

Fieldprint Platform Data Quality Analysis Tool

Description

Field to Market staff have developed an interactive, web-based Quality Analysis (QA) Tool to assist project administrators, project specialists, data entry personnel, and consultants with reviewing their data inputs and results obtained via the Fieldprint Platform from registered Field to Market projects. The QA Tool supports the ability to detect outliers, find errors, and gain insights from the project data and results. As with any modeling approach, project reporting output is only as good as the data inputs. A robust quality analysis by project administrators, specialists, or other personnel enhances confidence in the Fieldprint Platform data.

Version 3.0 of the Fieldprint Platform incorporates various mechanisms to improve data quality. Most are focused on preventing data input errors via the user interface. For example, set data input boundaries in the Platform prevent growers from entering excessive (out of range) values for inputs of high impact, such as maximum values for fertilizer amounts and crop yield. The Platform also includes warnings or prompts to alert growers when values might be incorrect. Where necessary, the Platform provides users with contextual help to address ambiguity. However, despite these efforts, it would be impractical to assume all data quality issues can be mitigated. Those charged with reviewing project reporting data should anticipate the need for data quality review.

Project administrators and specialists have access by permission to project reporting tools within the Fieldprint Platform. The primary project reporting product is the Microsoft Excel-based Comprehensive Data Output File. For each grower connected to the project, the report contains detailed, finalized grower input and output by crop year. The size of the Excel report is dynamic, it has as many rows as crop years, and the number of columns will vary according to the number of trips for the application of fertilizers and crop protectants, along with the number of harvest operations for crops such as alfalfa. This dynamic number of rows and columns could make it difficult to automate Excel processes that depend on columns staying in fixed positions. It can also be cumbersome to find columns of interest within a file with hundreds of columns.

The goal of the QA Tool is to help project administrators conduct quality analysis in a consistent manner across all projects; however, the QA Tool is not intended to replace other data entry quality assurance mechanisms that project administrators implement with growers within projects. We highly recommend thoroughly reviewing the Comprehensive Data Output Report at the end of each growing season before using the data for storytelling, summaries, and official reports.

What do I need to use the QA Tool?

Project administrators and specialists need to export the Microsoft Excel-based **Comprehensive Data Output File** using the project reporting functionality in the Fieldprint Platform. For each grower connected to the project, the report contains detailed, finalized grower input and output by crop year.

How do I export the Comprehensive Data Output File for my project?

Step 1. Login to the Fieldprint Platform. Find your project under the section Fieldprint Projects and click on the View icon

Fieldprint Projects

As the cornerstone of Field to Market's Supply Chain Sustainability Program, Fieldprint Projects harness the power of the common measurement framework offered by the Fieldprint Platform in order to identify and promote continuous improvement, while also increasing the visibility of brands and retailers into the sustainability performance of their complex commodity supply chains. Fieldprint Projects are classified based on how the aggregate data is used:

Supply Chain Project: Farmers document and demonstrate continuous improvement to be shared with downstream customers (e.g. supplier, manufacturer or retailer).

Demonstration Project: Farmers document and demonstrate the impacts of different management practices and share that research with the broader industry in aggregate to advance innovation.

Project	Sponsor	Project Type	Crops Analyzed	Actions
...	View
...	View
...	View
...	View
...	View
...	View
...	View
...	View
...	View
...	View

Step 2. Click on Reporting on the top right

Reporting

Fieldprint Project Admin Dashboard > [Project Name]

View Quick Facts

Organization	Organization Role	Representative	Representative Role
Field to Market		FTM Project Admin FTM Project Admin	Project Administrator
...	Project Sponsor	...	Project Specialist
...	Project Sponsor	...	Project Administrator
...	Project Sponsor	-	-

Project Benchmarks

A Project Benchmark is a value for each metric calculated based on the current performance of fields and growers enrolled in a Fieldprint Project. Project Benchmarks should be used with growers in the Project as comparison points to evaluate how their scores relate to those of other growers in the same Project. Project Benchmarks are crop and project specific and calculated separately for both irrigated and non-irrigated production. A Project must have a minimum of ten farmer participants before Project Benchmarks are calculated. Project Benchmarks are calculated on a running or cumulative basis starting in Year 1 and with a maximum of a five-year average (using the most recent years). Note that a Project Benchmark cannot be calculated for Soil Carbon.

No Project Benchmarks are currently available for this project.

Project Stats

Note that these totals can change as farmers associate and dissociate fields from the project. Provisional data is included in this table.

Copy to Clipboard

Year	Crop	Total Unique Farmers	Total Unique Farms	Total Unique Fields	Total Entered Acres (all fields)	Total Managed Acres (all farms)	Total Enrolled Acres*
2021

Step 3. Select Comprehensive Data Output File for the Crops and Years of interest and click on Request Report at the bottom

The screenshot shows the 'Fieldprint Platform' interface. On the left is a sidebar with navigation links: Dashboard, Field Library, Add Farm, Crop Rotation Library, Fieldprint Projects (selected), Support, and Collapse Panel. The main content area is titled 'Reports' and includes a 'View Quick Facts' button. A note states: 'Note that crop years with provisional status and crop years for which Fieldprint Results have not been computed are excluded from reports.' Below this, a dropdown menu is set to 'Comprehensive Data Output File'. The 'Filters' section includes 'Crops: Select one or more crops.' with a checked box for 'Winter wheat', and 'Years: Select one or more years available based on crop years associated with project.' with checked boxes for '2016' and '2017'. There is an unchecked checkbox for 'Include Grower Info in output'. A 'Request Report' button is at the bottom. A small text block explains: 'Once your request is submitted, the system will queue the report. When processing is complete, the system will generate an email with a download link. This can take from several minutes to more than an hour, depending on the number of fields, crops and years and required computation time.'

Step 4. Click OK. The request was submitted, and a download link will be sent to the email on file

This screenshot shows the same 'Reports' page as in Step 3, but with a confirmation dialog box overlaid in the center. The dialog box has a blue header with an exclamation mark icon and the title 'Fieldprint Project Report Request'. The body text reads: 'Your Fieldprint Project report is being submitted to the queue. When ready, an email with a link to download the report in Microsoft Excel format will be sent. This can take up to an hour, depending on the number of crop years included. Please check your spam folder if you do not receive the email.' At the bottom of the dialog is an 'Ok' button. The background page is dimmed, showing the same sidebar and report configuration as before.

QA Tool details

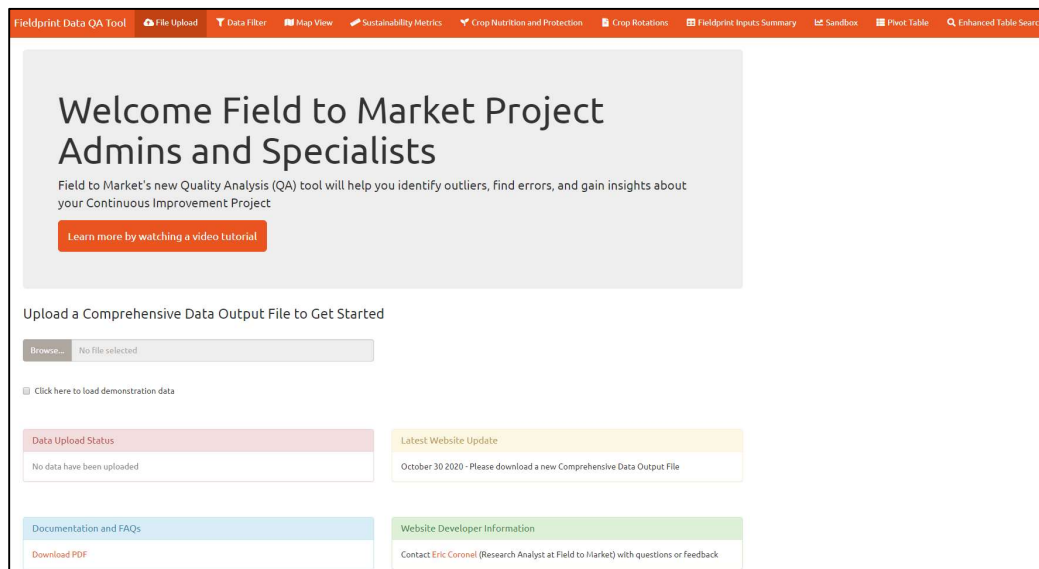
What is the QA Tool?

The Fieldprint Platform Data QA Tool is a stand-alone interactive website. A user needs to upload the Comprehensive Data Output Report to the website and content is automatically generated to explore the project data. The administrator would then be able to explore the location and boundary for each field, the Fieldprint scores for each metric, the amount of fertilizers and number of crop protectants applied, the operations within crop rotation templates, and summary tables for items such as crop yield.

The tool provides scatter plots and boxplots that allow users to compare results for all fields and crop years. These simple graphs are effective for quick detection of outliers. Outliers are data points that fall outside the regular pattern and might indicate an error in data entry. There is also an option to create customized scatter plots and pivot tables to explore the data in a personalized manner.

The structure of the QA Tool is as follows:

Landing page with file upload input, documentation, and contact information. Click Browse to select the Comprehensive Data Output File from your local storage



Data filter to temporarily include or filter out entire years, crops, or individual fields to focus on the data of interest

Fieldprint Data QA Tool | File Upload | **Data Filter** | Map View | Sustainability Metrics | Crop Nutrition and Protection | Crop Rotations | Fieldprint Inputs Summary | Sandbox | Pivot Table | Enhanced Table Search

Return here at any time to include or filter out data by Crop, Crop Year, and/or Field Name. The Field Name shown here is a combination of Crop Year, Grower ID, and Field Name to avoid issues with duplication. By default, all project data are included from the start. When Crops and/or Crop Years are included or filtered out, the list of Field Names and the table with Crop Year counts will update accordingly. The website will fail if all items for Crop, Crop Year, or Field Name are filtered out. The data filtering only applies to the current website session and it does not modify the uploaded Comprehensive Data Output File.

Count of Crop Years by Crop and Season

Crop	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Corn (grain)	5	11	5	13	7	12	10	11	15	5
Cotton	23	18	22	22	34	29	20	27	10	11
Wheat (winter)	4	7	7	6	2	4	4	1	2	NA

Deselect Crop(s) to Filter Out
☒ Corn (grain)
☒ Cotton
☒ Wheat (winter)

Deselect Crop Year(s) to Filter Out
☒ 2010
☒ 2011
☒ 2012
☒ 2013
☒ 2014
☒ 2015
☒ 2016
☒ 2017
☒ 2018
☒ 2019

Deselect Field(s) to Filter Out
☒ 2010.293 Delacruz
☒ 2010.293 Oneil
☒ 2010.293 Valencia
☒ 2010.293 Vinson
☒ 2010.294 Cash
☒ 2010.295 Goff
☒ 2010.295 Workman
☒ 2010.296 Holcomb
☒ 2010.296 Lee
☒ 2010.296 Nieves
☒ 2010.298 Kaufman
☒ 2010.298 Macias
☒ 2010.298 Talley
☒ 2010.303 Bright
☒ 2010.303 Compton
☒ 2010.303 Wynn
☒ 2010.304 Sosa
☒ 2010.306 Delaney
☒ 2010.306 McLeod
☒ 2010.307 Conrad
☒ 2010.307 Hahn
☒ 2010.309 Rutledge
☒ 2010.310 Sargent

Map view to visualize field locations and boundaries. Please do not print or share maps with visible field names.

Fieldprint Data QA Tool | File Upload | Data Filter | **Map View** | Sustainability Metrics | Crop Nutrition and Protection | Crop Rotations | Fieldprint Inputs Summary | Sandbox | Pivot Table | Enhanced Table Search

Use this map to check field locations and boundaries to identify if any errors were made in the field delineation step. You can zoom in and out to see reference roads and other landmarks. The Download button located below the map will save an image of the current map view. Clicking the checkbox will make field names visible. You can also see field names by hovering your mouse pointer over a field. There are several basemaps available; explore the options to find the most appropriate basemap for your needs.

Select Crop Year(s)
 2010
 2011
 2012
 2013
 2014

Select Crop(s)
 Corn (grain)
 Cotton
 Wheat (winter)

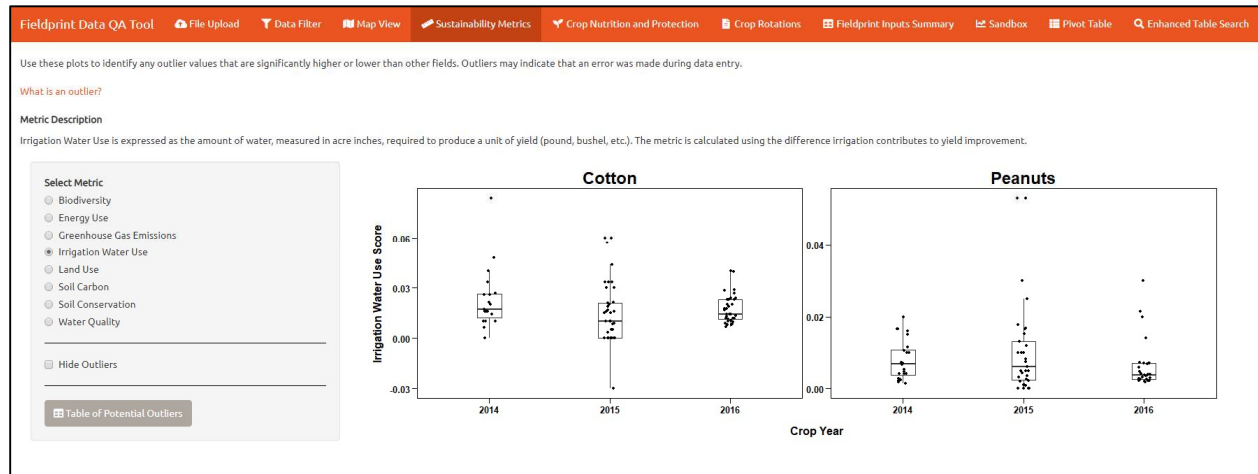
Plot
☐ Boundaries
☒ Centroids
☐ Show Field Names

Select Basemap
 OpenStreetMap

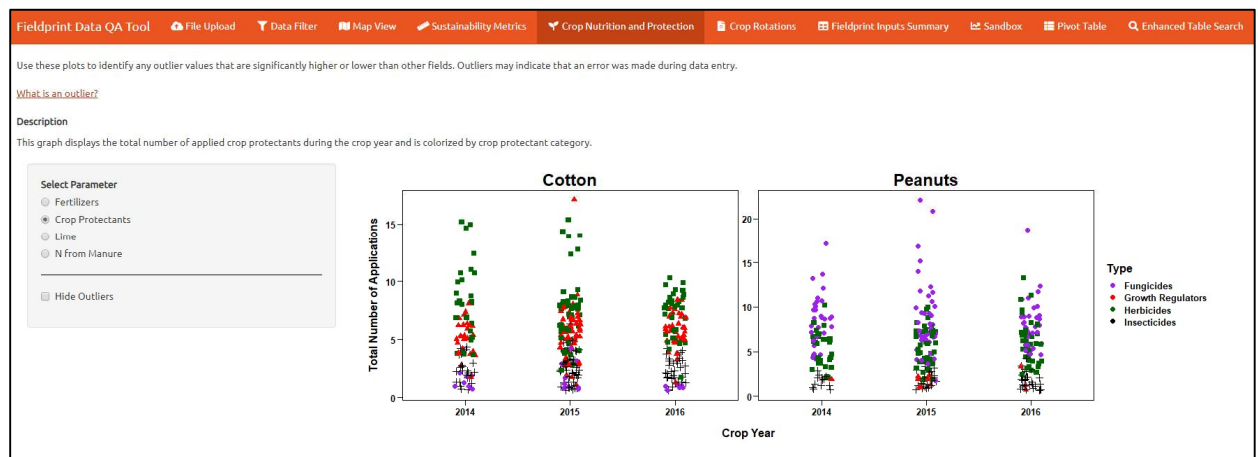
Select Fill Color
 Blue

Download

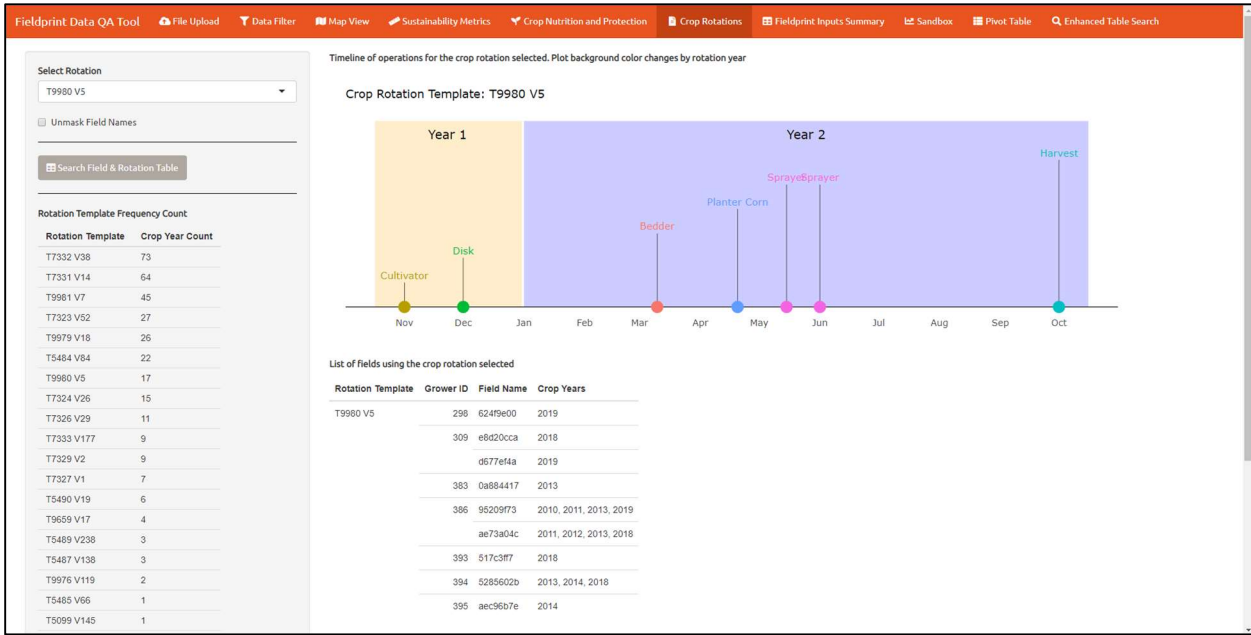
Scatter plots and boxplots to visualize sustainability metric scores. Clicking Table of Potential Outliers on the bottom left will open a popup table with suspected scores.



Scatter plots and boxplots to visualize fertilizers and crop protectants. Move through the various options to spot outliers for a given crop or year.



Visualize timeline of rotation operations in graph and table form, see rotation template frequency count, and find which crop years used each rotation



Find project-wide summaries for yield, fertilizers, crop protectants, field cropping history, and grower participation through the years

Fieldprint Data QA Tool | File Upload | Data Filter | Map View | Sustainability Metrics | Crop Nutrition and Protection | Crop Rotations | Fieldprint Inputs Summary | Sandbox | Pivot Table | Enhanced Table Search

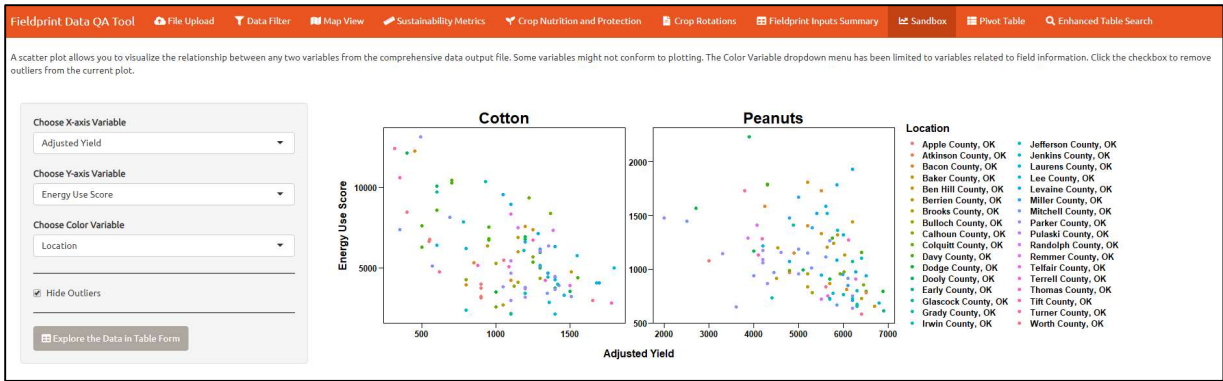
Select Summary Table
Yield

These tables summarize the average input values by crop and year for the comprehensive data output file and are provided for use in quality analysis of data entry.

This is a table of average yield by crop and crop year.

Crop Year	Crop	Yield	Number of Fields
2010	Corn (grain)	222.8	5
2010	Cotton	1496.7	23
2010	Wheat (winter)	56.4	4
2011	Corn (grain)	202.0	11
2011	Cotton	1313.4	18
2011	Wheat (winter)	61.4	7
2012	Corn (grain)	231.0	5
2012	Cotton	1202.9	22
2012	Wheat (winter)	34.5	7
2013	Corn (grain)	206.7	13
2013	Cotton	1268.8	22
2013	Wheat (winter)	43.4	6
2014	Corn (grain)	69.4	7
2014	Cotton	818.7	34
2014	Wheat (winter)	51.0	2
2015	Corn (grain)	150.1	12
2015	Cotton	1038.6	29
2015	Wheat (winter)	37.4	4
2016	Corn (grain)	209.8	10
2016	Cotton	1585.9	20

Create customized scatter plots of any two variables



Create customized summaries with interactive pivot table

Fieldprint Data QA Tool

Here you can create a pivot table of your choice. All variables from the comprehensive data output file are available to you. Drag items from the leftmost list to the row grouping section (the middle section) or column grouping section (right above the output table) as desired. Above the row grouping section there are two dropdown menus. The top dropdown menu displays various summary functions, such as Count, Sum, Average, Maximums, etc. Below the function menu you can select a variable to summarize.

Table: ▼

Yield: Average ↕ ↔

Crop: ▼

Row Grouping:

- Grower ID
- Farm ID
- Farm Name
- Field Name
- Field Size (acres)
- Location
- State
- Field Geo:JSON
- Yield
- Yield Units
- Land Use Score (acre / yield units)
- Soil Conservation Score (ton / acre / year)
- Water Erosion (ton / acre / year)
- Wind Erosion (ton / acre / year)
- Soil Carbon
- Irrigation Water Use Score
- Irrigation Water Use Score Units
- Energy Use Score
- Energy Use Score Units
- Management Energy (btu / yield units)
- Application Energy (btu / yield units)

Column Grouping:

Crop

Crop Year	Corn (grain)	Cotton	Wheat (winter)	Totals
2010	222.00	1,496.75	56.42	1,117.66
2011	201.95	1,313.38	61.36	730.33
2012	231.00	1,202.91	34.53	619.43
2013	206.68	1,268.77	43.40	752.89
2014	69.44	816.74	51.00	661.06
2015	150.08	1,036.55	37.40	712.84
2016	209.83	1,565.94	27.57	967.87
2017	203.81	1,156.93	23.79	689.06
2018	183.55	1,266.40	62.30	554.14
2019	170.85	1,356.91		967.84
Totals	185.24	1,205.49	45.87	805.38

Interactive table filtering and sorting to visualize raw project data

Fieldprint Data QA Tool

Here you can search the raw comprehensive data output file with enhanced filtering and column selection in groups. Choose the group of columns that are of interest to you from the dropdown menu below. You can add text searches above each column to find fields or targeted inputs.

Select Group of Variables: Field Information

Show 5 entries

Search:

	Grower ID	Field Name	Field Size (acres)	Location	State	Crop Year	Crop
1	383	Cote	61.2	Floyd County, TX	TX	2019	Cotton
2	399	Reilly	45.7	Crosby County, TX	TX	2019	Cotton
3	303	Compton	45.2	Floyd County, TX	TX	2019	Cotton
4	383	Raymond	61.4	Floyd County, TX	TX	2019	Cotton
5	298	Mooney	30.7	Floyd County, TX	TX	2019	Corn (grain)

Showing 1 to 5 of 347 entries

Previous 1 2 3 4 5 ... 70 Next

Frequently Asked Questions

What are appropriate uses of the QA Tool?

- Identify outliers
- Find errors
- Gain insights for internal uses within your organization, such as presentations, reports, and storytelling

What uses of the QA Tool would require approval?

Data insights cannot be used for claims without prior approval from Field to Market (more information about claims further down).

What are the most common data quality issues?

- Excessive N-P-K inputs, along with large N from manure values
- Mistaking fertilizer units of lb/acre and gal/acre
- Expressing lime application rates in units of lb/acre instead of short ton/acre
- Incomplete crop rotations

How do I assess and correct data quality issues?

If a user suspects that there is an error for a crop year input, for example if the total nitrogen applied to a field is twice as much as any other crop year in the project, the project administrator or specialist could go back to the source to verify the data entry and make any necessary corrections. Not all outliers or suspected errors will be incorrect data, but they represent an input that should be checked. If any corrections in the Platform are made, the Fieldprint metrics need to be recalculated for that crop year, and a new Comprehensive Data Output Report needs to be exported. It should not be assumed that checking project data via the QA Tool will result in clearing the project data as accurate, nor that the QA Tool will be able to identify all errors.

Are project administrators or specialists required to use the QA Tool?

There is no requirement to use the QA Tool. However, an important role of the project administrator or specialist is to ensure that growers are entering accurate data into the Fieldprint Platform. Visualizations and tables like those shown by the QA Tool could be created with Microsoft Excel, Python, R, SAS, Tableau, and many other analysis and visualization tools. This tool is also not designed to replace other quality assurance mechanisms that projects may use at various points within the project lifecycle.

Is the QA Tool synchronized with the Fieldprint Platform?

The QA Tool is a stand-alone website and not synchronized with the Fieldprint Platform; it has been developed to explore the data from a Comprehensive Data Output Report exported from the Fieldprint Platform. When an error is found, the data entry needs to be corrected within the Fieldprint Platform, and metrics need to be recalculated. Then, the project administrator or specialist would have to generate a new Comprehensive Data Output Report.

Can the output and summaries given by the QA Tool be used for claims?

The purpose of the QA Tool is to conduct quality analysis of Fieldprint project data to find errors before the data are reported elsewhere. Insights could be extracted using the QA Tool for internal uses, such as presentations, reports, and storytelling, but the data cannot be used for claims without prior approval from Field to Market. If a project wishes to use insights gained from the QA Tool, please contact claims@fieldtomarket.org.

Does the QA Tool website store any data?

The website does not store any data uploaded by users. The Comprehensive Data Output Report is temporarily uploaded to the server while a user is actively interacting with the QA Tool; once the QA Tool website is closed the data are erased.

Are the features in the QA Tool going to be added into the Fieldprint Platform?

Field to Market has included several quality assurance features within the Fieldprint Platform Version 3.0. There are no immediate plans to integrate these additional QA Tool features into the Fieldprint Platform, but there may be opportunities to do so in the future once we learn more about how projects are using the QA Tool.

If our project data is collected and reported on through a QDMP, can we still utilize the QA Tool?

In its current release, the QA Tool has been designed to work only with the Comprehensive Data Output Report generated from the Fieldprint Calculator. Qualified Data Management Partners (QDMP) may offer the option to export project data in a similar format so exported data can be used in the QA Tool. In addition, Field to Market will make available on request to QDMPs the underlying source code of the QA Tool should they elect to build and deploy a version within their own systems.

Will any QA Tool functionality be made available to QDMP via the Fieldprint Platform API?

There are no current plans to offer QA Tool functionalities via the Fieldprint Platform API. However, the backend code for the QA Tool will be made available on request. The code for the QA Tool is written in [R](#), an open-source language, and the website is built using the [Shiny from RStudio](#) framework.

How can I give feedback, request features, or report errors in the QA Tool?

Please send feedback, error reports, or feature requests to Eric Coronel (ecoronel@fieldtomarket.org).