

Harnessing data to make more profitable decisions

February 5, 2019 | Illinois Soybean Summit

Landon Frye | Director, Granular & AcreValue



What is AgTech?

Mechanization

Hybrid crops

Green Revolution – Fertilizers, Pesticides

GMOs

Precision farming

What is AgTech?

Automation of equipment and robotics

CRISPR synthetic biotechnology

Food tech – Impossible burger and fake meat

Sensors, Artificial Intelligence, and machine learning

Software and Analytics – Digital Ag

New digital marketplaces

1 / What is Digital Ag?

2 / Farms Today

3 / How does it add value?

4 / Granular Overview

Digitization

- Business processes
- Market making
- Digitization of work
- Labor records
- Digital spending
- Digital assets
- Transactions
- Interactions

Sector	Over-all digitization ¹	Assets		Usage			Labor			GDP share %	Employment share %	Productivity growth, 2005–14 ² %
		Digital spending	Digital asset stock	Transactions	Interactions	Business processes	Market making	Digital spending on workers	Digital capital deepening			
ICT										5	3	4.6
Media		1								2	1	3.6
Professional services										9	6	0.3
Finance and insurance										8	4	1.6
Wholesale trade					4					5	4	0.2
Advanced manufacturing										3	2	2.6
Oil and gas		2								2	0.1	2.9
Utilities										2	0.4	1.3
Chemicals and pharmaceuticals										2	1	1.8
Basic goods manufacturing										5	5	1.2
Mining										1	0.4	0.5
Real estate	●									5	1	2.3
Transportation and warehousing	●									3	3	1.4
Education	●				3				5	2	2	-0.5
Retail trade	●									5	11	-1.1
Entertainment and recreation										1	1	0.9
Personal and local services										6	11	0.5
Government	●									16	15	0.2
Health care										10	13	-0.1
Hospitality	●	6								4	8	-0.9
Construction										3	5	-1.4
Agriculture and hunting										1	1	-0.9

...but New Tech Is Creating Opportunities for Innovation

Mobile Computing



Off-grid Energy



Computation & Machine Learning



Satellite & Imagery



Data Sensor Input



Wireless Communications



Drones



Robotics & Automation



Genetics & Synthetic Bio



Source: AgFunder.

Shifts in Supply and Demand Driving Change Faster than Before

Supply



Smart agriculture

Developed market – least digitized industry

Emerging market – no digital

Demand



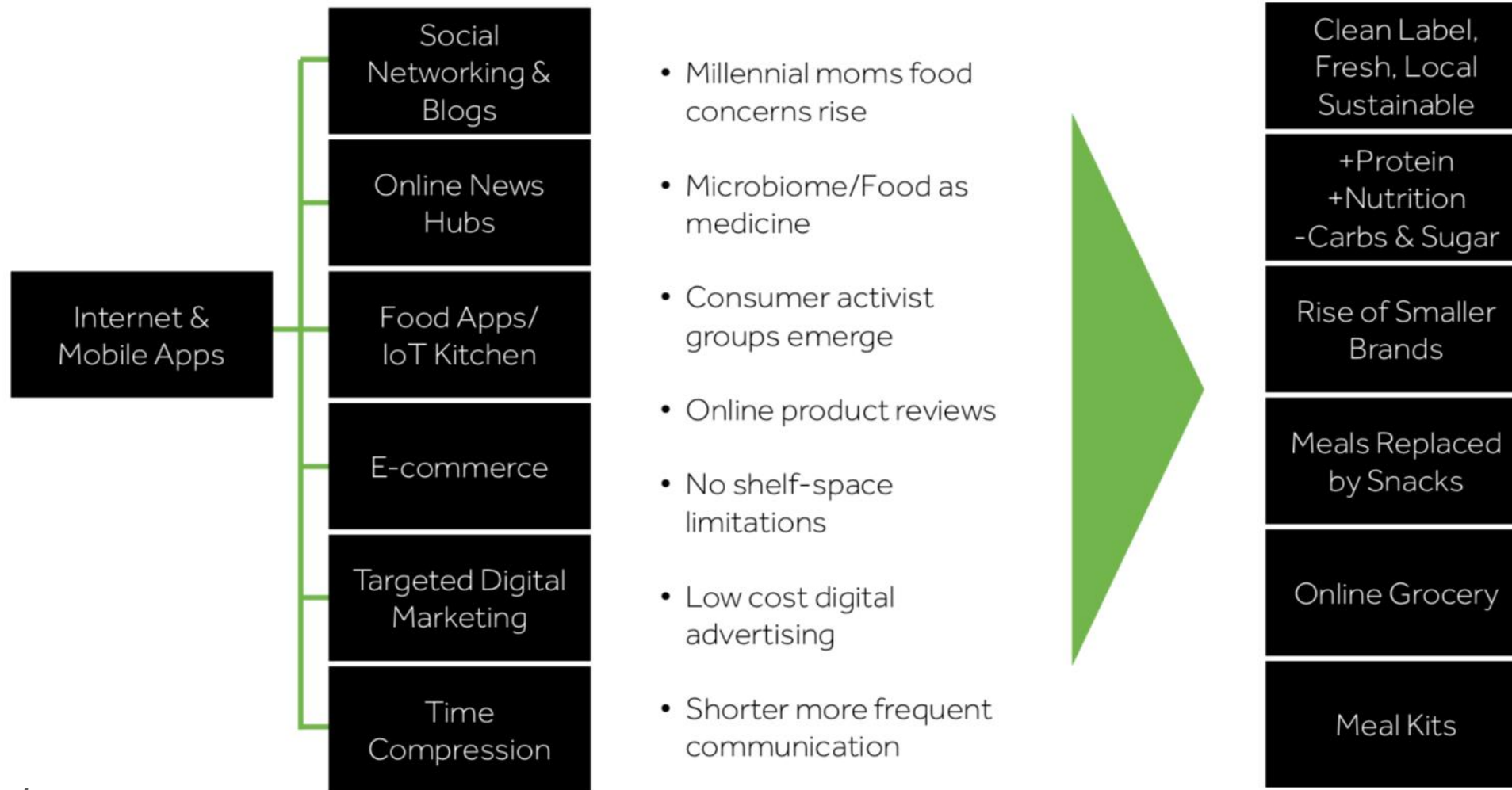
Consumer trends

Developed market – healthy, sustainable, fresh

Emerging market – protein & calories

Source: AgFunder.

Social Media Transforming Opinions on Food...

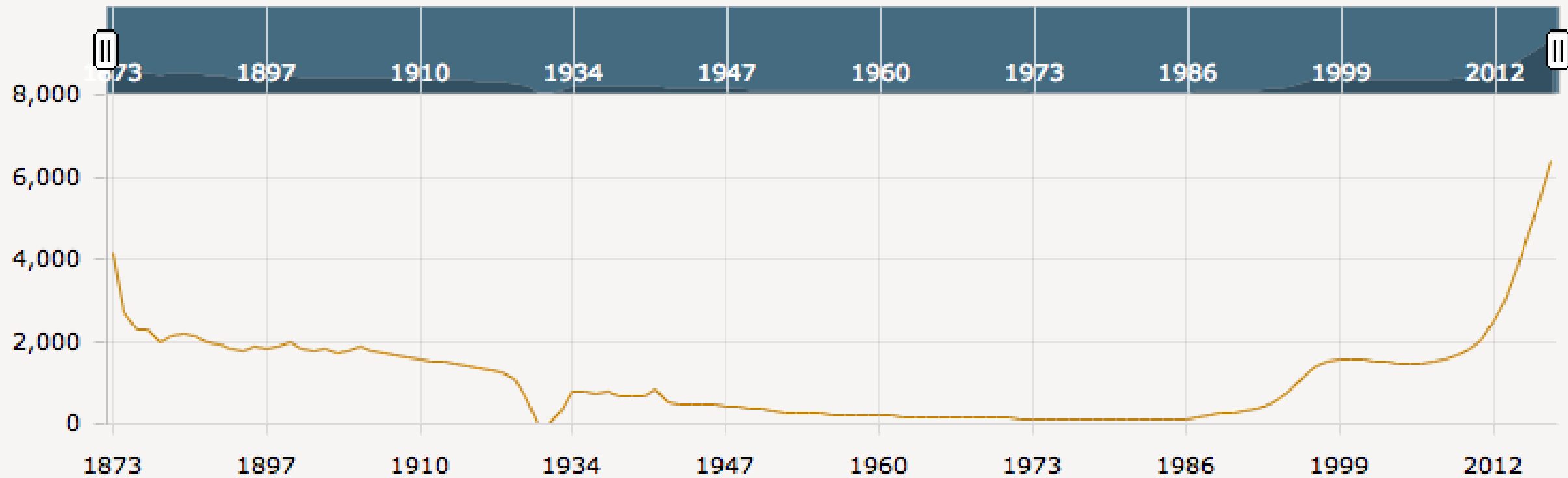


Source: AgFunder.

NUMBER OF BREWERIES

Historical U.S. Brewery Count

Slide the bar at the top of the graph to see number of breweries from 1873 to present day.



...and Our Competition is Heating Up

 REUTERS

China to invest \$450 billion modernizing agriculture by 2020

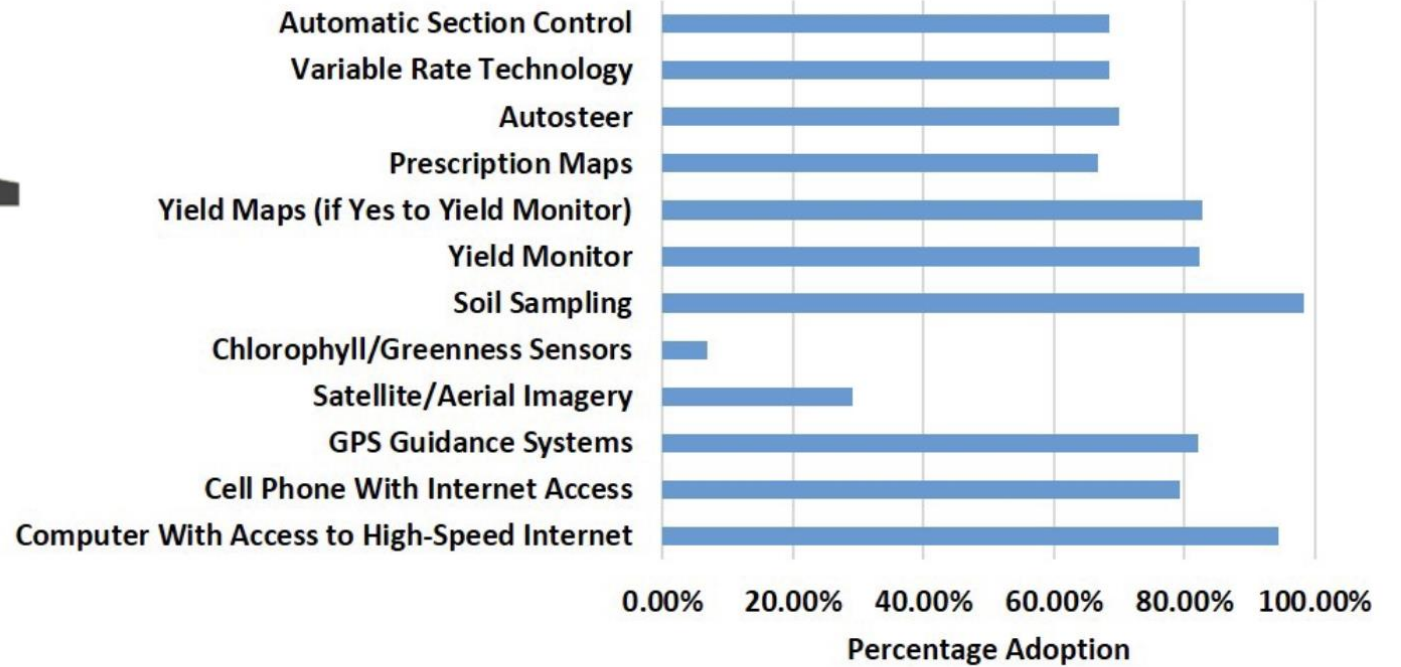
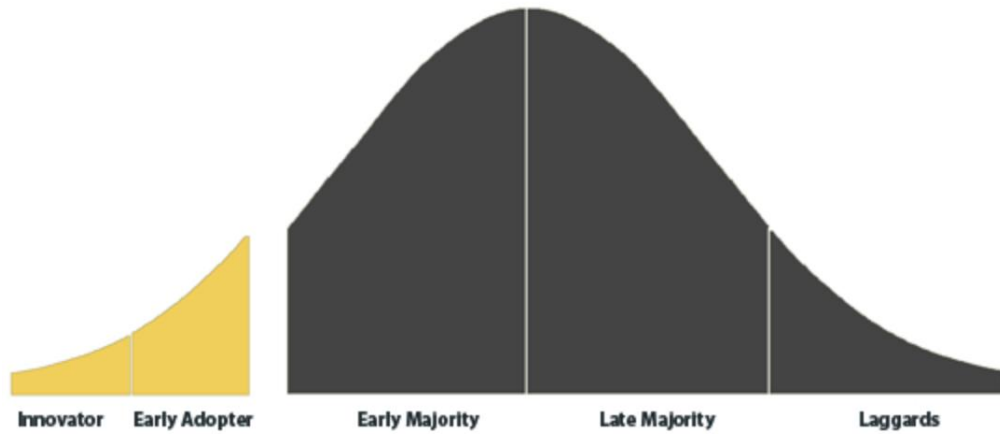
BUSINESS NEWS | Sun Sep 18, 2016 | 11:14am EDT

China to invest \$450 billion modernizing agriculture by 2020



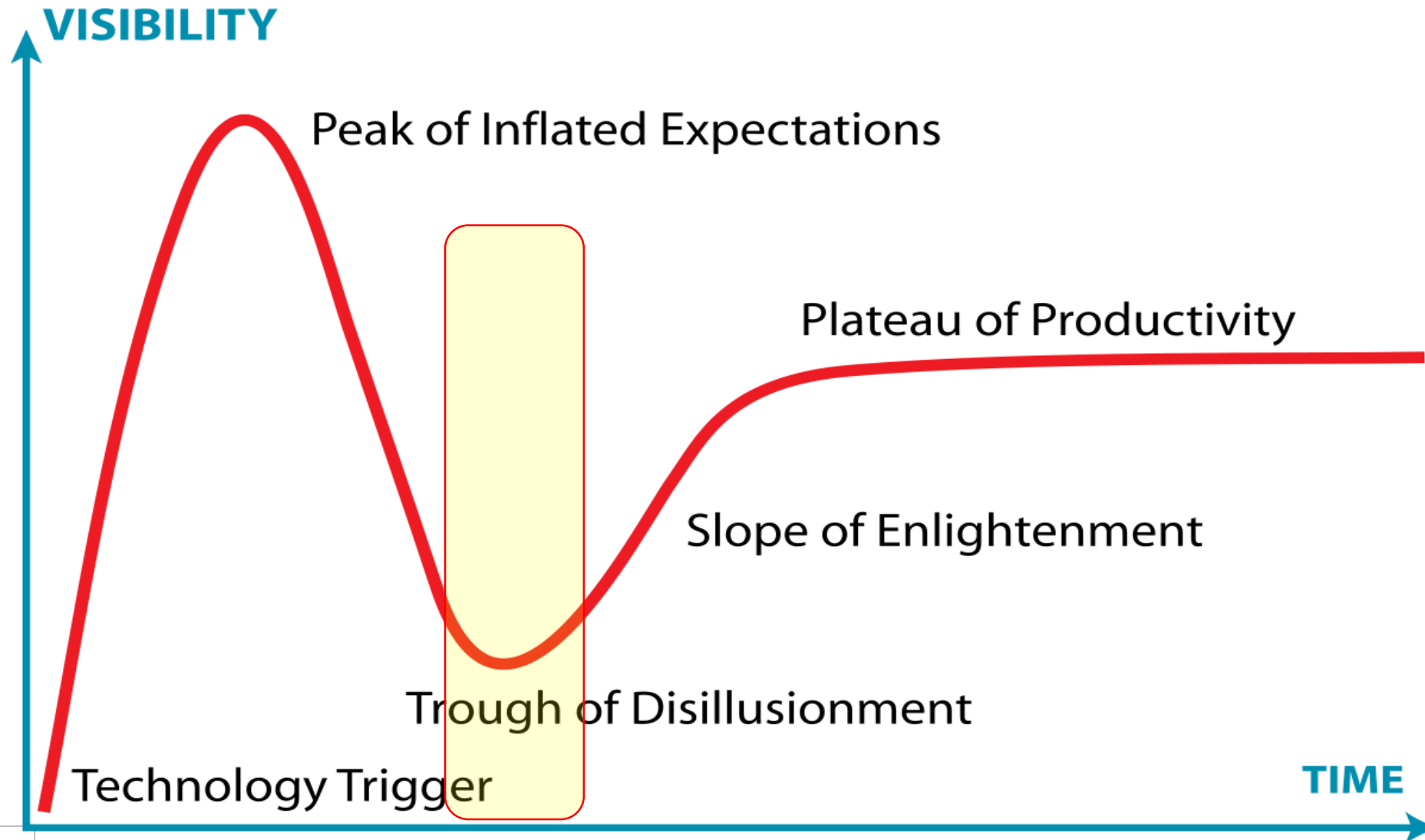
People work in the field in Yili, Xinjiang Uyghur Autonomous Region, China, September 4, 2016. China Daily/via REUTERS

It's Not Just the Early Adopters Anymore



Precision agriculture technology usage, **Source:** University of Nebraska-Lincoln

The ag software and analytics “Hype Cycle”



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Do Any of These Ring True?



How can I **save more time?**



How can I track my inventory in **real time?**

\$220/ac?

\$200/ac?

\$250/ac?

What is my **cost of production**, down to the field?

Op Name	Unit	Repair Category	Unit
16 8 Spray	Custom		3.54 6.61 6.02 1.48 8.42 4.4
16 7 Combine Dryland Corn			
17 8 Cart			
18 9 Trunk			
19 10 Dry Grain			
20 11			
21 12			
22 13			
23 14			
24 15			
25 16			
26 17			
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100 91			

Can I get **more value** out of all this data?

Most farms today run on spreadsheets – a lot of spreadsheets (or yellow pads, 3-ring binders)

AGRONOMIC

- Yields by field
- Input inventories
- Crop inventories
- Hauling data

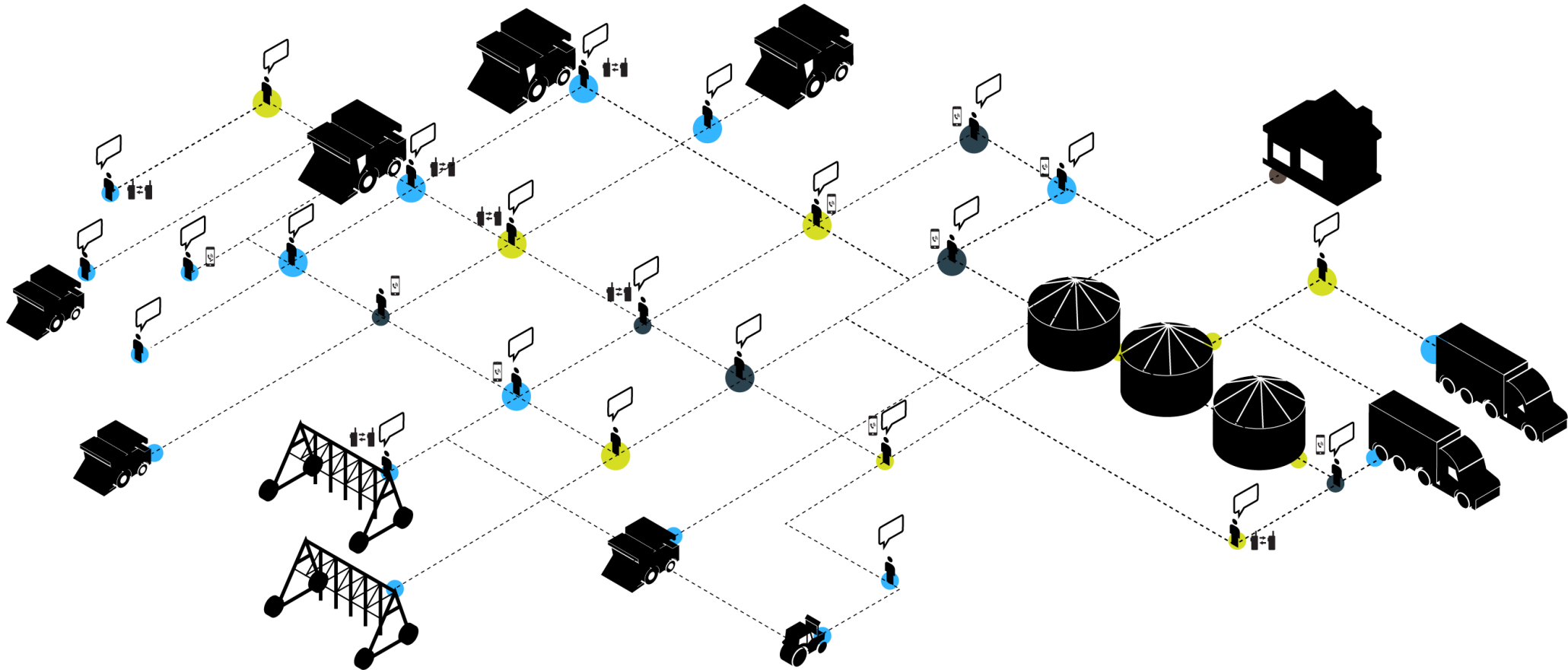
FINANCIAL

- Budgets and actuals
- Income statement
- Balance sheet
- Cash flow statements

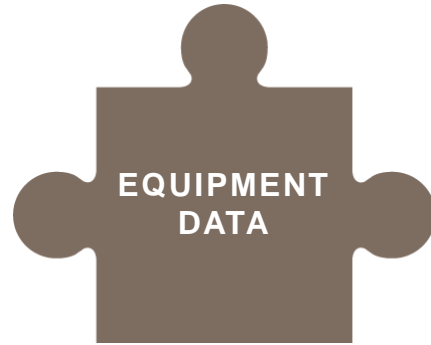
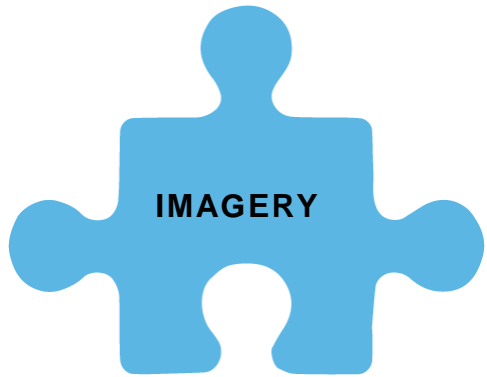
OPERATIONAL

- Machine data
- Work orders
- Employee productivity
- Crop share / rents agreements

Employees & equipment are managed remotely, via two-way radios, calls, texts, etc.

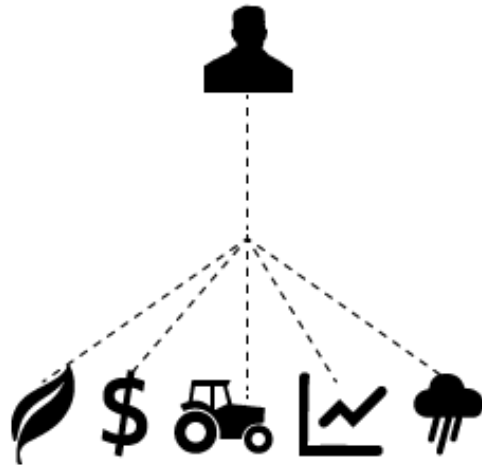


Other software tools on the farm tend to be disconnected...

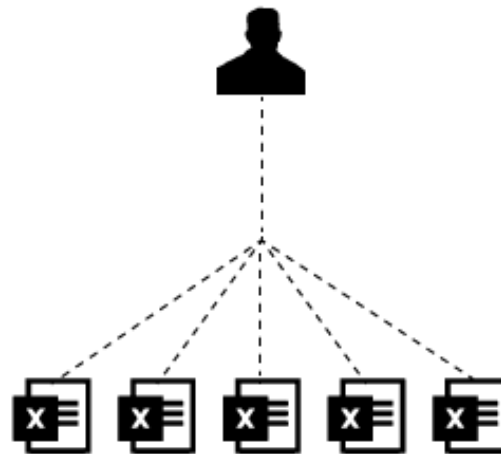


...which makes reporting challenging

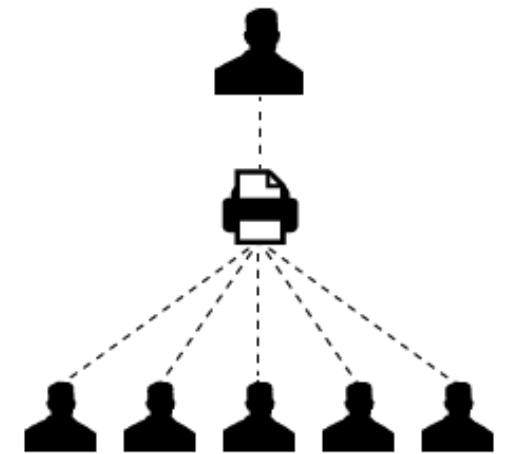
LOG INTO MULTIPLE SYSTEMS



UPDATE & CROSS REFERENCE SPREADSHEETS



PRINT & SHARE MANUALLY



...and is not sustainable as operations expand

TIME CONSUMING

INACCURATE

NOT REAL TIME

INSUFFICIENT ANALYTICS

LIMITED POTENTIAL FOR COLLABORATION & BENCHMARKING



ILLINOIS

BASICS

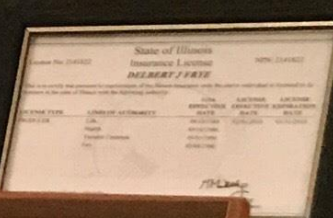
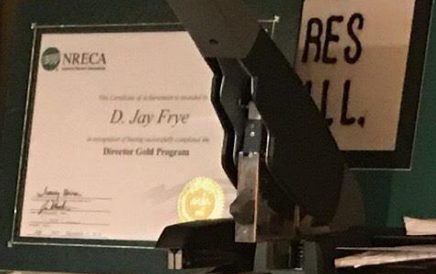
Handwritten notes on a sticky note.

SONY

HP

Calculator

Handwritten note on the floor.



D. JAY FRYE

A large set of tan metal filing cabinets with multiple drawers. The drawers are labeled with various names and terms:

- Top row: "Crop", "Tax", "Menard", [blank], [blank], "Expanding A-Z"
- Second row: [blank], "Tax", [blank], [blank], [blank], [blank]
- Third row: [blank], "Burrus", [blank], [blank], [blank], [blank]
- Bottom row: "FBFI", [blank], [blank], [blank], [blank], [blank]

verizon

Why don't most farms use business software already?

WHAT SOME PEOPLE THINK

- Farming is too unpredictable
- Intuition is more important than data
- Labor force is not tech savvy



THE REAL REASONS

- We haven't had cloud software until recently
- Data is only now beginning to flow among equipment, operators and office
- Traceability and regulatory demands have been limited

① Apple
② iCloud
③ Gmail LIVE
④ iPhoto
⑤ iMovie
⑥ iBooks
⑦ iWork
⑧ iLife
⑨ iPhoto
⑩ iMovie
⑪ iBooks
⑫ iWork
⑬ iLife
⑭ iPhoto
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2 / Farms today

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BRAD PITT



MONEYBALL

JONAH HILL PHILIP SEYMOUR HOFFMAN

BASED ON A TRUE STORY

**We are playing
Moneyball**





“I THINK THE QUESTION WE SHOULD BE ASKING IS, DO YOU BELIEVE IN THIS THING OR NOT?”

- Moneyball

The 5% Rule in Farm Profitability

Small actions can lead to large gains

Goal: Increase **yield** and **price** received by **5%** and decrease **expenses** by **5%**



THE 5% RULE		Before		Increase		After
Yield		210		5%		221
Price	\$	<u>3.76</u>		5%	\$	<u>3.95</u>
Revenue	\$	790			\$	871
Less: Expenses	\$	<u>420</u>		-5%	\$	<u>399</u>
Profit/Loss	\$	370			\$	472
				Increase in Profitability		\$102
				Increase in Profitability		28%

Digital ag and software designed to manage the business of farming help answer...

Do you know
what your
breakeven is?

Do you know
how much money
you can lose?

Do you know
your working
capital
requirements?

Most farms today run on spreadsheets – a lot of spreadsheets (or yellow pads, 3-ring binders)

AGRONOMIC

- Yields by field
- Input inventories
- Crop inventories
- Hauling data

OPERATIONAL

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FINANCIAL

- Budgets and actuals
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Ultimately, get to the most important questions

Agronomic

How do I maximize yield?

How much nitrogen should I put on my fields and when?

What is the best performing hybrid for my field?

When should I plant and harvest my crop?

Should I apply more herbicide to that field?

Operational

How big a fleet do I need to buy?

Do I need to hire another crop manager?

Can I get in that field today?

What is the most efficient order in which to conduct tasks on my farm?

What's the best route to drive on my fields?

Financial

What crop mix is most profitable?

How much should I charge for spraying my neighbor's field?

Can I afford to bid for land in the next county?

When, where and to whom should I sell?

Am I paying too much for chemicals?

What's the Value of Farm Management Software?



Efficiency

Get more done with less



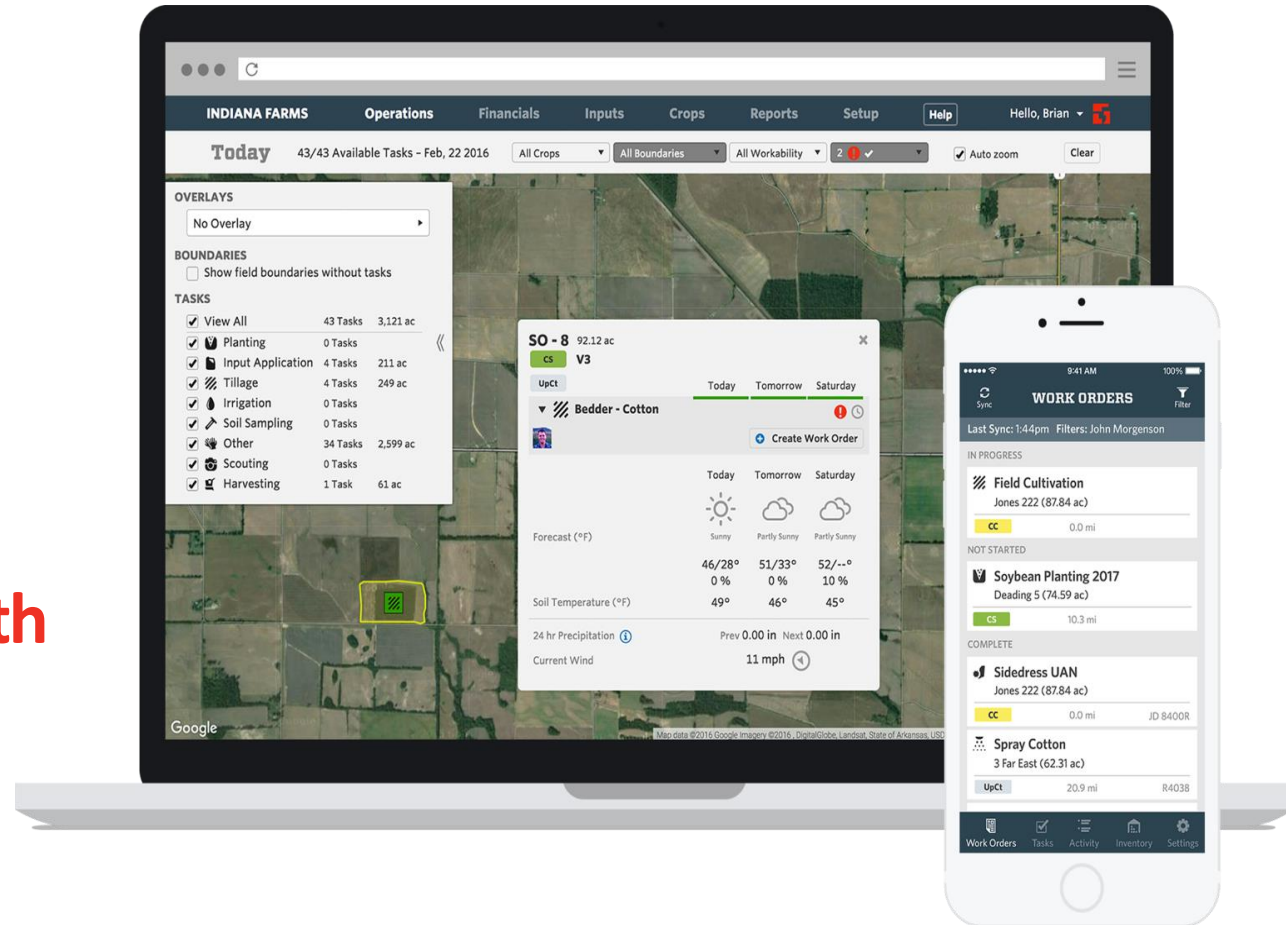
Profitability

Make better decisions



Succession & Growth

Build better networks & succession plans



Efficiency: Get More Done With Less

Easy
collaboration

Faster,
better decisions

Fewer mistakes

Manage from
anywhere

Being able to track activities on a mobile app gave us a chance to be more proactive with field team operations and management.

Better communication improved efficiency and saved us \$14k in labor costs”

Kasey Bryant, Bryant Ag, Ohio



Profitability: Make Better Decisions

Gauge
the impact

Profit margin

Plan ahead

Manage changes

Field level financials allowed us to see that our highest margin soybeans fields were those farthest from home, so we prioritized work to these fields, creating a \$25k net improvement in dollar yield”

Kip Tom, Tom Farms, Indiana



Succession & Growth: Build Better Networks & Plans

**Build
transparency**

**Benchmark
against the best**

Better partners

**Succession
planning**



1 / What is Digital Ag?

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Helps farms learn, change, and grow

Helps farms share, collaborate, and analyze

Helps farms manage the dollar yield in real-time

1 / What is Digital Ag?

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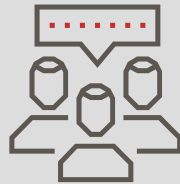
3 / How does it add value?

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Granular helps farms be more efficient and profitable



Makes it easy to get farm's critical financial and agronomic data in one organized place



Improves communications on the farm and with trusted suppliers



Helps farmers make better decisions with data science and benchmarking

Established.

Stable.

Growing.

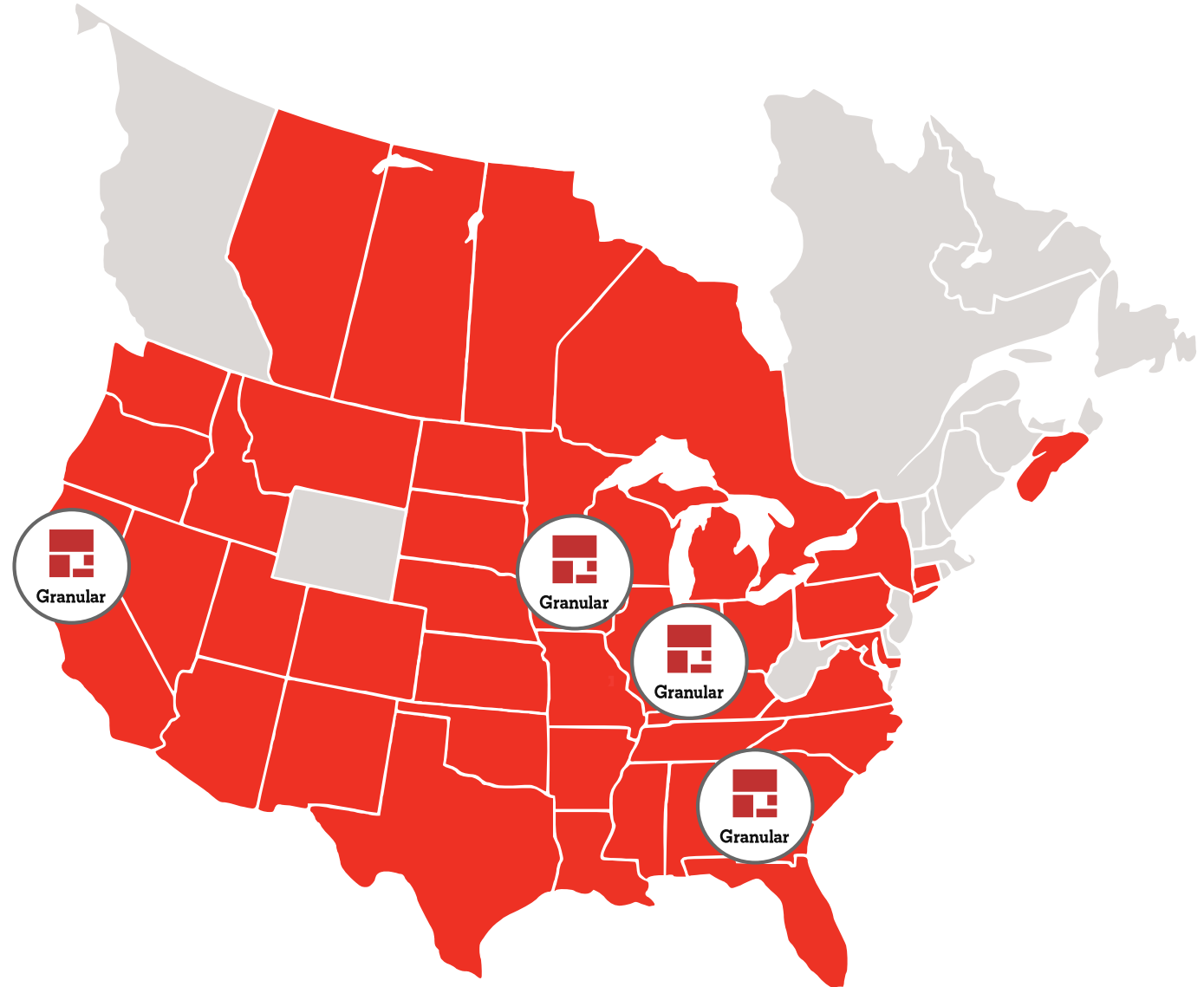
Granular Customers

40 US States, Canada, Australia

> 5M paid acres

88 crop types

Farms with 2-65 operators



The Only Software Suite That Does It All

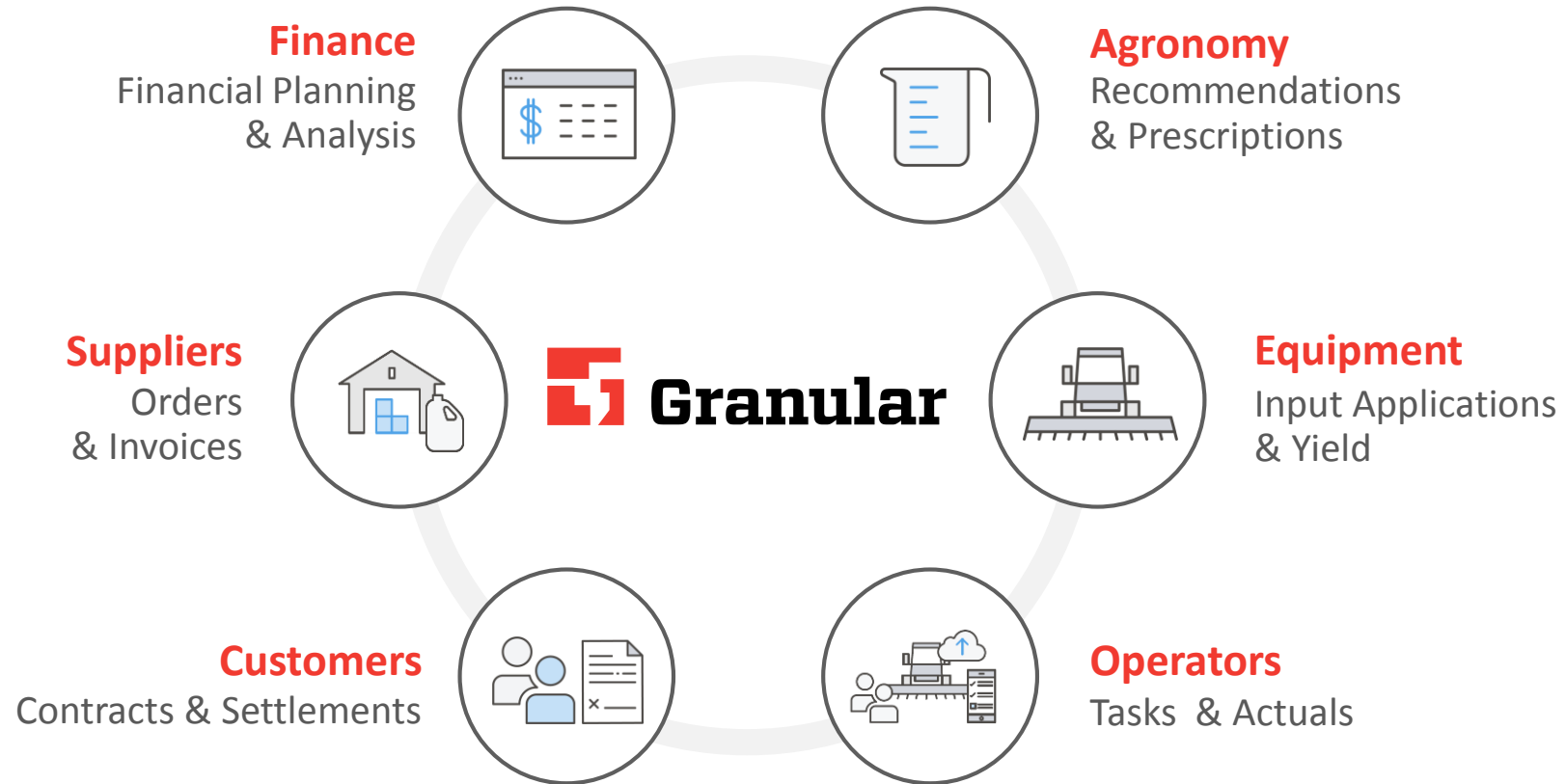


Agronomy

Business

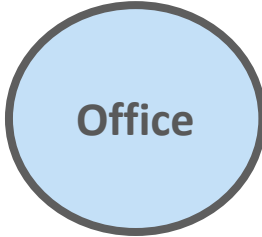
Land

The modern farm operating system

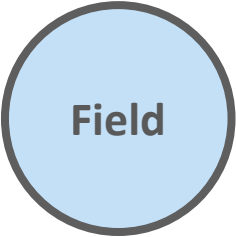


How it Works

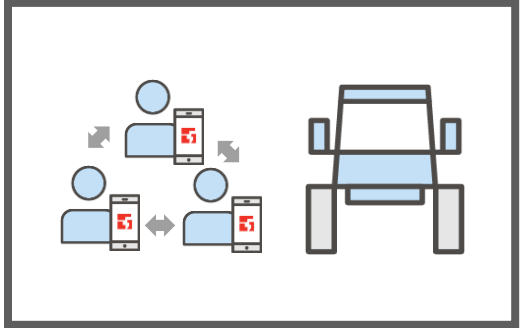
Record Keeping



Real-time Connection



Team Management



Business Management & Analysis

Operations



Financials



Inputs






Crops















Reports

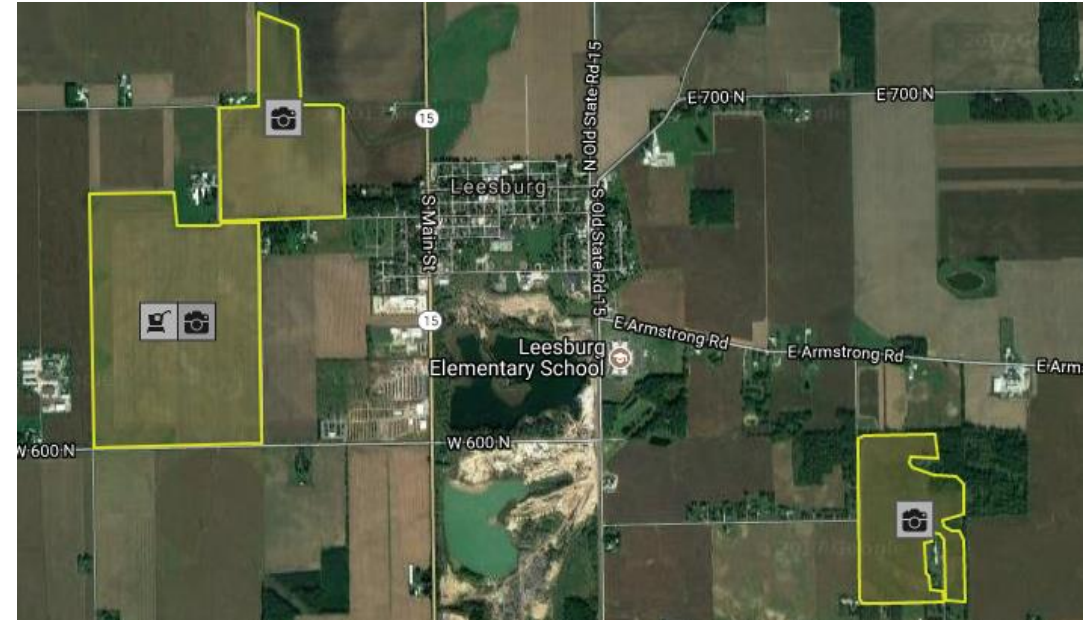


Make the plan, create the budget

- 
Corn Pre-Plant Spray COST
 Spraying \$77.41/ac
- 
Sidedress 28% COST
 Spraying \$73.50/ac
- 
Fungicide to tassel COST
 Spraying \$14.53/ac



CC 2017 Commercial Corn		+ Add Practice		⌵	⚙
	Dry AMS Spreading	2017-03-16	Input		⊖
	Field Cultivation	2017-03-26	Tilling		
	Corn Planting	2017-04-11	Planting		
	Ground Spraying	2017-05-05	Input		
	Scouting #1	2017-05-16	Scouting		
	Corn Post-Emerge Spray	2017-05-30	Input		
	Sidedress 28%	2017-06-15	Input		
	Scouting #2	2017-07-02	Scouting		
	Sidedress 28% w GS	2017-07-15	Input		
	Fungicide to tassel	2017-07-21	Input		
	Scouting #3	2017-08-16	Scouting		
	Corn Harvesting, Grain: 250.00 bu/ac	2017-10-02	Harvesting		



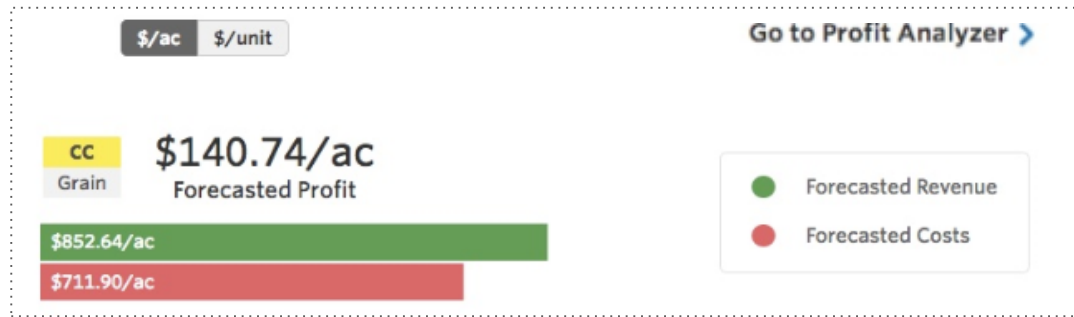
A pulse on your financials

	\$	\$/area	\$/unit
Profit Analyzer			
		cs Commercial Soybean - Grain	
		1,624.70 ac	102,842.73 bu
▶ Production Revenue	\$1,049,654.35	\$646.06 /ac	\$10.21 /bu
▶ Input Costs	\$329,170.45	\$202.60 /ac	\$3.20 /bu
▶ Land Costs	\$382,391.76	\$235.36 /ac	\$3.72 /bu
▶ Operating Costs	\$1,424.12	\$0.88 /ac	\$0.01 /bu
Contribution	\$336,668.02	\$207.22 /ac	\$3.27 /bu
▶ Fixed Costs	\$188,900.32	\$116.27 /ac	\$1.84 /bu
Profit	\$147,767.70	\$90.95 /ac	\$1.44 /bu

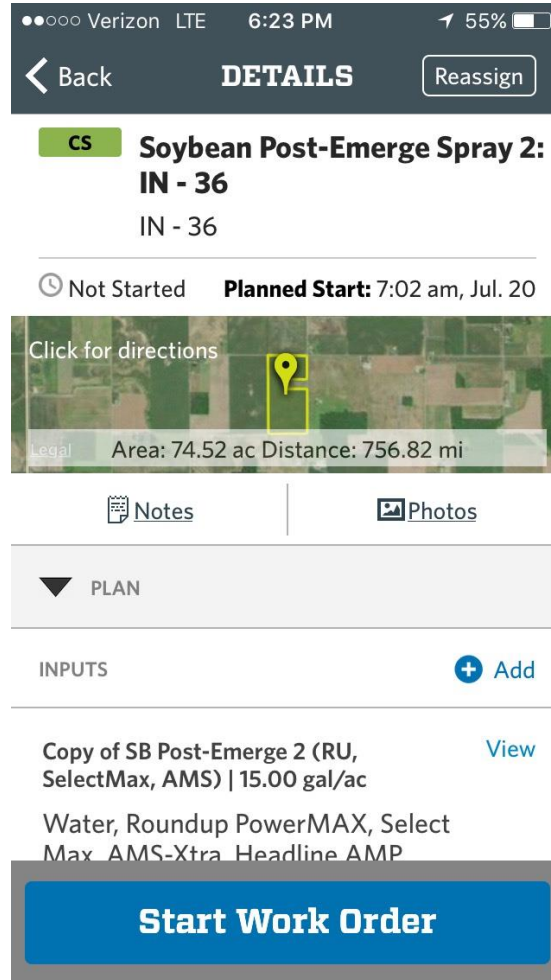
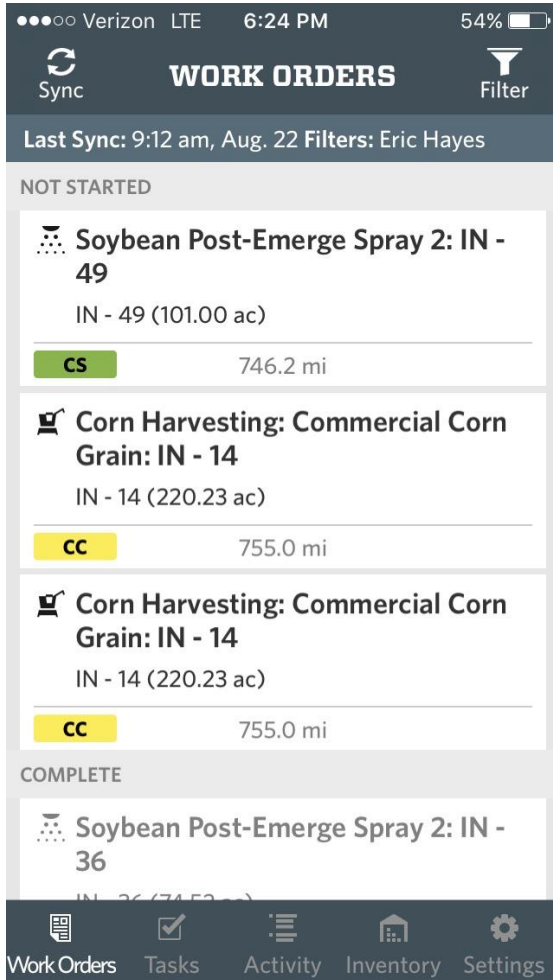
Breakeven by Crop

[Go to Profit Analyzer >](#)

Crop	Forecasted Yield	Breakeven Price
Commercial Soybean - Grain	70 bu/ac	\$7.29/bu
Commercial Corn - Grain	221 bu/ac	\$3.21/bu



Mobile task management



...and awesome machine data integration

Integrations

Available



JOHN DEERE

John Deere Operations Center

Import your Machine Data to generate Planting, Application, Tilling and Harvest Records automatically in Granular.



Reporting

Frye Farms

Landowner Yield Report  Granular

SUMMARY

CROP	AGREEMENT AREA	TRANSFER QTY.	AVG. MOISTURE	FINAL QTY.	YIELD	LANDOWNER SHARE	LESSEE SHARE
Commercial Corn - Grain	38.78 ac	485,880.00 lb	16.70 %	8,499.25 bu	219.17 bu/ac	4,249.62 bu	4,249.62 bu
Commercial Soybean - Grain	38.05 ac	120,520.00 lb	10.90 %	2,008.67 bu	52.79 bu/ac	--	2,008.67 bu

Blake 40

Sep 30, 2017 Corn Harvest Commercial Corn - Grain

Blake 40 None

LANDOWNER	BOUNDARY %	AGREEMENT AREA	TRANSFER QTY.	AVG. MOISTURE	PROCESSING ADJUSTMENT	FINAL QTY.	YIELD	LANDOWNER SHARE	LESSEE SHARE
Partner BB	100.00 %	38.78 ac	485,880.00 lb	16.70 %	-- bu	8,499.25 bu	219.17 bu/ac	4,249.62 bu	4,249.62 bu

Details

DATE (CDT)	DESTINATION	TICKET NO.	TRANSFER QTY.	MOISTURE	OPERATOR	FINAL QTY.	EQUIPMENT
09/30/2017 09:45 am	Biggs - Biggs	822388	35,940.00 lb	17.40 %	Noreen Frye	623.30 bu	Kreiling Trucking
09/30/2017 09:44 am	ADM Havana-Main - ADM	907809	56,860.00 lb	16.00 %	Noreen Frye	1,003.17 bu	Kreiling Trucking
09/30/2017 09:39 am	ADM Havana-Main - ADM	907795	53,120.00 lb	17.20 %	Noreen Frye	923.53 bu	Kreiling Trucking
09/29/2017 12:21 pm	ADM Havana-Main - ADM	907814	51,140.00 lb	16.50 %	W (FRYE) Wade Blakeley	896.78 bu	IH 8600
09/29/2017 11:27 am	ADM Havana-Main - ADM	90797	48,520.00 lb	16.80 %	W (FRYE) Wade Blakeley	847.71 bu	IH 8600
09/29/2017 11:26 am	ADM Havana-Main - ADM	907777	48,600.00 lb	17.00 %	W (FRYE) Wade Blakeley	847.03 bu	IH 8600
09/29/2017 09:31 am	ADM Havana-Main - ADM	907761	46,060.00 lb	16.80 %	W (FRYE) Wade Blakeley	804.73 bu	IH 8600
09/29/2017 09:31 am	ADM Havana-Main - ADM	907746	45,960.00 lb	16.70 %	W (FRYE) Wade Blakeley	803.97 bu	IH 8600
09/28/2017 06:51 pm	ADM Havana-Main - ADM	907727	50,220.00 lb	16.50 %	W (FRYE) Wade Blakeley	880.64 bu	IH 8600
09/28/2017 05:48 pm	ADM Havana-Main - ADM	907708	49,460.00 lb	16.40 %	W (FRYE) Wade Blakeley	868.38 bu	IH 8600
			485,880.00 lb	16.70 %		-- bu	8,499.25 bu

Blakeley W 97 S

Oct 31, 2017 Soybean Harvesting Commercial Soybean - Grain

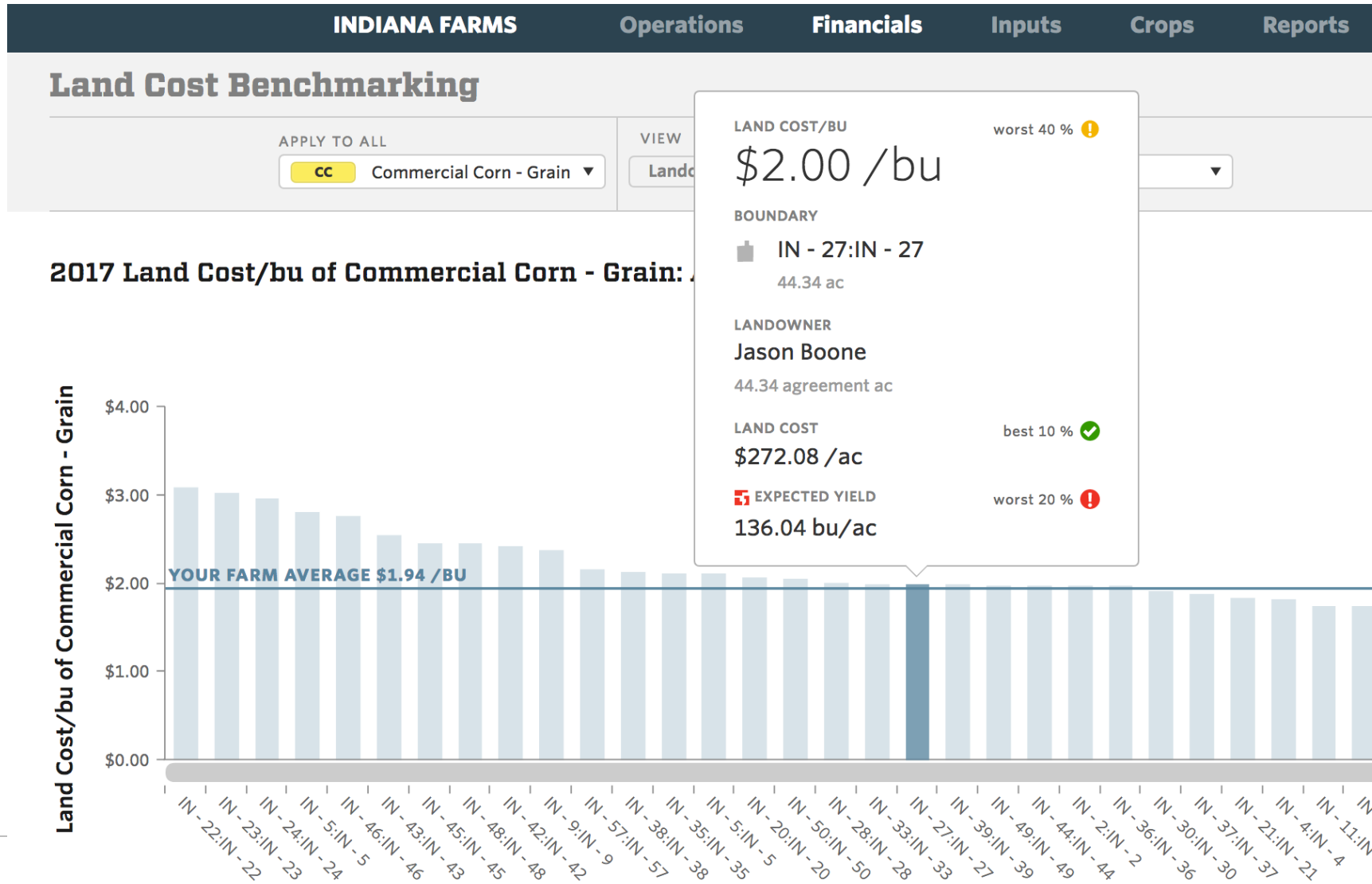
Blakeley W 97 S None

LANDOWNER	BOUNDARY %	AGREEMENT AREA	TRANSFER QTY.	AVG. MOISTURE	PROCESSING ADJUSTMENT	FINAL QTY.	YIELD	LANDOWNER SHARE	LESSEE SHARE
Unspecified	100.00 %	38.05 ac	120,520.00 lb	10.90 %	-- bu	2,008.67 bu	52.79 bu/ac	-- bu	2,008.67 bu

Details

DATE (CDT)	DESTINATION	TICKET NO.	TRANSFER QTY.	MOISTURE	OPERATOR	FINAL QTY.	EQUIPMENT
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Measure, manage, and improve



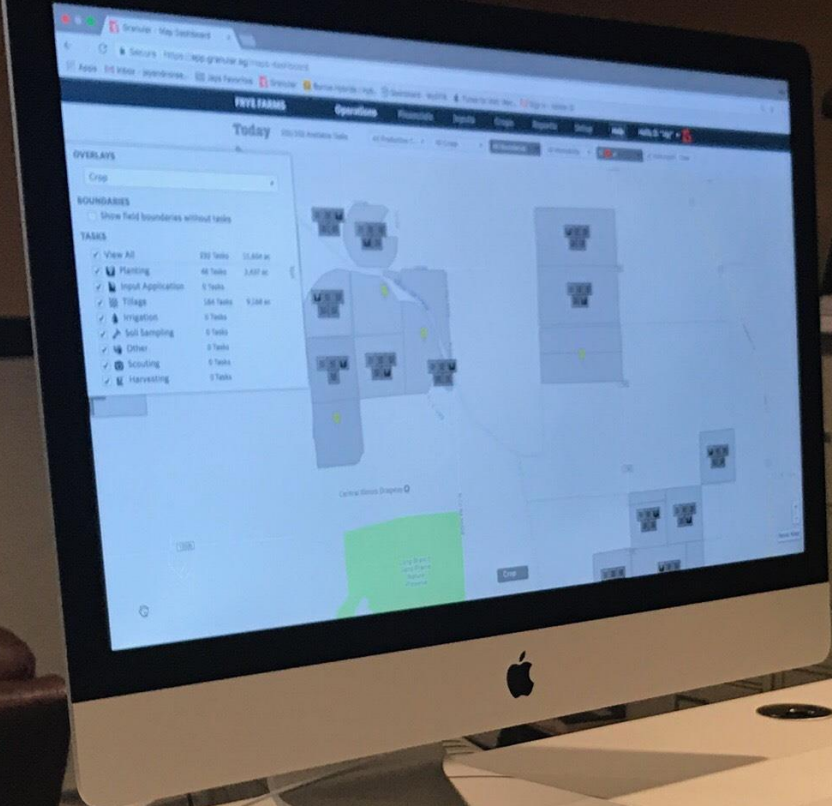
KEY TAKE - AWAYS

Digital Agriculture is the standardization of data in a connected and protected cloud software platform

Near term ROI comes from your judgments and decisions gleaned from more precise and real-time information

Future ROI will come to the early adopters that will allow for greater access to automation, decision tools, easy buttons, and advanced analytics

Don't underestimate the intangible value of communication, learning, and transparency that comes to the team / family





\$547,140

Land ownership – online plat book
Valuation model across Midwest
Historical sales
Digital marketplace

ACREVALUE CSR₂
\$10,465/ac 77
PARCEL
105.9 ac
APN: 024-02924-0000
OWNER (04/15/12)
Acme Holdings LLC.

2 FIELDS Get Full Report

SELECTED FIELDS (392 ac) Clear All

ACREVALUE 

\$10,465/ac

AVG SLOPE CSR₂
4.5% 77

OWNER (04/15/12)
ACME Holdings, LLC



Unique MULTI-STATE LAND PORTFOLIO
AUCTIONS

Mercer & Fulton Counties, IL

**8,638[±]
Acres**

**8,253[±] Cropland Acres
(FSA)**



Enion 32

10

100

1550E

1400N

1320N

17

15

16

13

14

19

18

21

12

10

9

20

11

8

78

7

Matanzas Beach

78

6

5

1

4

1200N

1200N

2

1

3

Illinois River

Illinois River

Valuation

Soil Survey

Crop History

Ownership

ACREVALUE

\$8,250

COUNTY AVG

\$6,055

ECONOMIC ATTRIBUTES

Fulton County is a moderate tax county.
This land is in a low livestock demand area.

Basis: -\$0.02

AVG PI

122.0

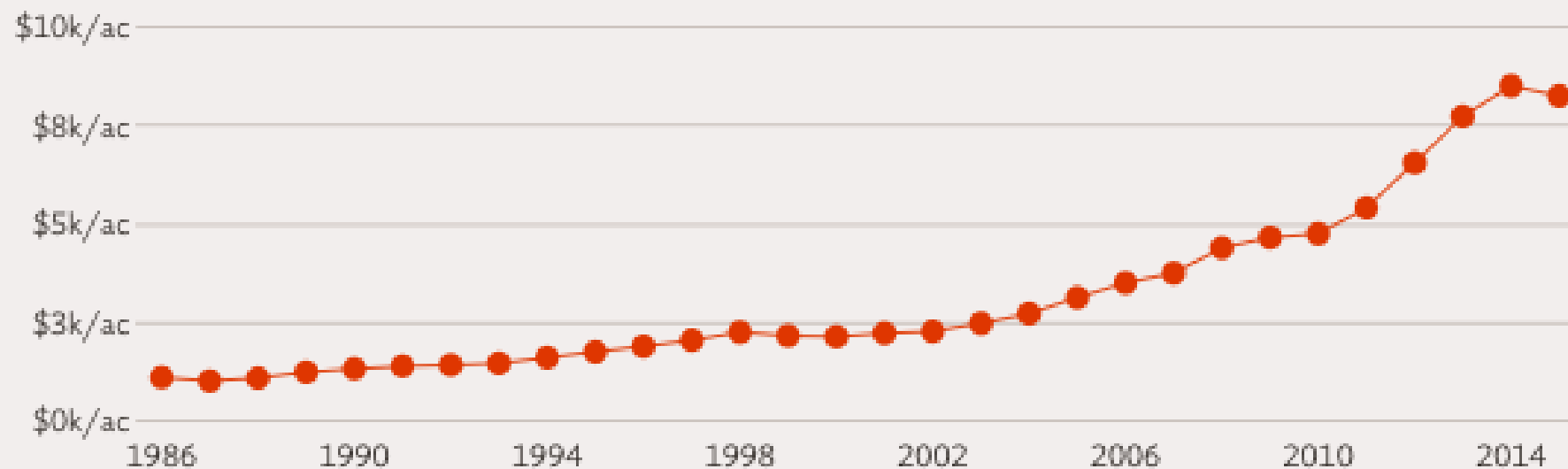
COUNTY AVG

109.3

PHYSICAL ATTRIBUTES

Annual Rainfall: 38.41 inches
Annual GDD: 3,352

LAND VALUE HISTORY



REPORTS

Valuation

Soil Survey

Crop History

Ownership

AVG PI **122.0** COUNTY AVG 109.3 Source: NRCS Soil Survey

All fields 3,596 ac

SOIL CODE	SOIL DESCRIPTION	ACRES	PERCENTAGE OF FIELD	SOIL CLASS	AVG PI
8404A	Titus silty clay, 0 to 2 percent slopes, occasionally flooded	2,202.46	61.3%	3	118.0
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded	749.59	20.8%	2	132.0
8284A	Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	338.30	9.4%	2	134.0
150B	Onarga fine sandy loam, 2 to 5 percent slopes	97.96	2.7%	2	108.0
88B	Sparta loamy fine sand, 1 to 7 percent slopes	66.45	1.8%	4	90.0
102A	La Hogue loam, 0 to 2 percent slopes	56.42	1.6%	1	121.0
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded	31.28	0.9%	2	114.0
198A	Elburn silt loam, 0 to 2 percent slopes	20.01	0.6%	1	143.0
9068A	Sable silty clay loam, terrace, 0 to 2 percent slopes	17.19	0.5%	2	143.0
199B	Plano silt loam, 2 to 5 percent slopes	9.56	0.3%	2	139.0
...	Shaffton clay loam, 0 to 2 percent slopes, occasionally



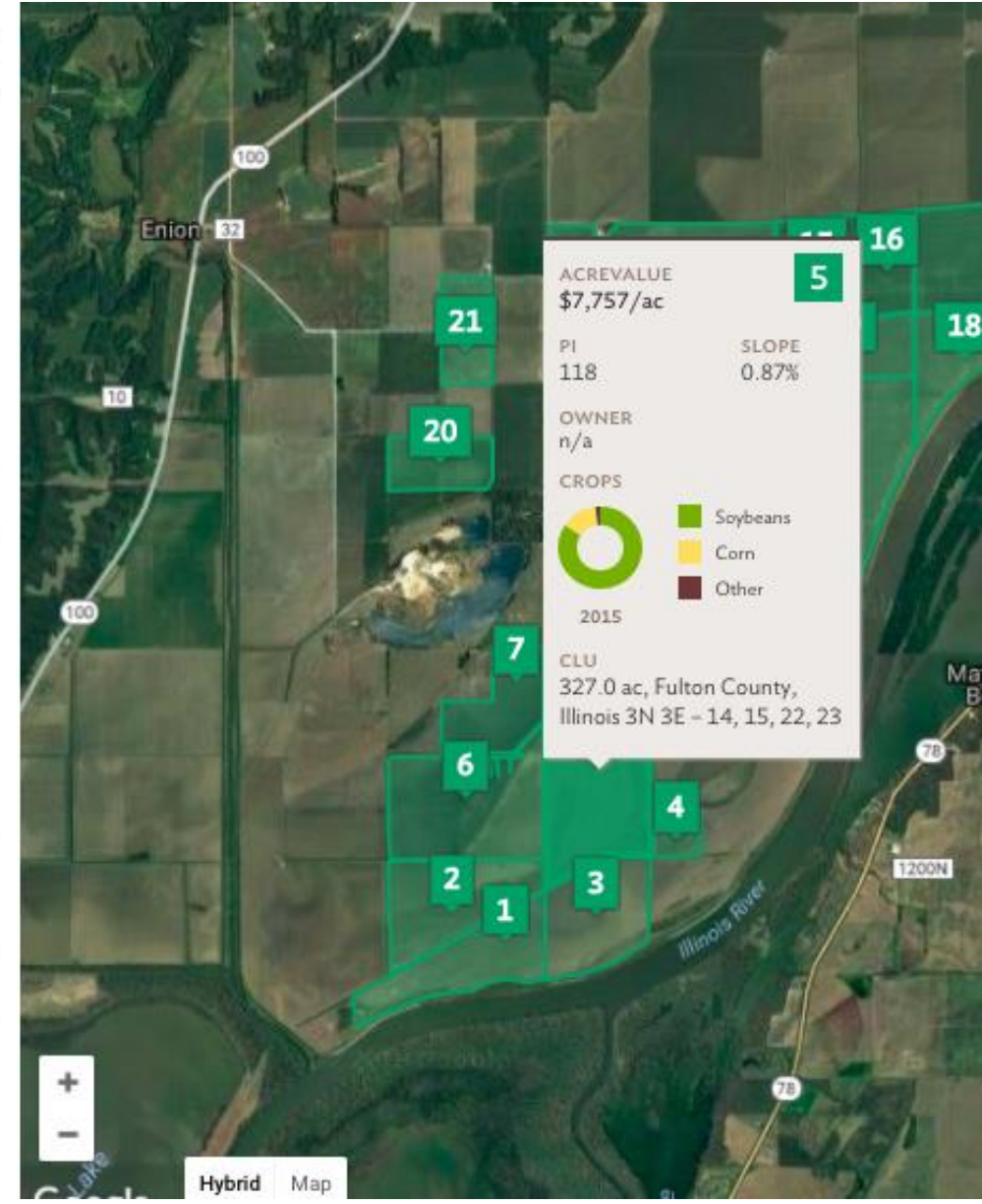
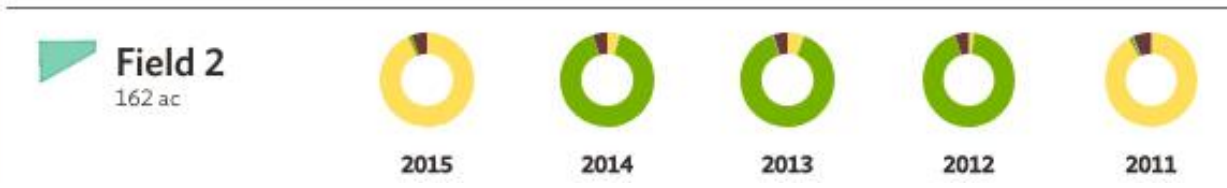
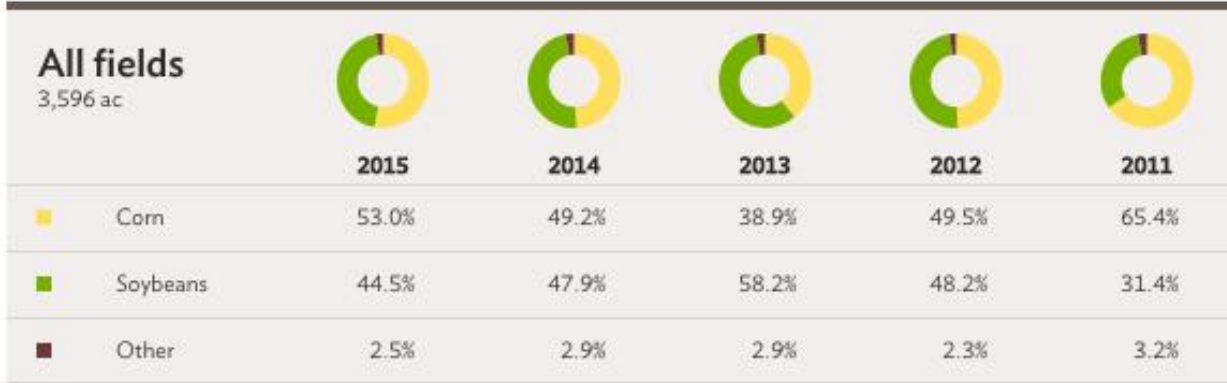
REPORTS

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Thank You!

Questions?

 @GranularAg

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