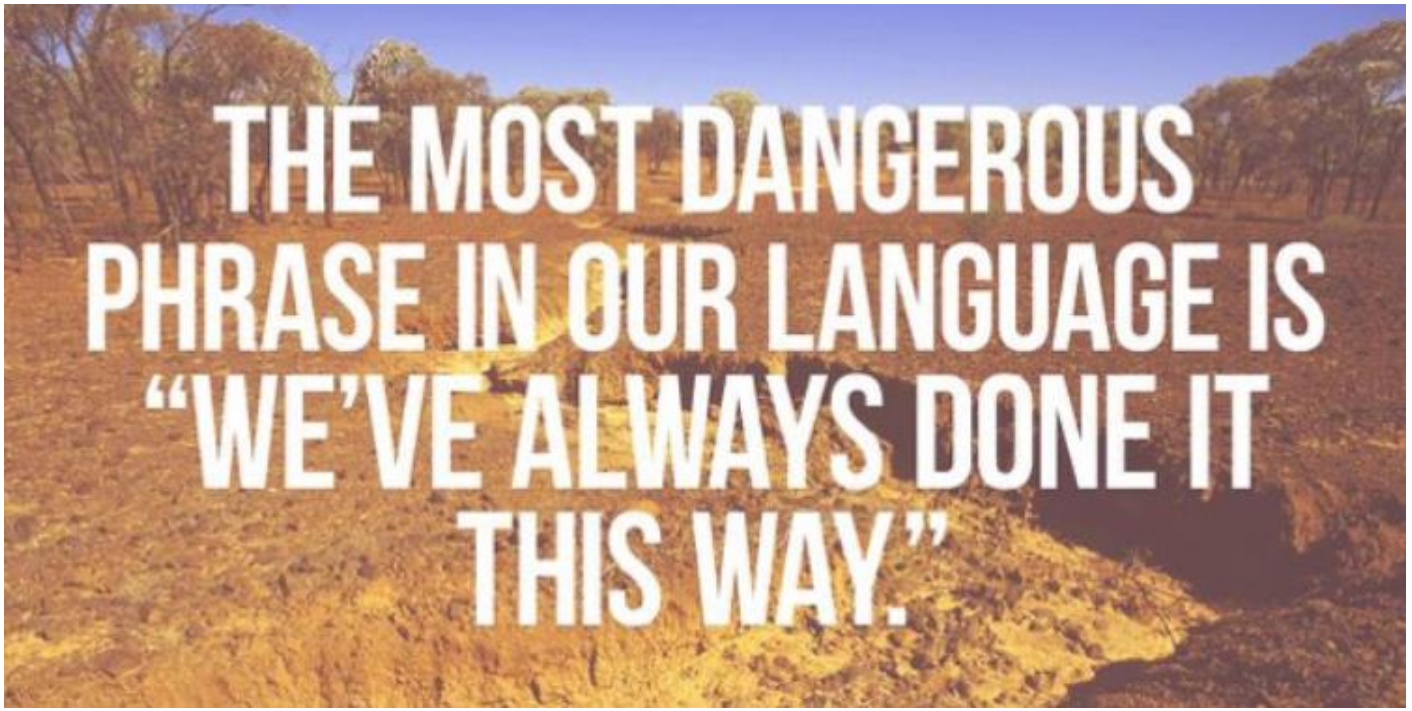
400% increase from early 1970's to today!!!



Adversity has the effect of eliciting talents which, in prosperous time would have lain dormant.

~Horace~


THE MOST DANGEROUS
PHRASE IN OUR LANGUAGE IS
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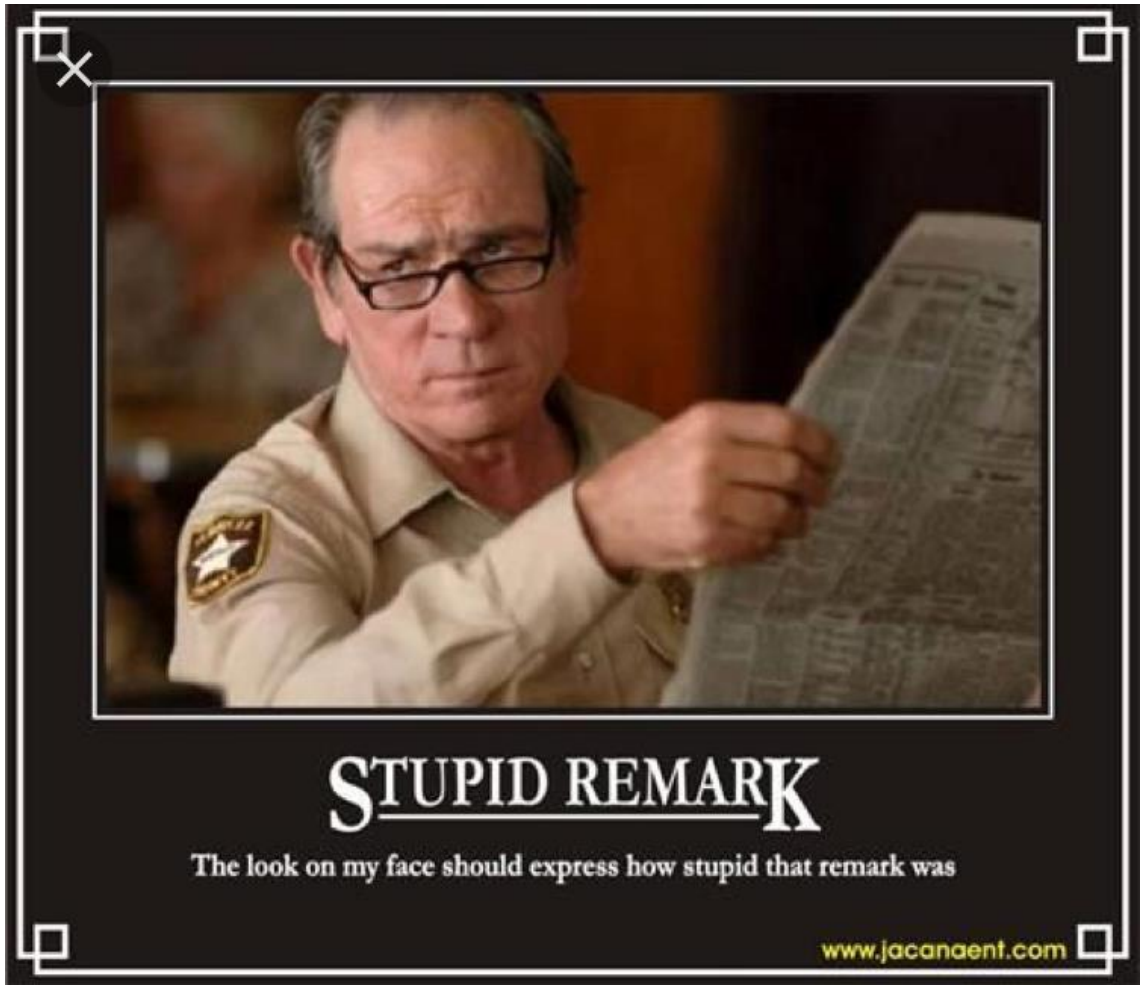
THIS WAY."


STUPID REMARK
The look on my face should express how stupid that remark was
www.jacanaent.com

Value added through No-Till and Cover Crops

- Less Irrigation Required
  - Better moisture retention
  - Better water infiltration (less ponding)
    - Less runoff/erosion
- Weed Control
- Better stands and planting conditions
- Nitrogen contributions and nutrient cycling-(ability to reduce fertility inputs)
- Value added through livestock

Tillage as a Last Resort!

- Less Fuel
- Less hours on Machines
- Less Repairs
- Farm more acres with less equipment and employees

No Tillage Ever!

Old System

- Pull Beds in Fall
- Freshen up beds twice in spring
- Pull Bed Conditioner
- All of this was complimented with a vast array of herbicide applications

New System

- Plant
- Spray
- Pull Small Furrow
- Herbicide program a Fraction of what it once was

Tillage Cost

- Disk or Turbo Till $12/A
- Field Cultivator $8/A
- Harrow $6/A
- Land Plane/Float $10
- V-Ripper $17/A
- Chisel Plow $15/A
- Hipper or Hipper-Roller $7/A
- **TOTAL $ 75/A**

- Disk 2 times $24
- V-Ripper 1 time $17/A
- Harrow 1 time $6
- Land Plane/Float 2 times $20
- Hipper/Roller 1 time fall $7
- Hipper/Roller 1 time Spring $7
- **TOTAL $81/A**

Slide credit: Robby Bevis Lonoke, AR.

Weed Control

- Less Weed Pressure
  - Out competes weeds early
  - Shades ground to prevent weed emergence
  - Good SUPPLEMENT to weed control program
  - Goal is to eliminate herbicides

Less Weed Pressure

Black Oats, C. Rye, Crimson Clover
NO WEEDS

No Cover
PLENTY OF WEEDS

Less Weed Pressure

Pre: 1qt Roundup+ 3 oz. Fierce

Burndown: 1qt Roundup +1qt 2,4-D + 10oz dicamba

Pre: 1qt Gramoxone + 3 oz. Fierce

Post: 1qt Liberty + 1qt Prefix

2nd Post: 1qt Liberty +1.33pt Dual

90% of planted acres are NON GMO crops

Table 34. 2018 Cotton Enterprise Budget, GLT/WRF, Furrow Irrigation					
CROP VALUE	**Grower %**	**Unit**	**1Yield**	**Price/Unit**	**Revenue**
Crop Value, Enter Expected Farm Yield & Price	100%	Lbs	1,200.00	0.65	780.00
Cottonseed Value	100%	Ton	0.90	199.53	179.58
OPERATING EXPENSES		**Unit**	**Quantity**	**2Price/Unit**	**Costs**
Seed, Includes Applicable Fees;	100%	Acre	1.0	128.72	128.72
Nitrogen 100%	100%	Lbs	93.59	0.366	34.28
Phosphate (P2O5) 100%	100%	Lbs	30.00	0.408	12.23
Potash (K2O) 100%	100%	Lbs	60.00	0.262	15.75
Sulfur 100%	100%	Lbs	10.00	0.356	3.56
Boron 100%	100%	Lbs	1.00	6.667	6.67
Other Nutrients, Including Poultry Litter	100%	Acre	1	0.00	0.00
Herbicide	100%	Acre	1	98.68	98.68
Insecticide	100%	Acre	1	97.74	97.74
Nematicide	100%	Acre	1	0.00	0.00
Growth Regulator	100%	Acre	1	2.41	2.41
Defoliant	100%	Acre	1	16.75	16.75
Custom Chemical & Fertilizer Applications					
Ground Application: Fertilizer & Chemical	100%	Acre	0	7.00	0.00
Air Application: Fertilizer & Chemical	100%	Acre	2	7.00	14.00
Air Application: Lbs.	100%	Lbs	0	0.070	0.00
Other Custom Hire, Air Seeding	100%	Acre	0	7.00	0.00
Machinery and Equipment					
Diesel Fuel, Pre-Post Harvest	100%	Gallons	6.130	2.20	13.49
Repairs and Maintenance, Pre-Post Harvest	100%	Acre	1	12.55	12.55
Diesel Fuel, Harvest	100%	Gallons	5.810	2.20	12.78
Repairs and Maintenance, Harvest	100%	Acre	1	18.30	18.30
Irrigation Energy Cost	100%	Ac-In	12	2.60	31.18
Irrigation System Repairs & Maintenance		Ac-In	12	0.24	2.88
Supplies (ex. polypipe)	100%	Acre	1	3.88	3.88
Other Inputs	100%	Acre	1	0.00	0.00
Labor, Field Activities	100%	Hrs	1.854	13.45	24.94
Scouting/Consultant Fee	100%	Acre	1	10.00	10.00
Boll Weevil Eradication Fee; See Note 3	100%	Acre	1	3.00	3.00
Crop Insurance	100%	Acre	1	8.41	8.41
Interest, Annual Rate Applied for 6 Months	100%	Rate %	4.30	572.20	12.30
Custom Harvest	100%	Acre	0.00	0.00	0.00
Post-Harvest Expenses; See Note 4					
Hauling, Ginning	100%	Lbs	1200.00	0.10	120.00
Storage and Warehousing	100%	Bale	2.40	20.00	48.00
Promotions, Boards, Classing	100%	Bale	2.40	4.8250	11.58
Cash Land Rent		Acre	1	0.00	0.00
Total Operating Expenses					**$584.51**
Returns to Operating Expenses					**$195.49**
CAPITAL RECOVERY & FIXED COSTS					
Machinery and Equipment		Acre	1	152.78	152.78
Irrigation Equipment		Acre	1	17.81	17.81
Farm Overhead; See Note 5		Acre	1	7.64	7.64
Total Capital Recovery & Fixed Costs					**$178.23**
TOTAL SPECIFIED EXPENSES					**$762.73**
NET RETURNS					**$17.27**

Note 1: Yield and inputs are based on Extension research data. Enter expected farm yield and inputs.
Note 2: All price estimates do NOT include rebates, bulk deals, or discounts available through suppliers.
Note 3: Boll weevil eradication fee is $3 in Arkansas.
Note 4: Cottonseed value deducted from post-harvest expenses for calculating operating expenses.
Note 5: Estimate based on machinery and equipment.

Table 37. 2018 Cotton Enterprise Budget, Conventional, Furrow Irrigation					
CROP VALUE	**Grower %**	**Unit**	**1Yield**	**Price/Unit**	**Revenue**
Crop Value, Enter Expected Farm Yield & Price	100%	Lbs	1,200.00	0.65	780.00
Cottonseed Value	100%	Ton	0.90	199.53	179.58
OPERATING EXPENSES		**Unit**	**Quantity**	**2Price/Unit**	**Costs**
Seed, Includes Applicable Fees;	100%	Acre	1.0	27.55	27.55
Nitrogen 100%	100%	Lbs	93.59	0.366	34.28
Phosphate (P2O5) 100%	100%	Lbs	30.00	0.408	12.23
Potash (K2O) 100%	100%	Lbs	60.00	0.262	15.75
Sulfur 100%	100%	Lbs	10.00	0.356	3.56
Boron 100%	100%	Lbs	1.00	6.667	6.67
Other Nutrients, Including Poultry Litter	100%	Acre	1	0.00	0.00
Herbicide	100%	Acre	1	88.70	88.70
Insecticide	100%	Acre	1	106.11	106.11
Nematicide	100%	Acre	1	0.00	0.00
Growth Regulator	100%	Acre	1	2.41	2.41
Defoliant	100%	Acre	1	16.75	16.75
Custom Chemical & Fertilizer Applications					
Ground Application: Fertilizer & Chemical	100%	Acre	0	7.00	0.00
Air Application: Fertilizer & Chemical	100%	Acre	2	7.00	14.00
Air Application: Lbs.	100%	Lbs	0	0.070	0.00
Other Custom Hire, Air Seeding	100%	Acre	0	7.00	0.00
Machinery and Equipment					
Diesel Fuel, Pre-Post Harvest	100%	Gallons	6.130	2.20	13.49
Repairs and Maintenance, Pre-Post Harvest	100%	Acre	1	12.55	12.55
Diesel Fuel, Harvest	100%	Gallons	5.810	2.20	12.78
Repairs and Maintenance, Harvest	100%	Acre	1	18.30	18.30
Irrigation Energy Cost	100%	Ac-In	12	2.60	31.18
Irrigation System Repairs & Maintenance		Ac-In	12	0.24	2.88
Supplies (ex. polypipe)	100%	Acre	1	3.88	3.88
Other Inputs	100%	Acre	1	0.00	0.00
Labor, Field Activities	100%	Hrs	1.854	13.45	24.94
Scouting/Consultant Fee	100%	Acre	1	10.00	10.00
Boll Weevil Eradication Fee; See Note 3	100%	Acre	1	3.00	3.00
Crop Insurance	100%	Acre	1	8.41	8.41
Interest, Annual Rate Applied for 6 Months	100%	Rate %	4.30	469.41	10.09
Custom Harvest	100%	Acre	0.00	0.00	0.00
Post-Harvest Expenses; See Note 4					
Hauling, Ginning	100%	Lbs	1200.00	0.10	120.00
Storage and Warehousing	100%	Bale	2.40	20.00	48.00
Promotions, Boards, Classing	100%	Bale	2.40	4.8250	11.58
Cash Land Rent		Acre	1	0.00	0.00
Total Operating Expenses					**$479.50**
Returns to Operating Expenses					**$300.50**
CAPITAL RECOVERY & FIXED COSTS					
Machinery and Equipment		Acre	1	152.78	152.78
Irrigation Equipment		Acre	1	17.81	17.81
Farm Overhead; See Note 5		Acre	1	7.64	7.64
Total Capital Recovery & Fixed Costs					**$178.23**
TOTAL SPECIFIED EXPENSES					**$657.73**
NET RETURNS					**$122.27**

Note 1: Yield and inputs are based on Extension research data. Enter expected farm yield and inputs.
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Note 3: Boll weevil eradication fee is $3 in Arkansas.
Note 4: Cottonseed value deducted from post-harvest expenses for calculating operating expenses.
Note 5: Estimate based on machinery and equipment.

GMO

Total Operating Expenses					**$584.51**
Returns to Operating Expenses					**$195.49**
CAPITAL RECOVERY & FIXED COSTS					
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Total Capital Recovery & Fixed Costs					**$178.23**
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NET RETURNS					**$17.27**

Non GMO

Total Operating Expenses					**$479.50**
Returns to Operating Expenses					**$300.50**
CAPITAL RECOVERY & FIXED COSTS					
Machinery and Equipment		Acre	1	152.78	152.78
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Can you get a Stand?

Can We Get A Stand?

Not comfortable with Non GMO 60” or 76” cotton rows to save on seed cost

What crops can we use covers on? How does it affect rotations?

Moisture Retention

- Pictures taken Nov 10th. Last rain event @2" Early Sept.
- Temps have averaged in the 80's and 90's
- This allows us to delay the initiation of irrigation and reduce the number of irrigation events in crop

Erosion Control and Increased Infiltration

Pic credit Robby Bevis

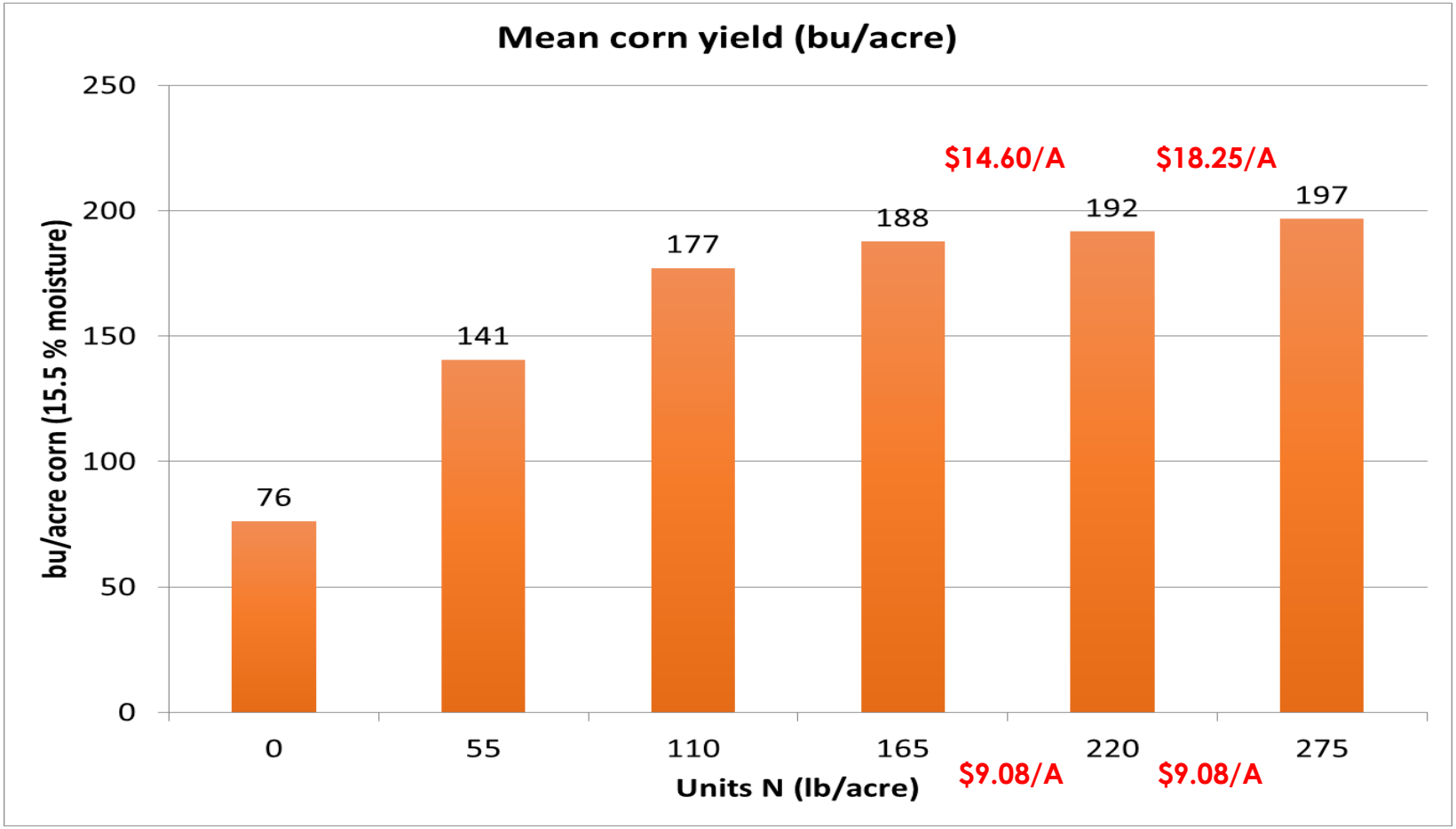
Infiltration Rate of 0.5-1 inches per hour

Infiltration Rate of 6-8 inches per hour

Reducing Evaporation Losses

This system has reduced our irrigation frequency by 50%

Nutrient Cycling



Urea=$330/ton Corn=$3.65/bu

What about hidden costs such as application, labor, fuel?

	NITROGEN RATE		
Year	185#	100#	50#
1983	115	113	114
1985	135	132	136
1988	141	141	139
1991 *	148	132	130
1994	151	152	151
1995	125	115	100
1996	155	158	157
2000	160	151	153
2002	163	160	159
2004	175	178	177
2005	168	170	172
2006	164	163	165
2007	214	210	219
2008	146	170	174

Represen
no cover
nitrogen r

*Data Courtesy of David Brandt of Walnut Creek Seeds Carroll, OH

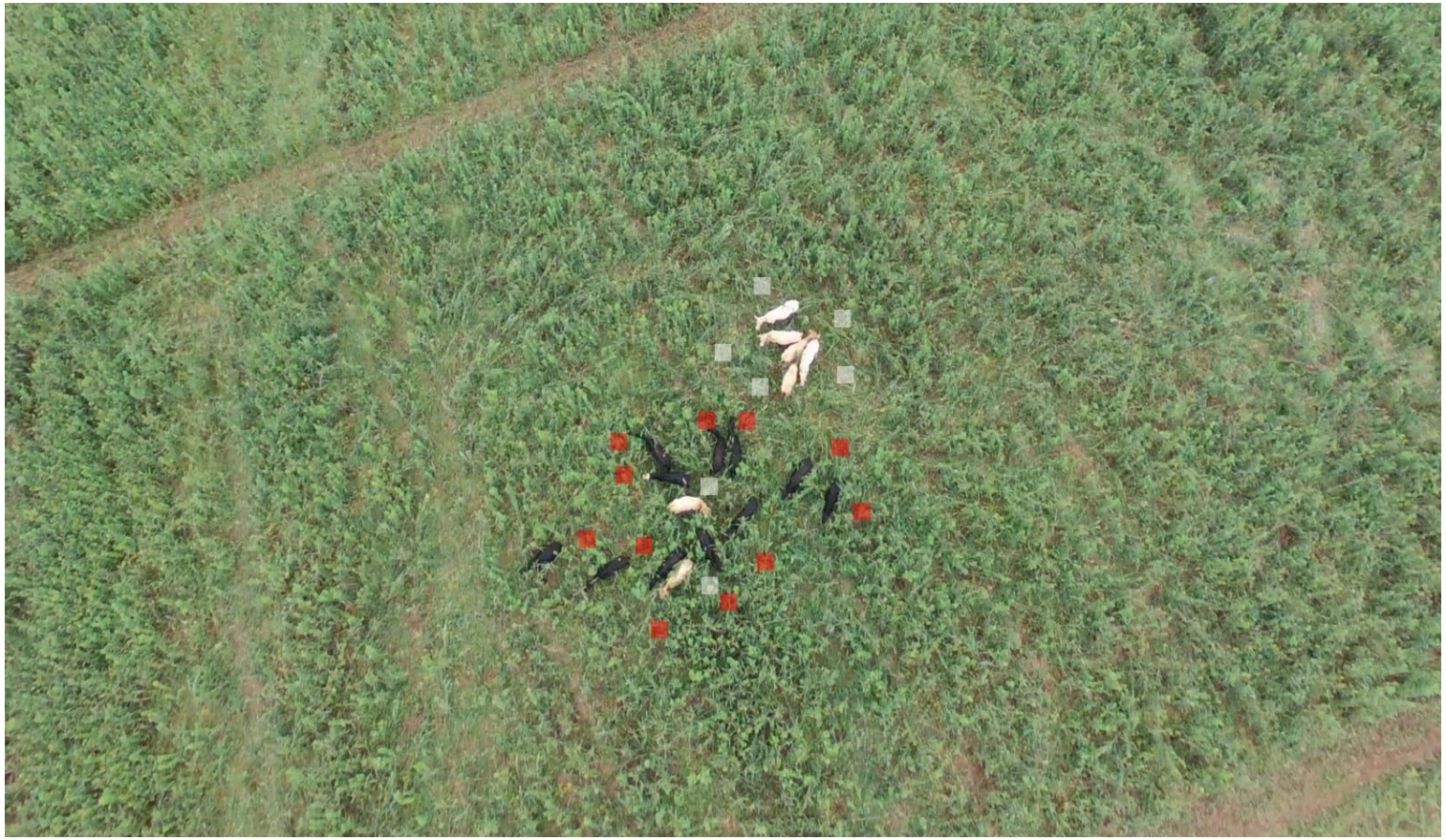
Where do cows fit in?

- Dryland scenarios are perfect
- Buy cows if the price is right
- What do they bring in terms of value?
  - Income
  - Manure/urine/saliva
  - fun

Concerns/Infrastructure

- Fencing
- Water
- Minerals
- Working Facilities
- Insurance
- Margins
- Management

Cattle



Fencing

Water/Minerals

There are many benefits to using cover crops, several of which can provide substantial savings to your operation. It does take a adjustment of mindset to fully adopt these changes, but the benefits far out weigh the challenges.

Thanks for the invite!

If I can answer any questions about what we are doing on our farm or help you try and adapt it to yours please give me a call or send an email

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- @cottonplantkid
- Chappell.adam@gmail.com
- 870-219-6228