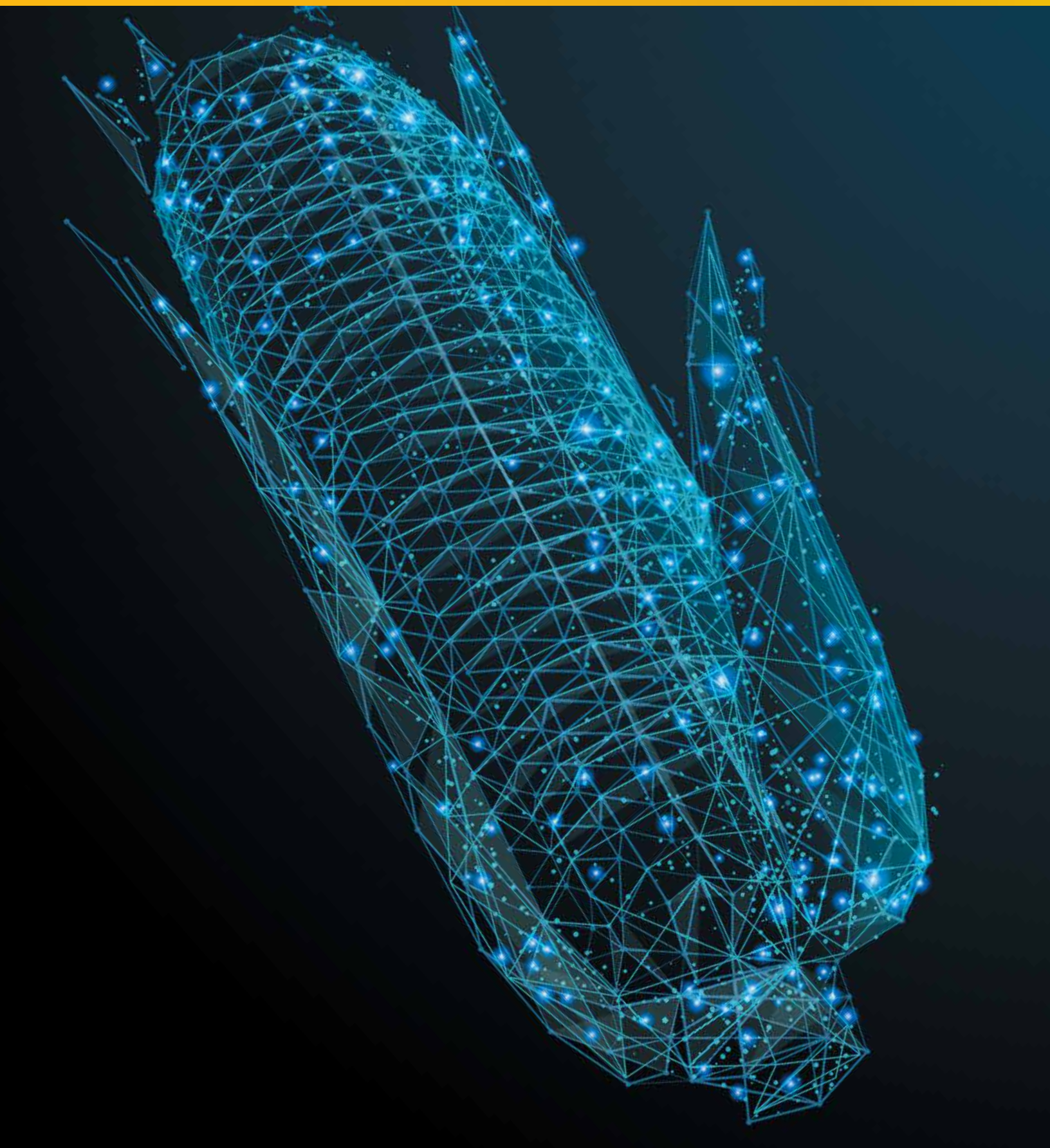
YOUR FARM RUNS ON DATA

Data is fuel for your operation

JOHN DEERE



YOUR FARM RUNS ON DATA

At a minimum, you keep track of what you use and what you grow, what you spend and what you earn, where you've been and where you're going. Every day, you manage a lot of details: seed varieties, machine logistics, fuel usage, tillage techniques, labor schedules, yield projections … the list goes on and on and on.

You choose how to manage your data.

You have high- and low-tech options for managing your data. Systems, monitors, and sensors. Notebooks, ledgers, and records. Your own memory, ideas, and instincts. The right mix of these methods is up to you. You'll know you've chosen wisely when you experience improvements in:

Knowledge. You're equipped with the right information when you need it to make your next big or small decision.

Time. You spend time and energy on what matters most to you—whether on the farm or away from it.

Profit. You notice your business becoming more efficient, productive, and profitable.

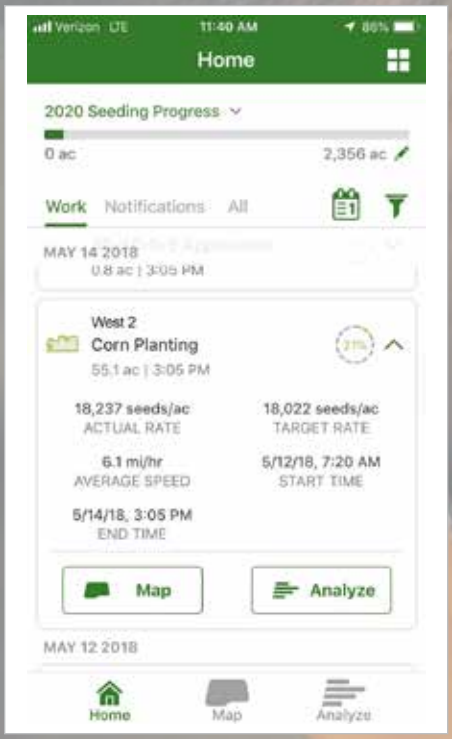
Digital tools put data where you can see, share, and use it.

Digital tools are the systems and apps that help you collect, share, and analyze information from and for your operation. Whether you're totally new to this technology, somewhat familiar, or a full-on expert, digital tools can help you solve basic and complex problems. At a minimum, they can simplify and automate your recordkeeping. Used at full force, they can help you evaluate and improve your farm's performance.

The more you tap into the power of data, the greater your potential for gains. But even basic use of John Deere's data management tools can bring savings and efficiency to your operation. Here are a few ways you can use data to make smart decisions about situations that challenge your operation.

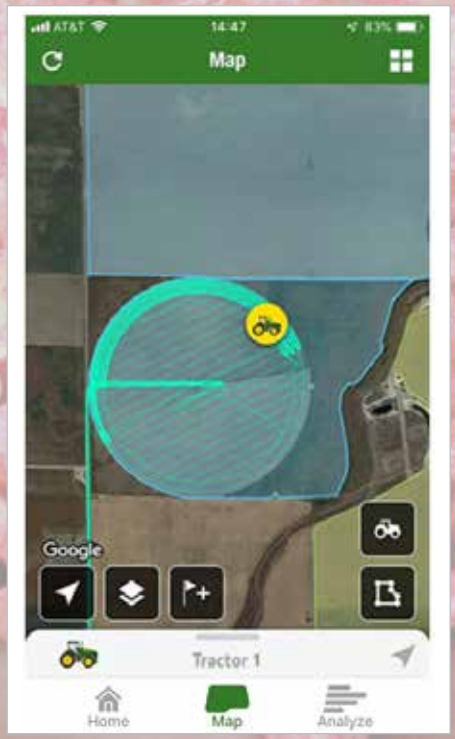
CONTENTS

CHOOSE TOP-PERFORMING SEED VARIETIES



View planting job details in work summary cards

View planting data layers and share PDF reports



View the location history of each machine and monitor progress

Plan Varieties for Maximum Yield

It's late fall, and you've wrapped up harvest for the year. But have you started planning for planting? Do you know how each variety yielded last year? Do you want to try any new varieties this year? Where are you placing your bets for success?

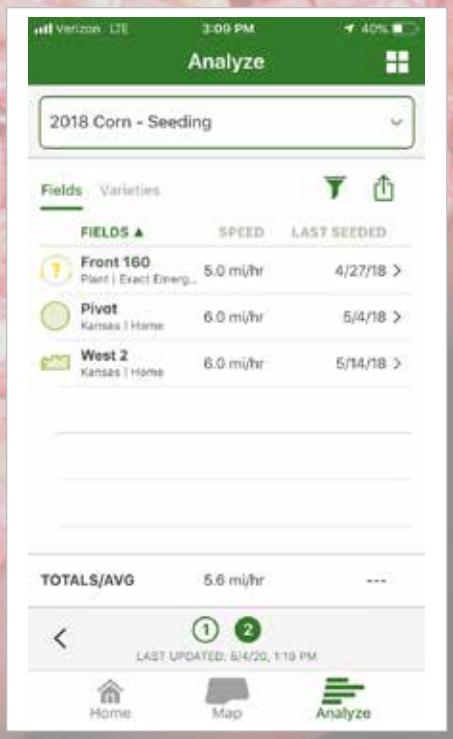
Inside John Deere Operations Center, you can determine what varieties yielded the best last year and plan which crops and varieties to plant in each field this year. So, when the weather and field conditions are right, you or your operator will be ready to go, knowing which variety to plant where.

Monitor and Control Your Operation from the Palm of Your Hand

Whether it's you driving the tractor or someone else, you have to know what's going on. Where are your machines? Are the settings right? Are you planting the varieties you intended in each field? How close are you to finishing the job?

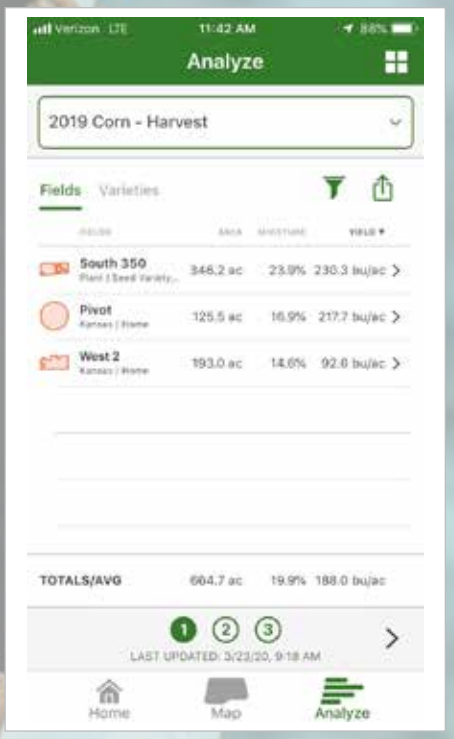
Using the MyOperations™ app, you can see what's happening now and in the past:

- Machine location and history
- Job details like population rates, varieties, speed, start and stop times
- Machine settings
- Progress in each field
- Maps of what you planted where



View field plant dates

View variety performance across your operation



View harvest details by field

Analyze Your Success at Harvest

It's harvest time, and you are about to see the results of your work. Which field did you plant first? How did each variety perform? Do you have a picture of your total yield?

John Deere offers several tools that can help you do the job of harvesting and evaluating your year's performance. The MyOperations™ app provides quick reference points to help you decide when and where to harvest. At a glance you can know:

- When you planted each field
- Which varieties you planted where
- Moisture content from your completed passes

When the job is done, you can dig deeper into your harvest results. Inside the Operations Center you can analyze:

- Which varieties performed the best
- Your total bushels of each crop from the year
- Machine and operator performance

CHOOSE TOP-PERFORMING SEED VARIETIES

After analyzing your year's success, you can start to prepare for next season. With all your data in one place you can easily organize and share details with trusted partners like your agronomist, banker, or landlord. As you continue building the historical record of your operation's performance, you will be even better positioned to make decisions in the future.

VARIETIES	TOTAL DRY YIELD (bu)	AVG. DRY YIELD (bu/ac)	WET WEIGHT (lb)	AVG. WET WEIGHT (lb/ac)	AVG. MSTR (%)	AREA WORKED (ac)
Variety A	1,511.53	222.58	84,801.35	12,487.48	14.83	6.79
Variety B	11,924.01	223.22	678,436.82	12,700.25	16.34	53.42
Variety C	13,852.98	213.44	803,298.08	12,376.96	17.92	64.9
Not Seeded	34.51	88.99	1,978.37	5,101.57	16.92	0.39
TOTAL	27,323.03	217.71	1,568,514.61	12,498.07	17.07	125.5

The map on the left shows harvest results for a particular field

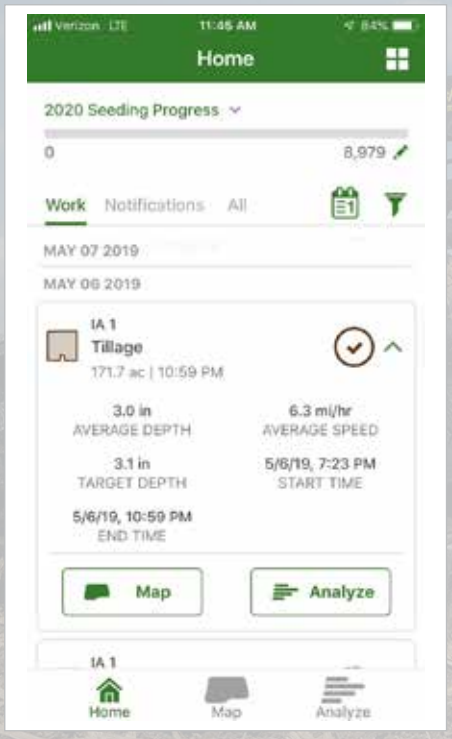
The map on the right shows the three seed varieties planted in that field

This grower was testing Variety A as a new seed variety for this field. The harvest yield map reveals a clear line, showing that both Variety A and Variety B out-performed Variety C.

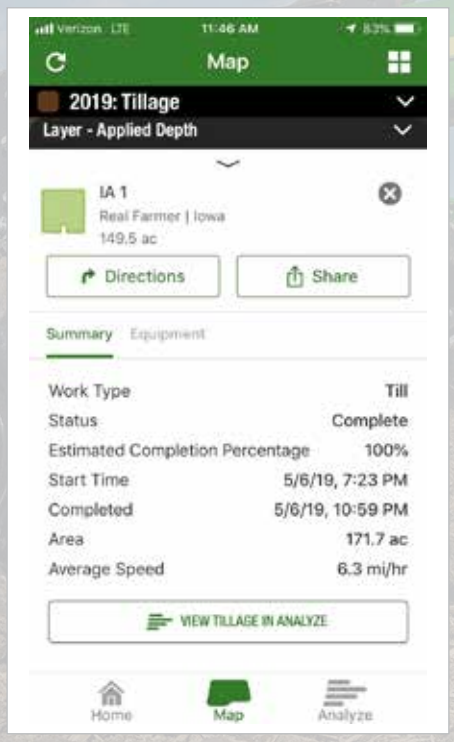
To go even deeper in analyzing these yield differences by variety, you can look at the details in the Data Analysis drawer (the table of data below the maps).

The data shows that Variety A yielded within one bushel per acre of top-performing Variety B in this field. Variety C fell short, performing 10 bushels per acre less than Varieties A and B. Digging into the data at this level can help you decide what to plant again next year—and what to leave out of the mix.

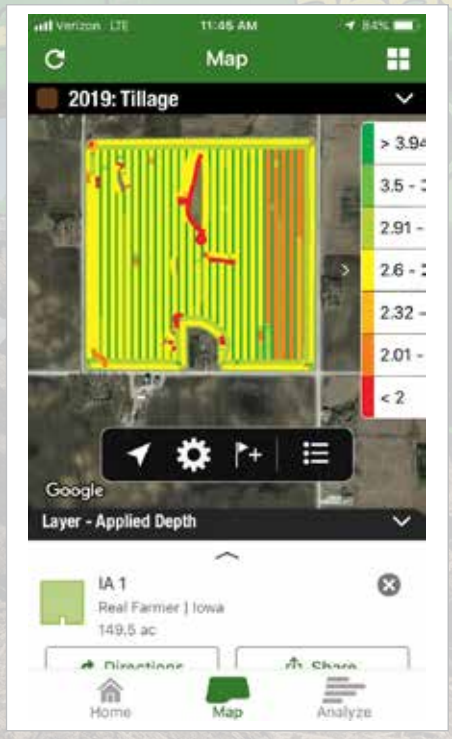
CALCULATE WAYS TO PRODUCE EVEN MORE



View tillage job details in work summary card



Get driving directions to field and share PDF of completed work



View tillage data layers and share PDF reports

Plan from Last Season's Collected Data

Looking at last season's collected data can help you plan for each production step this year. Have you looked at last season's tillage data? Did you or your operator meet the planned speed and depths? Have you decided which fields will be worked in the fall, spring, both, or no-till? Did you see a relationship between your tillage settings and yields?

Inside the Operations Center you can see how well you and your tillage operators completed work compared to the target plans. You can also look for high or low performing areas of the field and determine if any variations in tillage settings made an impact. Based on these insights, you can create a plan that will help you maximize crop production.

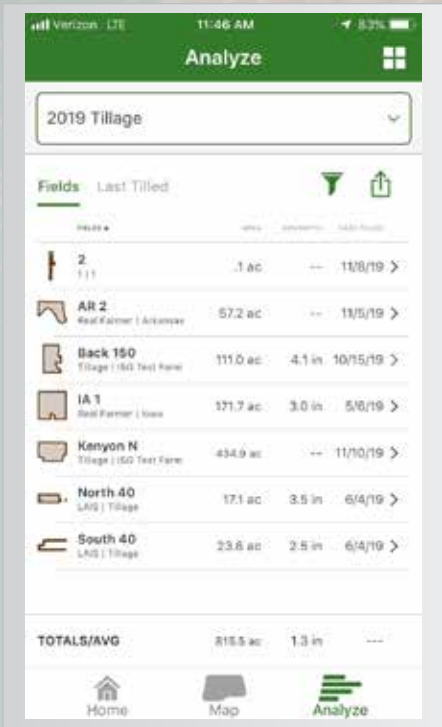
Monitor and Control Your Operation from the Palm of Your Hand

Whatever the job, you want a clear view of what's happening. Where are your operators? Are your machines in the right field? Is the job getting done to your standards? Which fields still need to be worked?

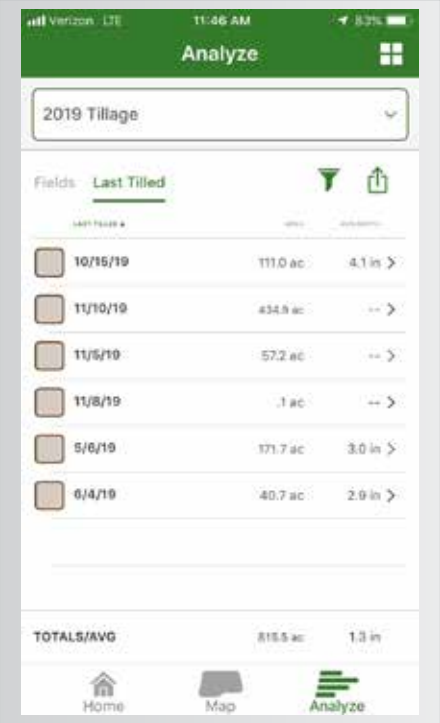
Using the MyOperations app, you can see what's happening now and get a quick refresher on what remains to be done:

- Machine location and history
- Job details like area covered, average speed, average depths, and start and stop times
- Progress in each field
- Maps that show where you achieved specific speeds and depths

CALCULATE WAYS TO PRODUCE EVEN MORE



View tillage details by field



View tillage job details by date

Analyze Your Residue Management Plan at Harvest

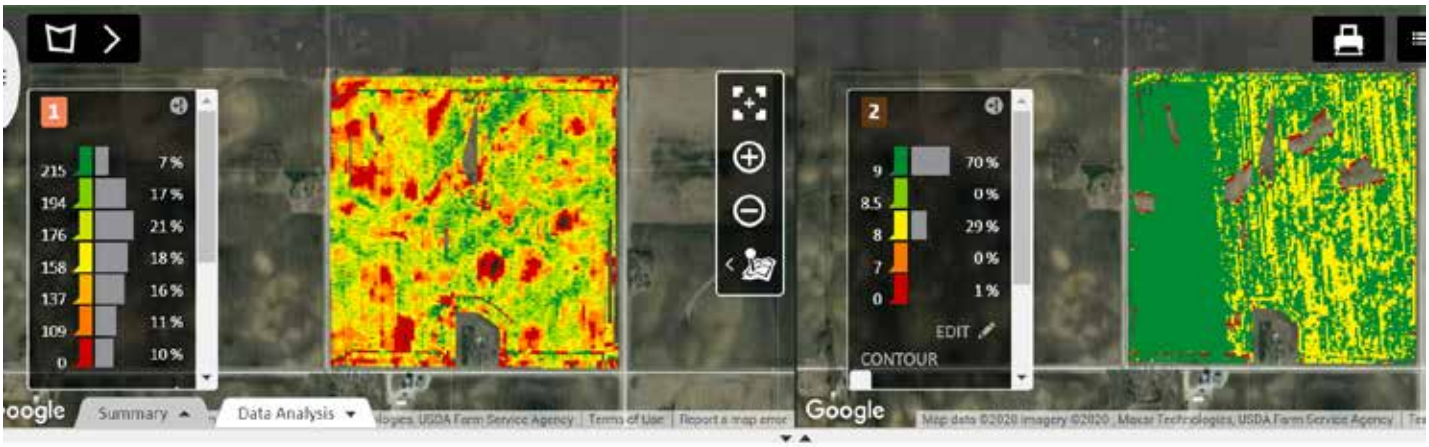
Harvest is wrapping up. Before you start preparing the ground for next season, you could really use a good assessment of how your residue management affected each field. If you varied settings on the tillage pass, did those changes result in varied yields? Did testing a new practice—such as no-till or tilling at a different time of year—help or hurt your yields? Did your machine operators follow directions?

John Deere offers several tools that can help you evaluate your operation and how your tillage passes or no-till fields performed. The MyOperations app provides quick reference points about your tillage passes. At a glance you can see:

- Which fields you tilled
- When you tilled each field
- Average depth of tillage achieved

When the job is done, you can dig deeper into the impact of your tillage practices field by field. Inside the Operations Center you can analyze:

- How tillage setting changes in a field correlated with yields
- Machine and operator performance
- How a new tillage practice affected performance in a field



AS APPLIED DEPTH (in)	TOTAL DRY YIELD (bu)	AVG. DRY YIELD (bu/ac)	WET WEIGHT (lb)	AVG. WET WEIGHT (lb/ac)	AVG. MSTR (%)	AREA WORKED (ac)
≥ 9	15,820.42	163.83	903,684.75	9,358.2	16.67	96.57
8.5 - 9	---	---	---	---	---	---
8 - 8.5	6,757.79	170.86	386,226.04	9,765.25	16.72	39.55
7 - 8	19.27	149.58	1,102.09	8,553.19	16.76	0.13
0 - 7	300.03	154.94	17,079.07	8,820.08	16.33	1.94
Not Tilled	877.91	138.64	49,893.24	7,879.22	16.25	6.33
TOTAL	23,775.42	164.52	1,357,985.19	9,396.87	16.66	144.51

The map on the left shows 2018 harvest results

The map on the right shows how this field was prepared in Fall 2017

Notice that the lowest yields ("hot" spots on the first map) are concentrated more on the left side of the field. This field was tilled at two depths (shown on the second map): dark green indicates tillage at 9" and deeper, while yellow shows a tillage depth between 8" and 8.5". At a glance, it looks like shallower tillage resulted in higher yields in this particular field.

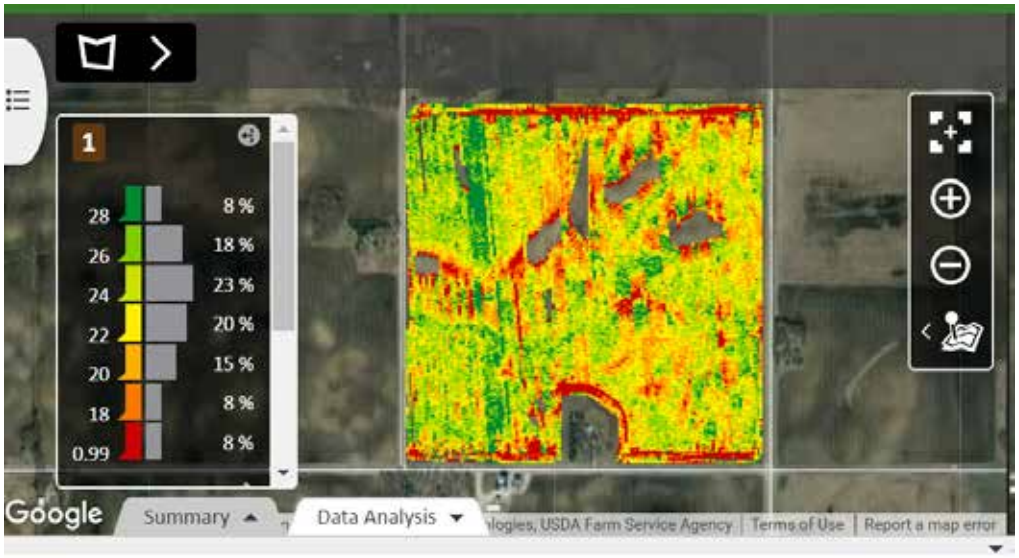
To get an even better look at how these two maps correlate, notice the details in the Data Analysis drawer (the table of data below the maps). Reading across the rows of data, you can see that areas tilled at 9" or deeper had an average yield of 164 bu/acre, while areas tilled at 8" to 8.5" had an average yield of 171 bu/acre. That's a 7 bushel increase in areas with the shallower tillage setting. The shallower tillage pass is one of several factors that contributed to this extra yield.

Working from information like this, you can make decisions about how to adjust your tillage passes to improve yields. Keep tracking this data over time, and in a few years, you may be able to pin down the precise tillage depth that's best for your field.

The Operations Center also offers maps that show how different operators perform their work—how fast, how accurately, how true to your plan. Reviewing these maps may give you insights that help you find your best operator for each job.

CALCULATE WAYS TO PRODUCE EVEN MORE

After analyzing the full story—from tillage through harvest—you will be more prepared to plan your next steps. Maybe your current tillage practices provide the results you want, or maybe you've discovered some details that suggest you should make some changes. Whether you land on one clear answer or a set of workable options, you'll have solid ideas about how to take your operation to the next level.

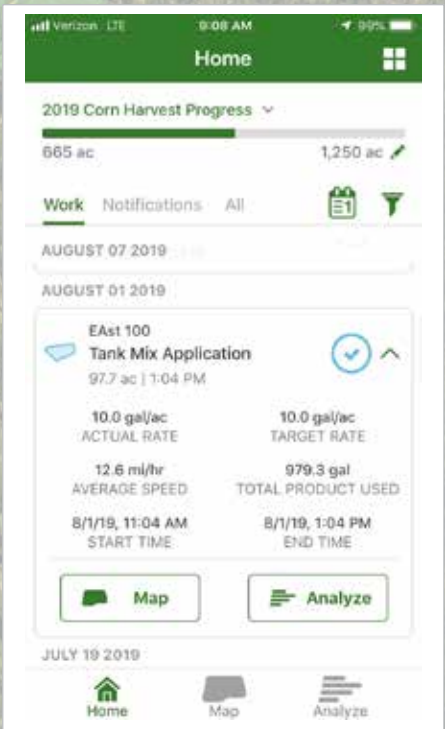


AS APPLIED DEPTH (in)	FUEL RATE PER HOUR (gal/hr)	AREA WORKED (ac)
≥ 9	23.66	101.73
8.5 - 9	---	---
8 - 8.5	22.57	43.06
7 - 8	22.35	0.21
0 - 7	18.78	2.43
Not Tilled	---	---
TOTAL	23.22	147.42

Deeper tillage depth resulted in higher fuel rates per hour

Yield and depth are two important aspects of this story. Now, what about fuel? Here's another view of that same field. Here, green represents the areas of highest fuel consumption. Based on the colors in the map and the Data Analysis drawer (the table of data below the maps), you can see that areas tilled 9" or deeper used more fuel than those tilled at the shallower 8" to 8.5". In this field, tilling at the shallower depth not only generated higher yields, it burned less fuel.

EVALUATE THE SUCCESS OF EACH PASS



View application job details in work summary card

View application data layers and share PDF reports

Plan Your Application Trials

It's important to have a plan in place—not just for planting and harvest, but throughout the growing season. How will you control weeds and diseases? Are you spraying the fields yourself or hiring a custom applicator? Which fungicides will you apply and where?

Inside the Operations Center, you can look back at what you applied to each field last year so you can start making decisions for season to come. You can also plan how you'll use your products—giving you or your operator a convenient way to document exactly what you've applied, when, where, and how.

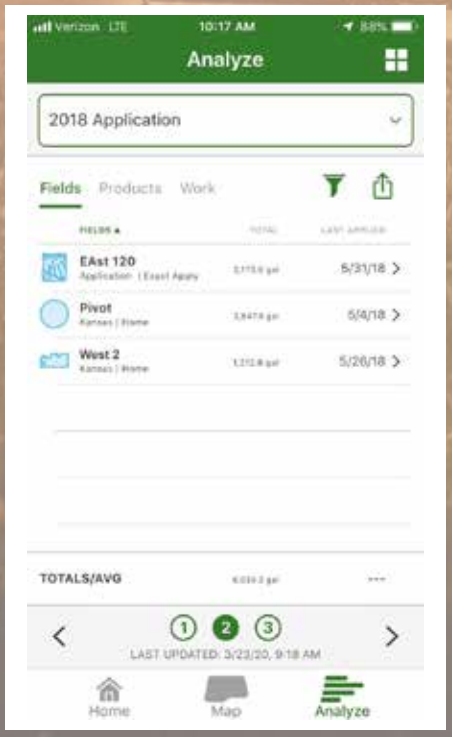
Monitor and Control Your Application Passes

Application can be a costly, sensitive process. To be sure you're using those inputs wisely, you need to keep track of all the details associated with every application pass. Was the right product applied? Which fields were completed today? How much product did we use?

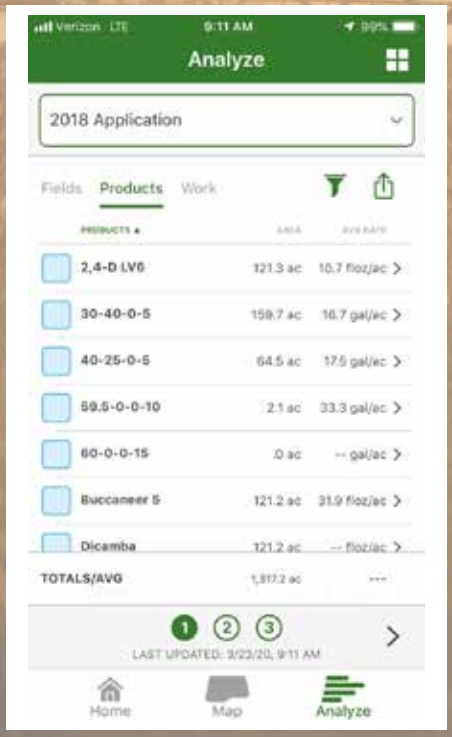
Using the MyOperations app, you can see what's happening now and in the past:

- Job details like product type, actual rate, speed, total product used, and start and end times
- Progress in each field
- Maps of where product was applied
- Machine location and history

EVALUATE THE SUCCESS OF EACH PASS



View application details by field



View summary of products applied

Analyze Your Application Results after Harvest

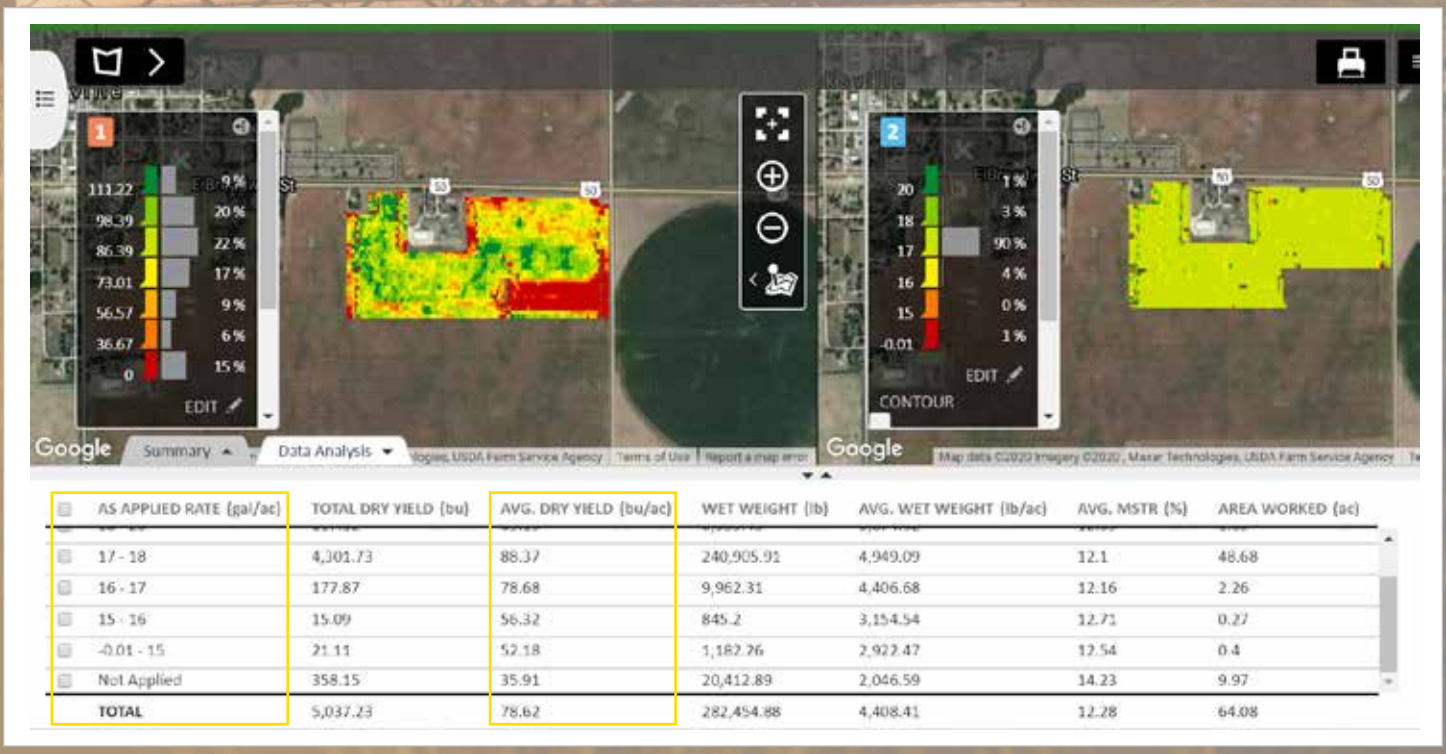
Once harvest wraps up, you can dig into details of the year's work to see how each field performed and how various factors played into your yields. Which fields received an application of fungicide? What products did you use this season? How did each application pass affect your yields?

The MyOperations app provides quick reference points to review your application passes from the year. At a glance you can know:

- Which fields had product applied and total area covered
- When each field had product applied
- List of all products used each season

Inside the Operations Center, you can dig even deeper into your results by analyzing:

- Which application products boosted or maintained yields
- Operator and machine performance
- Impacts of products and rates



AS APPLIED RATE (gal/ac)	TOTAL DRY YIELD (bu)	AVG. DRY YIELD (bu/ac)	WET WEIGHT (lb)	AVG. WET WEIGHT (lb/ac)	AVG. MSTR (%)	AREA WORKED (ac)
17 - 18	4,301.73	88.37	240,905.91	4,949.09	12.1	48.68
16 - 17	177.87	78.68	9,962.31	4,406.68	12.16	2.26
15 - 16	15.09	56.32	845.2	3,154.54	12.71	0.27
-0.01 - 15	21.11	52.18	1,182.26	2,922.47	12.54	0.4
Not Applied	358.15	35.91	20,412.89	2,046.59	14.23	9.97
TOTAL	5,037.23	78.62	282,454.88	4,408.41	12.28	64.08

The map on the left shows harvest results for a particular field

The map on the right shows application of fungicide to that field

This map of field information, as an example, shows a product was applied to most of the field, but not all. Notice the lower right corner of the second map, where there was no application. That same area on the harvest map shows very low yield suggesting the lack of product applied impacted yield performance.

As further evidence of what happened, you can look at the Data Analysis drawer (the table of data below the maps), which shows not only harvest yield and application data, but application rate.

DATA IS FUEL FOR YOUR OPERATION

At John Deere, we like to say that data is fuel for your operation. It's a valuable asset you can use to produce the best possible results—every pass, every season, every year.

What's the real value of your data?

Knowledge. It's having the right information when you need it to make decisions.

Time. It's feeling certain you're spending time on actions that will generate positive results.

Profit. It's doing everything you can to run an efficient, productive, profitable business.

On these pages, we've illustrated just a few ways you could turn data into value for your operation. As you explore the data management tools available, you'll discover many more.

Where do you begin?

The John Deere Operations Center is a great starting point. It's like home base for your operation—a place to collect, organize, and analyze your data. It's also a gateway to many other data management tools designed to tackle specific tasks like analyzing yield, keeping track of inputs, and creating prescriptions.

How do I get data in the Operations Center?

You can upload data into the Operations Center by using a USB, Mobile Data Transfer or Wireless Data Transfer. Learn more about data uploading at **JohnDeere.com/OpsCenterUploadData.**

Can I bring data into the Operations Center if I am not using all John Deere equipment?

Yes. Learn which displays and file types are compatible with the Operations Center at **JohnDeere.com/OpsCenterCompatiblity.**

How do I get started in the Operations Center/MyOps?

To access the Operations Center you need to a MyJohnDeere account. Visit **JohnDeere.com** to register. Once you have a MyJohnDeere account you will select Operations Center from the dashboard. You will be prompted to create an organization. Use this link for step by step instructions.

Where do I learn more about the Operations Center?

- Help Documentation is accessed inside the Operations Center
- Your local John Deere Dealership
- **JohnDeere.com**
- **JohnDeere.com/OpsCenterHowTos**

Who can I share my data with?

Share only the data you want with only the people you trust to help you get the job done. Need help? To read more visit **JohnDeere.com/OpsCenterDataSharing** or visit **JohnDeere.com/OpsCenterHowTos** to watch a "How To" video.

Concerned about your data security and privacy?

John Deere remains committed to ensuring security and privacy controls are in place regarding a farmer's data. Ultimately, you have control of your data and can choose to allow access to trusted business partners critical for your operation. Visit **JohnDeere.com/Trust** to learn more.

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