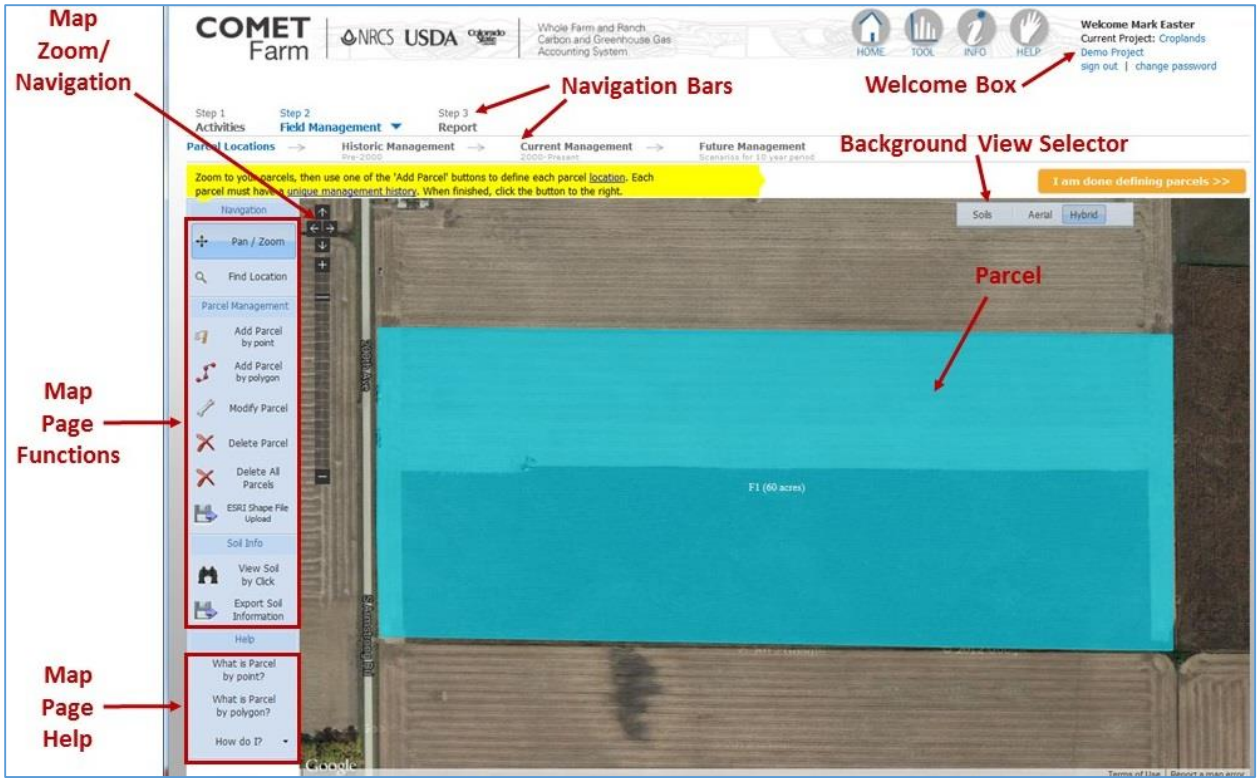
Getting Started with the Cropland Demonstration Project

How to use the Demonstration Projects-

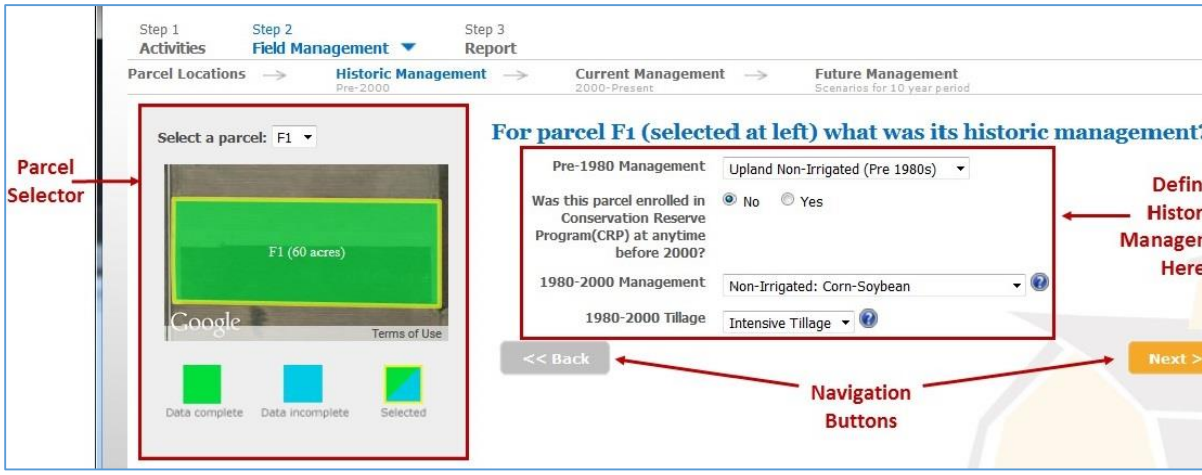
Each demo project has been selected to help users see how COMET-Farm works and how to navigate the data entry pages in a completed project. While navigating through a Demo Project, there are help windows providing information on the site or the management practices that have been selected.

Walkthrough a demo project

1. **Description of the Demonstration Project:** A variety of different crop management practices can lead to greenhouse gas emissions from growing crops. Heavy tillage with plows or listers breaks up soil structure and decomposes soil organic matter into carbon dioxide. Synthetic fertilizers like anhydrous ammonia and urea can lead to large nitrous oxide emissions. Wetland rice production leads to methane emissions from anaerobic soil conditions. Draining and farming organic (muck) soils leads to heavy decomposition and large carbon dioxide emissions. There are, however, a number of important conservation practices that can sequester (store) carbon as organic matter in soils and reduce these and other cropland emissions, improving the overall greenhouse gas balance of farming practices. This demonstration project describes two such practices – reducing tillage to sequester soil carbon, and improving nitrogen fertilizer management while using enhanced efficiency fertilizers to reduce nitrous oxide emissions. The practices described in this demonstration were selected to represent average management practices from the Des Moines lobe region in northwest Iowa. The field shown is on the Allee Demonstration Farm, operated by Iowa State University.
2. **Activities**
    a. Once the demo project has been selected, click on “Define Activities’” to continue to Parcel Locations.

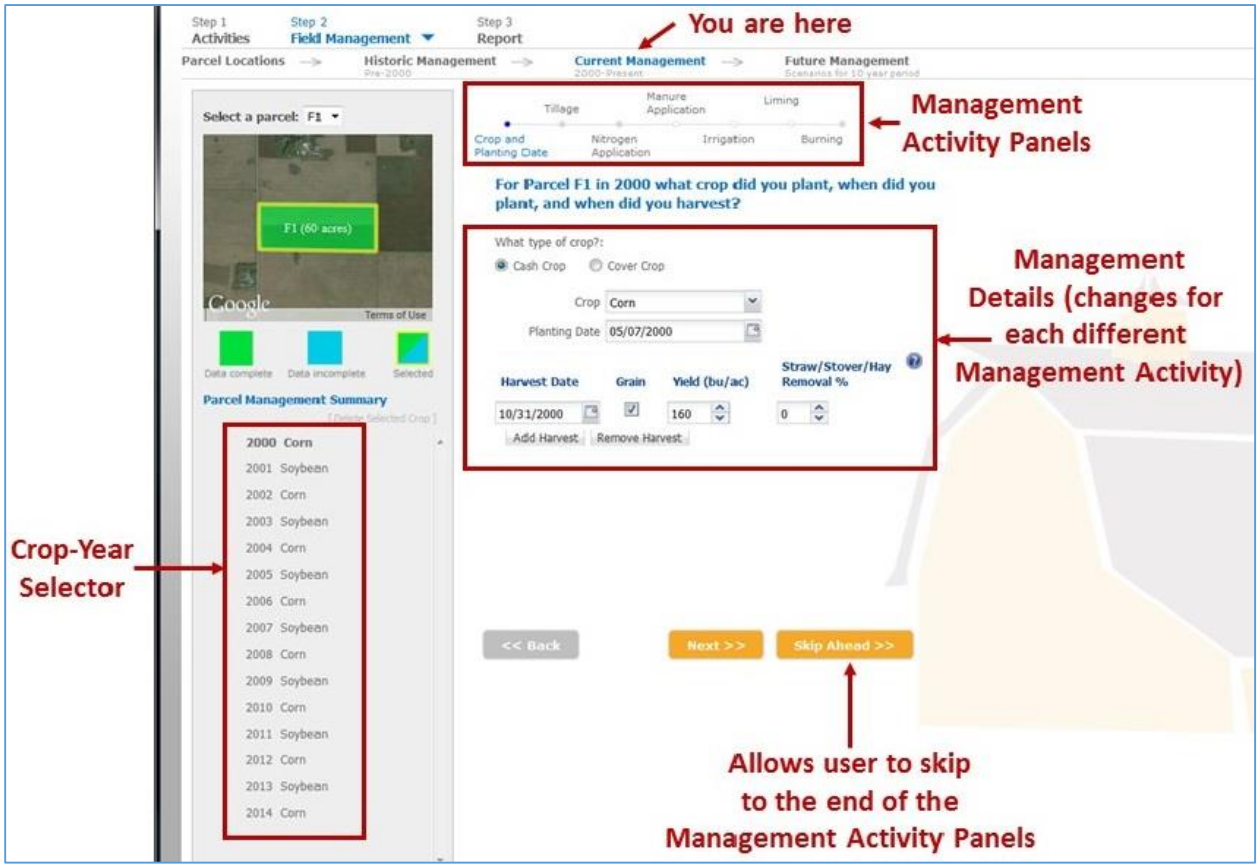


3. Parcel Locations
   a. The **Parcel location** for the demo project is located at the Allee Farm. The parcel that has been selected is a 60-acre field that is highlighted in blue.
   b. Soil information
      i. To turn on the soil layer click on the "Soils" button in the top right of the map. This will generate a soils map for the location.
      ii. Soil information can also be viewed by clicking on the "View Soil by Click" located in the tool bar to the left of the parcel map.
      iii. To download the soil information for the selected parcel, click on "Export Soil Information" to have the soil data exported to an excel file.



c. To continue to **Historic Management** click on the "I am done defining parcels" button in the top right above the map. Historic Management for this demonstration was defined based on regional management practices. Note the blue question marks that are found next to 1980-2000 management/tillage. They will provide explanation that help users select the best fitting options for their project.

d. To continue to **Current Management** click on the "Next" button located in the middle on the page on the right.



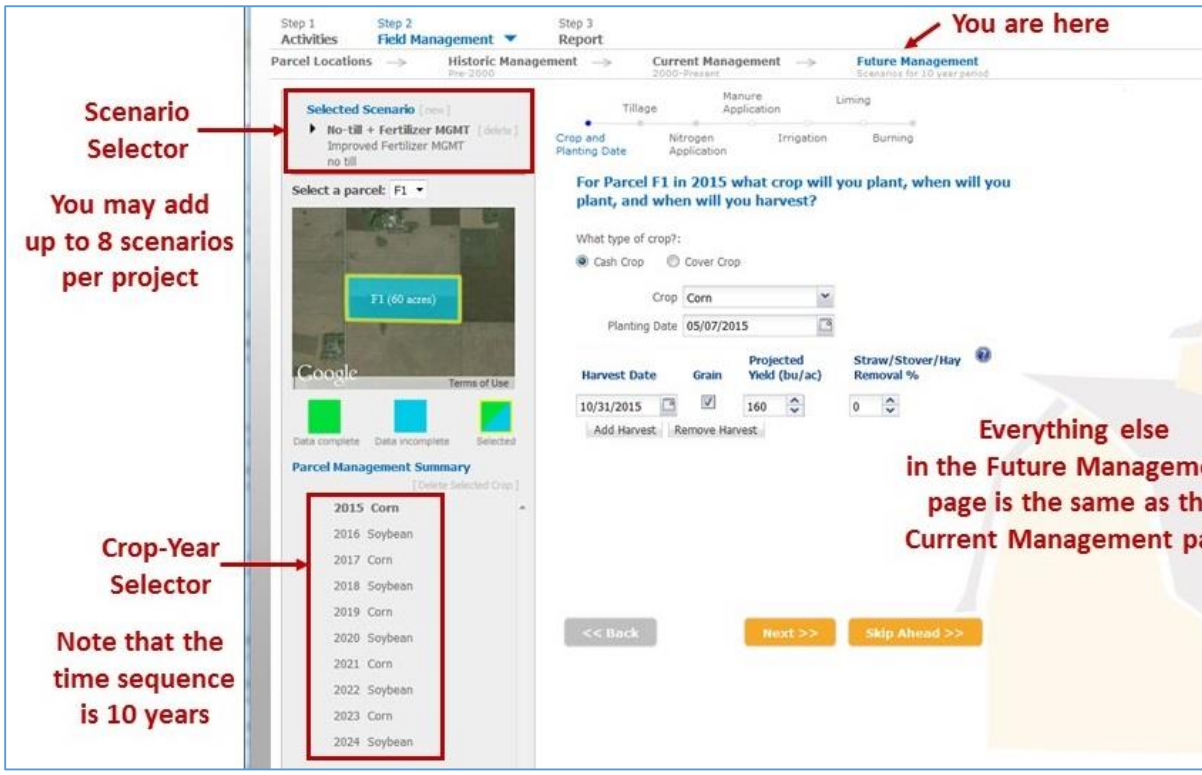
e. **Current Management** used in the demo project is explained in the "Demo- Current Management" window that appears when the Current Management page opens. After reading the current management description, click the "ok" button in the bottom right corner of the window.

   i. Note the selected management practices for this site. Management is defined for the years 2000 through the current year.
   ii. Clicking on "Next" at the bottom of the page will navigate the user through the remaining management practices; tillage, nitrogen and manure application, irrigation, liming and burning.
   iii. Once all the management practice have been selected for a year, a window appears offering the user the option to add an additional crop.

1. This option can be used to add a cover crop or add another cash crop if multiple crops are grown on the same parcel within the same year.
2. This option is also used for winter wheat or other crops whose growing season spans a calendar year. Click "Yes, add additional crop to the same year" to add the crop. This demo project does not have more than one crop in a single year, so there is no need to add additional crops to the current year. Click "No Thanks Continue" to continue to management information for the next year in the rotation.
3. At this point, the user's data entry is completed for this year. The "Copy Crop?" window will then appear, giving the user the opportunity to copy the crop and management information for the current year to subsequent years, and avoid having to re-enter the information. This is indicated by the red boxes under the year. If crop-years do not have data, there will not be a red box shown for that year. Simply check the years into which you wish to copy the current year's crop, or click on the "select" box to copy to all of the years.
4. The green check mark indicates the crop-year data that will be copied. This allows users to copy management practices to other years. This option can help save time on data entry.
5. Using the Cropland Demo click "No, thanks" to advance to **Future Management** without copying any crop data to other years in the sequence.

f. **Future Management** is explained in the "Demo- Future Management" window that appears when the Future Management page is opened. After reading the future management description, click the "ok" button in the bottom right corner of the window. This aspect of COMET-Farm allows users to see how changes in management practices can impact greenhouse gas emissions and carbon sequestration. The crop and management practices defined in the users "Current Management" is automatically used as the baseline that all future management scenarios are compared to. Additionally, the user can automatically copy the crops and management from the Current Management (or any future management scenario) to a new future management scenario, to use as the basis for a management change (such as changing only tillage, or changing only fertilizer management, etc.). Any of the management practices that have been defined in current management can be changed in the future scenario. For the Cropland Demo the future management scenario the same crop rotation was used, but with the conversion to a no-till system was applied for both crops.

i. When all management practices have been completed in Current Management and the user clicks on the "Next" button or on the "Future Management" navigation bar, the "Continue to future management" window will open. Users can click on the "Keep editing" button to return to current management to review or change management practices, or click on "Continue to Future Management" to navigate onto the future management page.



ii. While navigating through future management, clicking on the "next" button has the same functionality as it had in the current management portion of the tool, taking users through the management practices.

iii. Management practice options offered in future management are the same as in current management. Users may add up to 8 alternative management scenarios, changing various management practices to investigate how such changes impact greenhouse gas emissions and/or carbon sequestration. All future management practices have been entered for the demo project, so users need only click the "next" button located at the bottom of each the management practice to move onto the "Future Management Scenarios window."

iv. There are many options found in this window.

   1. Additional scenarios can be added by entering in a name, copying management information from one of the user's existing saved scenarios and then clicking "Create New Scenario".

2. Users can also click on "Keep editing" to modify or examine the future management scenario that was just completed.

v. For the purpose of the Demo project click on "Continue to Report" to see results/reports.

1. The time to generate a report for the demo project is typically less than 1 minute. However, for the user's own projects, depending on the amount of parcels and the complexity of the projects it may take several minutes to load the results. The user may navigate his or her browser away from the page as the information entered has been saved. The reports will be available to registered users when they return later to the tool and open the project, by clicking on the "Report" option in the navigation bar at the top of the page. Non-registered users can access the reports of demo projects but any changes to the projects will not be saved for future review and analysis.

4. Reports

a. The demo report presents information based on the bassline emissions from the current management practices, and compares them to the future scenarios described in the Future Management section of the tool. In this case, the demo project compares the baseline against changes in fertilizer management and tillage. Results are presented in a table format and in a graphical report. Both sets of data can be downloaded.

i. Table data can be downloaded by clicking on the "Export Crop Management Data" button below the table.

ii. Graphical data can be downloaded clicking the dropdown menu to the top right of the graph. Multiple file format options are provided.

❖ ***Features found on the Activities page***

- The icons provide information on the categories and what can be evaluated.
- At any time throughout the Demo, clicking on any of the buttons located in the top right of the window will take users directly to that page.

❖ ***Helpful tips***

- There are definitions of common questions on the right that provide users with information on selecting the activity that will best resemble their unique operation.