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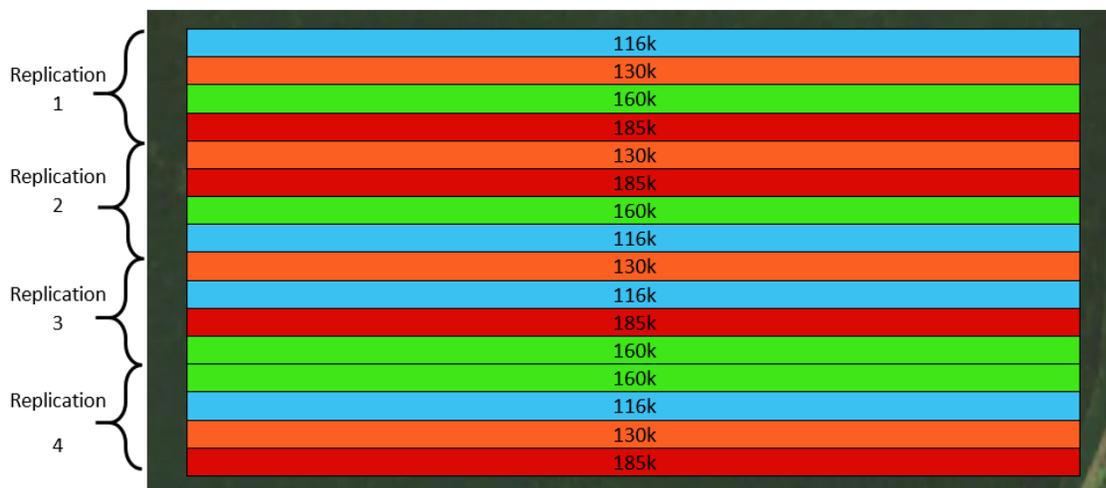
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*This tutorial uses AgLeader SMS software. The data for this tutorial is located in the folder entitled "Lesson 1 SMS Files". For instructions on loading this file into SMS, please go back and view the video "Loading the Tutorial Files into SMS". If you do not have SMS installed, please go back and view the videos "Downloading and Installing an SMS Demo" and "Getting Familiar with the SMS Interface".*

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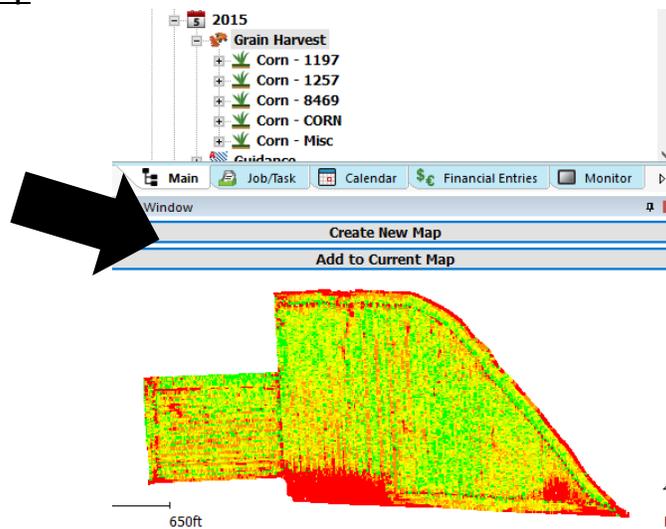
### Introduction and Data Layers

In this tutorial, we are setting up an on-farm research project to look at the impact of soybean seeding rate on soybean yield. The goal of this tutorial is to create a planting prescription to implement the plot trial below. In the next course we will learn how to analyze yield data from this population study. Grain harvest from 2015 is provided as a reference dataset. We will make the soybean seeding rate prescription for the 2016 growing season. The following is our randomized and replicated treatment design for the four seeding rates we will be examining.

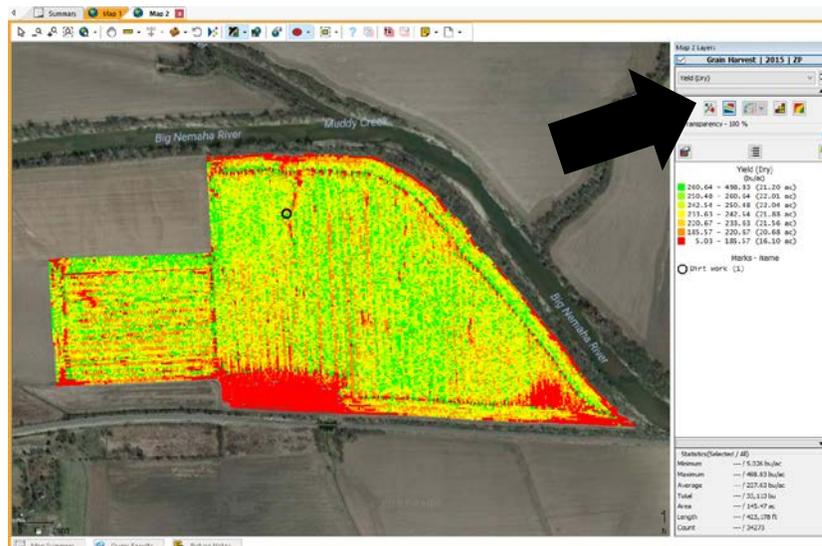


## Creating an On-Farm Research Seeding Rate Prescription

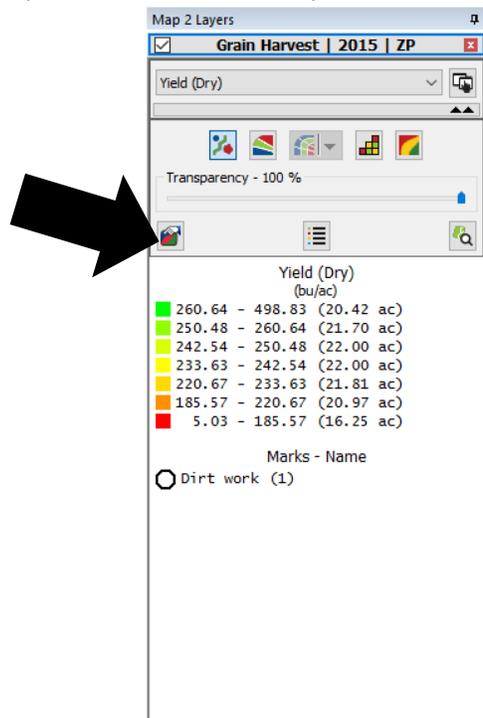
1. Open the project entitled **Setting Up an On-Farm Research Experiment**. In the management tree, click on the plus signs to expand options. You should see an operator – "PADMW\_Tutorial\_Grower", a farm – "ZFI", and a field – "ZP". Under "ZP" you will see we have data from 2015. Expand the data from 2015 by clicking on the plus sign. You should see "Grain Harvest" under 2015.
2. For this tutorial, we will use the 2015 grain harvest to plan our planting prescription. The goal is to align our prescription with the equipment travel direction for the field. Old A-B lines could also be used to align your treatments.
3. Click on **Grain Harvest** under 2015. You will see a preview of the data in the window below. Click **Create New Map** to view the data in the main window.



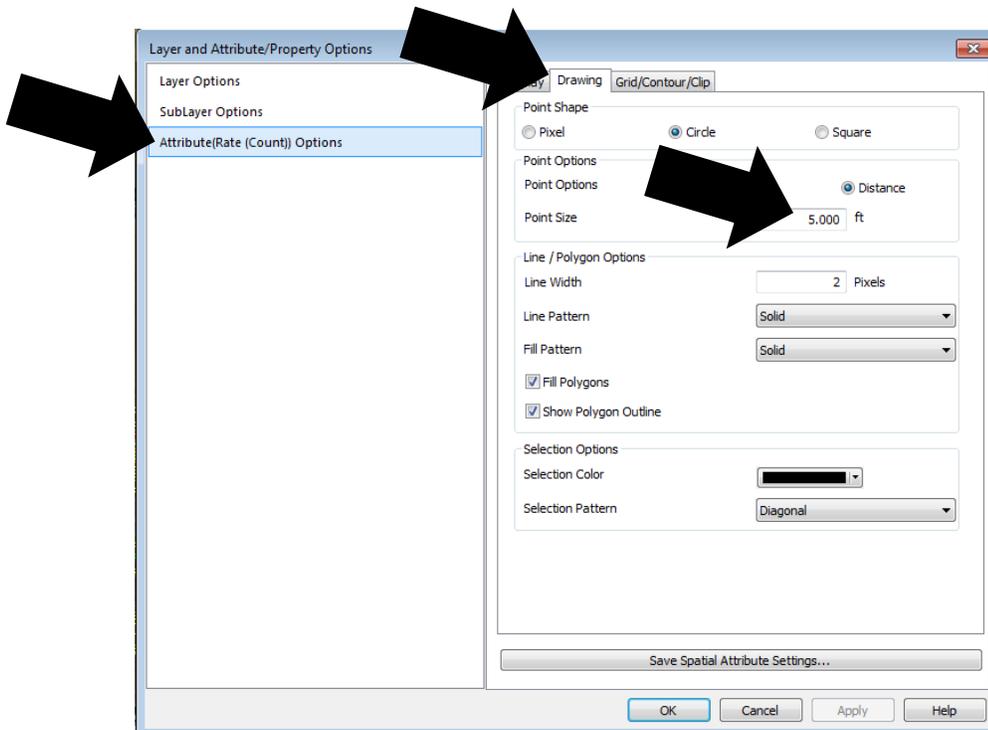
4. Take a moment to explore the data. The default view will be a swath map. Click the base map to view as points.



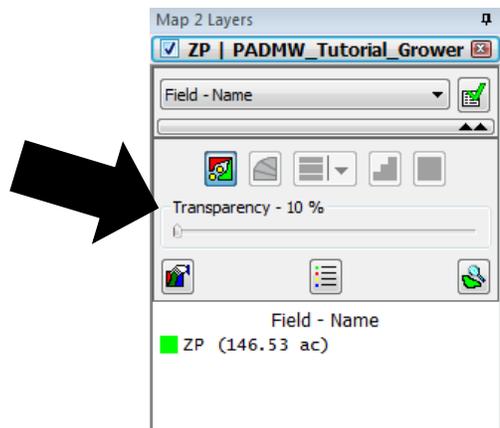
- Click on the edit layer options for the harvest layer.



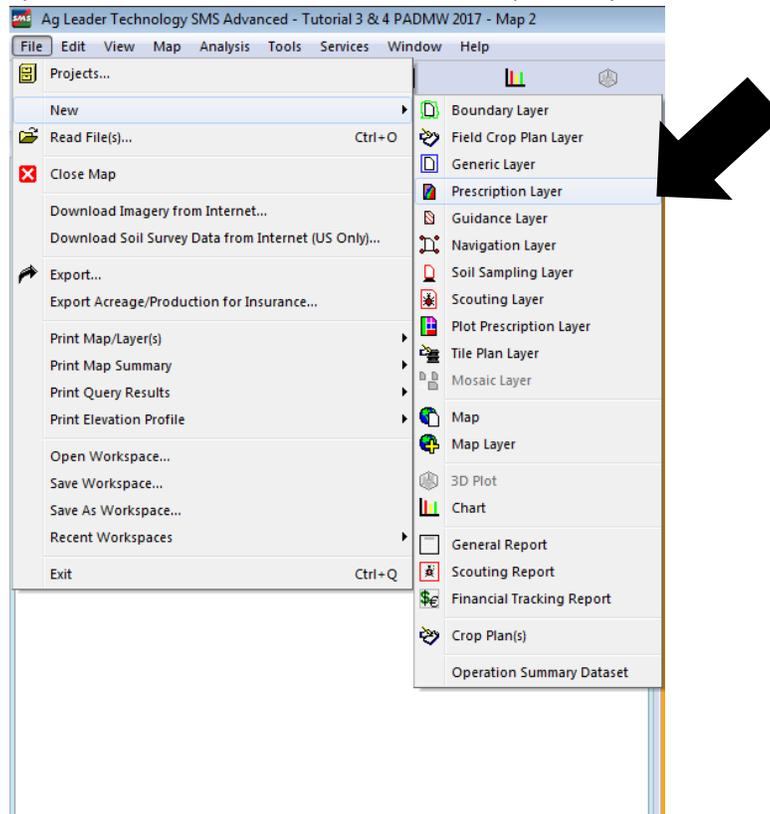
- On the left hand side select **Attribute (Yield (Dry)) Options**. Select the middle **Drawing** tab next. Find the line titled **Point Size** and change it to 5 feet.



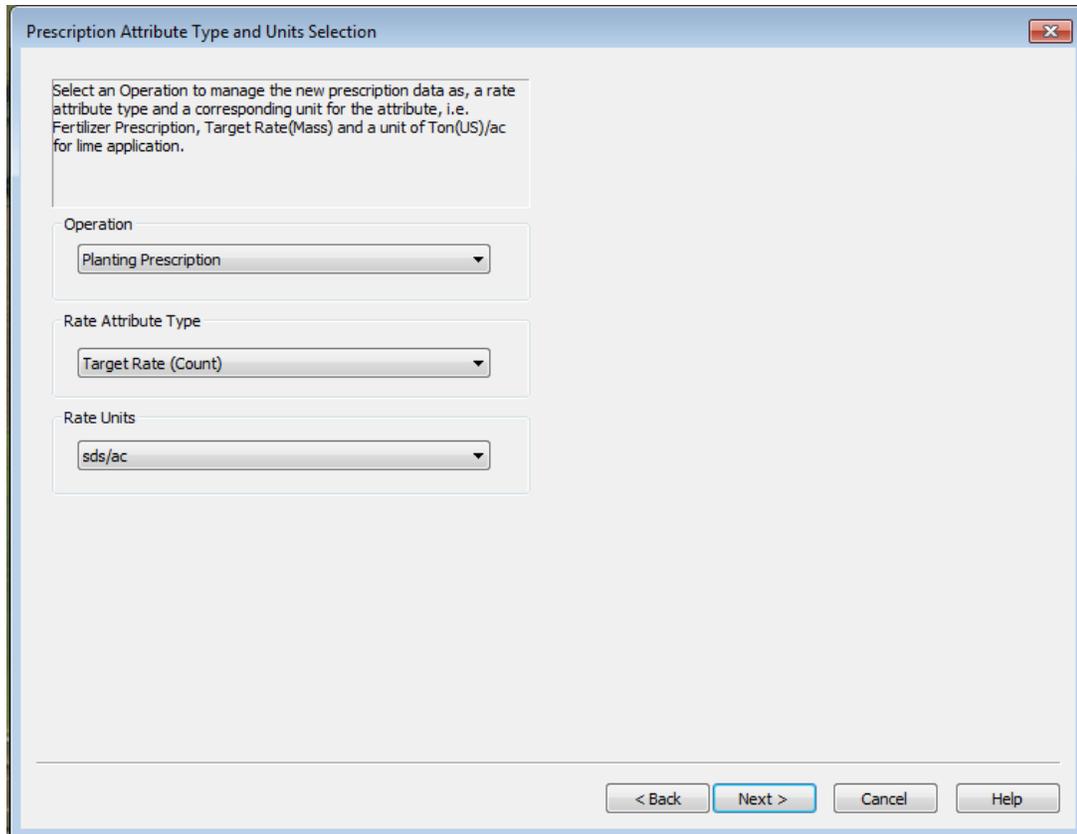
7. Select **OK**. Noticed the yield points are now much smaller. This will help us when we use the editing tools to create the prescription blocks.
8. Under the management tree, click on the field name **ZP**. You should see a green image of the field with a black outline in the preview window. Select **Add to Current Map**. This is our boundary layer. We need to use this boundary for creation of the prescription map.
9. Now that the boundary is on the map, we need to lower the transparency. This will allow us to see the yield file below when creating the prescription map. Drag the slider down to 10%.



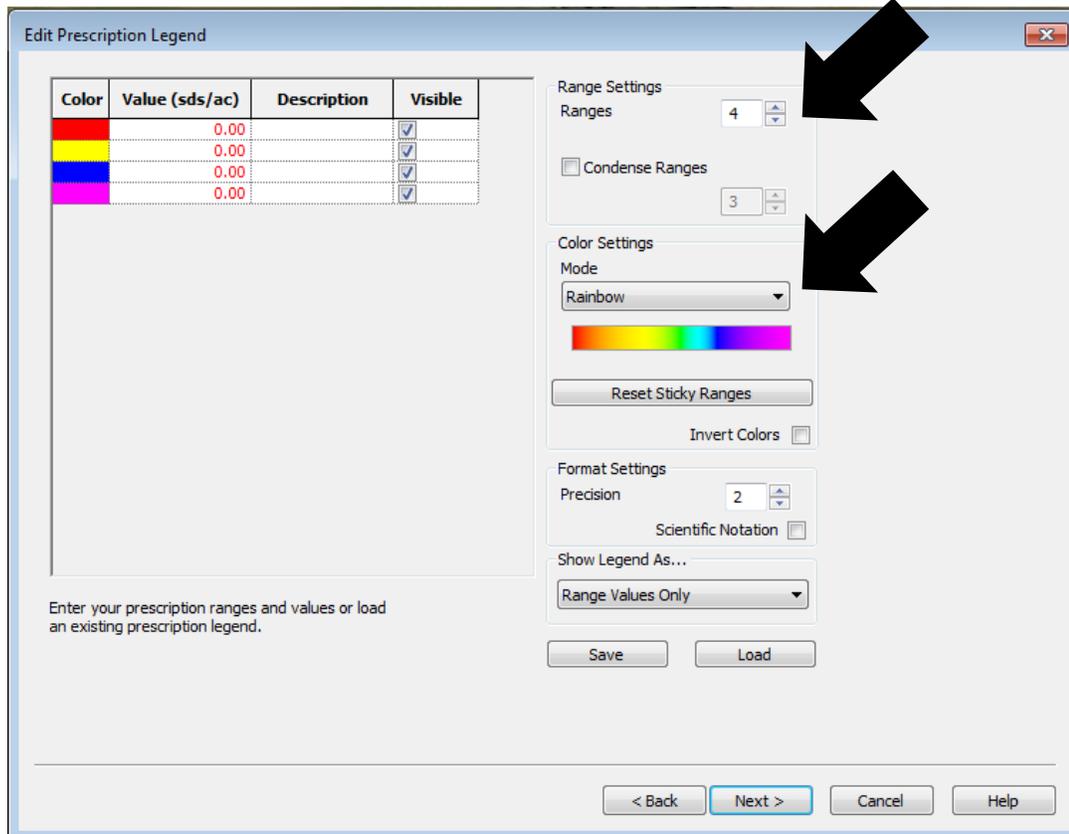
10. After the transparency is lowered, select File → New → Prescription Layer



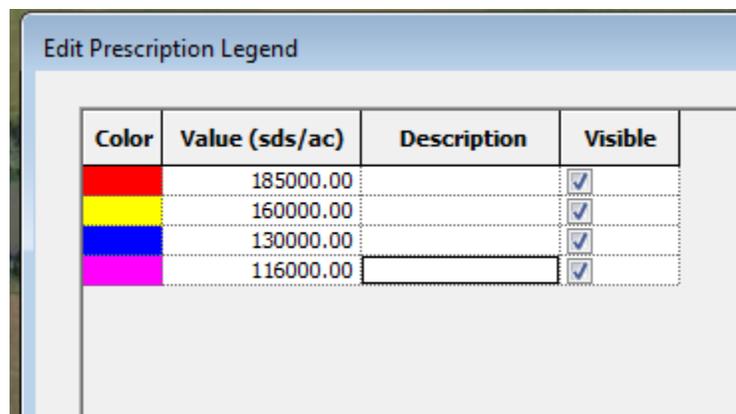
11. The **Prescription Reference Layer Selection** window will now open. Verify that the Reference Layer is 1-ZP | PADMW\_Tutorial\_Grower and select **Next >**.
12. In the next window, change the operation to **Planting Prescription**, the Rate Attribute Type to **Target Rate (Count)** and keep the Rate Units as **sds/ac**. Once these attributes are selected, click **Next >**.

A screenshot of a software dialog box titled "Prescription Attribute Type and Units Selection". The dialog box has a light blue header and a white body. At the top right of the header is a close button (X). Below the title bar, there is a text box containing the following text: "Select an Operation to manage the new prescription data as, a rate attribute type and a corresponding unit for the attribute, i.e. Fertilizer Prescription, Target Rate(Mass) and a unit of Ton(US)/ac for lime application." Below this text are three vertically stacked dropdown menus. The first is labeled "Operation" and has "Planting Prescription" selected. The second is labeled "Rate Attribute Type" and has "Target Rate (Count)" selected. The third is labeled "Rate Units" and has "sds/ac" selected. At the bottom of the dialog box, there are four buttons: "< Back", "Next >" (highlighted in blue), "Cancel", and "Help".

13. In the next window, the **Edit Prescription Legend** allows us to select how many treatments we will include as well as how they will be displayed. For this on-farm research study, we will select four ranges (since we have four seeding rate treatments) and change the color settings to Rainbow.

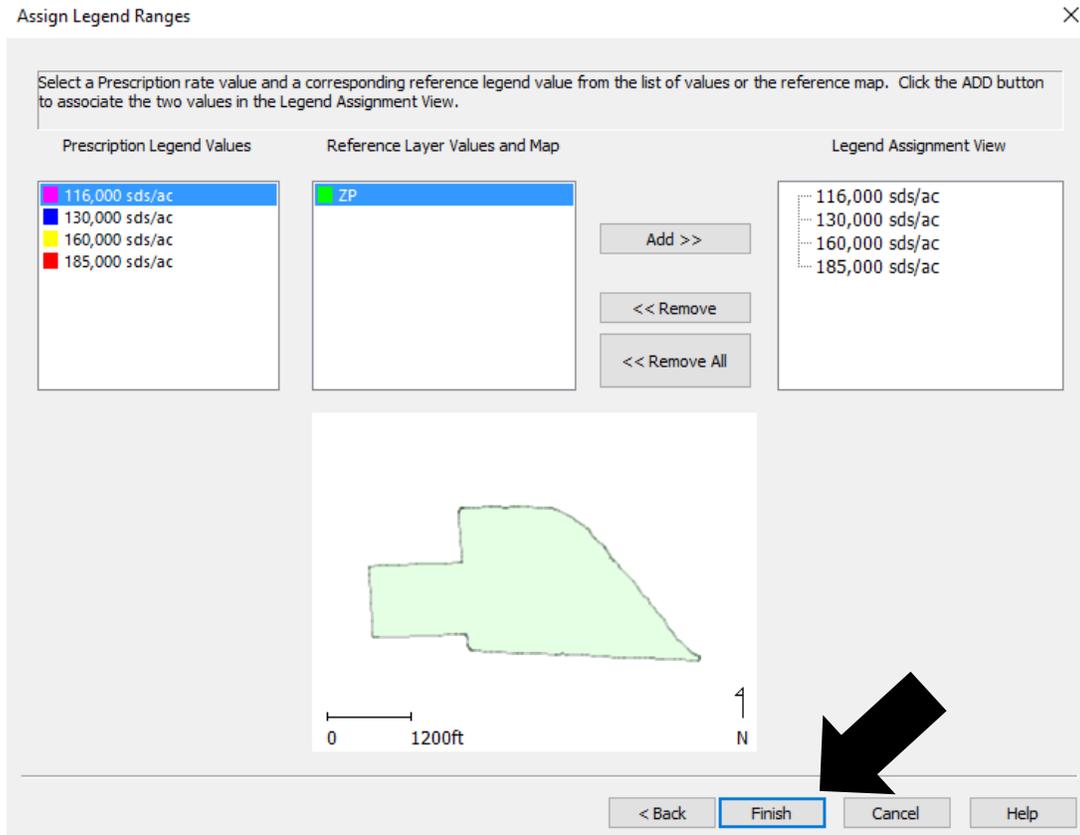


14. Now we will input the seeding rate values. Change the number in the **Value (sds/ac)** column to: 116,000, 130,000, 160,000 and 185,000.



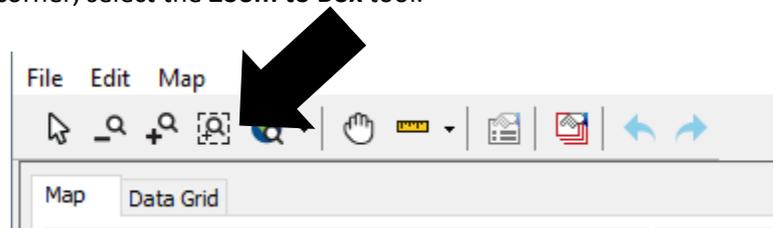
15. Select **Next>**.

16. The window should look like the example below. If everything looks ok, click **Finish**.



17. The Prescription Editor window will have now opened. We should see our field, it will be completely white. In the bottom left hand corner, we can change the transparency to see our planting points beneath. We suggest moving the transparency to somewhere around 20%. Seeing through to the planting layer is important so we can create blocks that are singular units of our header width or planter width. In this case, this field in 2015 was harvested with a 15 foot corn head. The soybean seeding rate study that we are setting up will be planted with a 30 foot planter. Therefore, we will make each research block equal one planter width, which is represented by two rows of harvest data points.

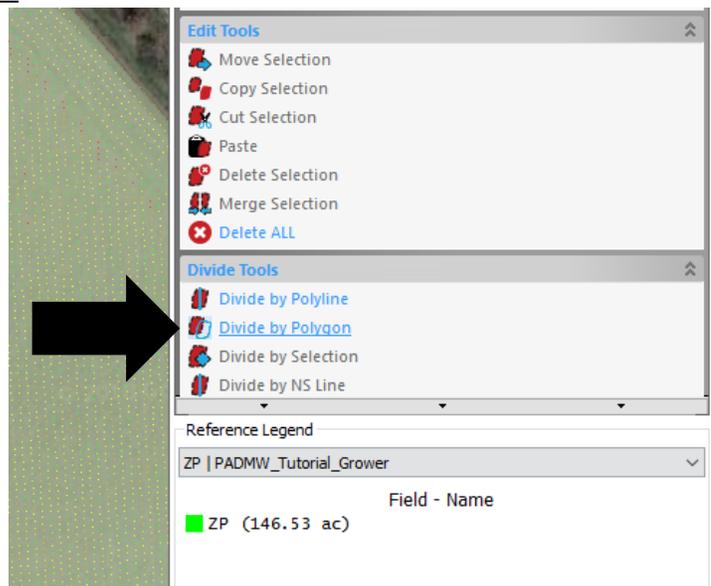
18. In the top left corner, select the **Zoom to Box** tool.



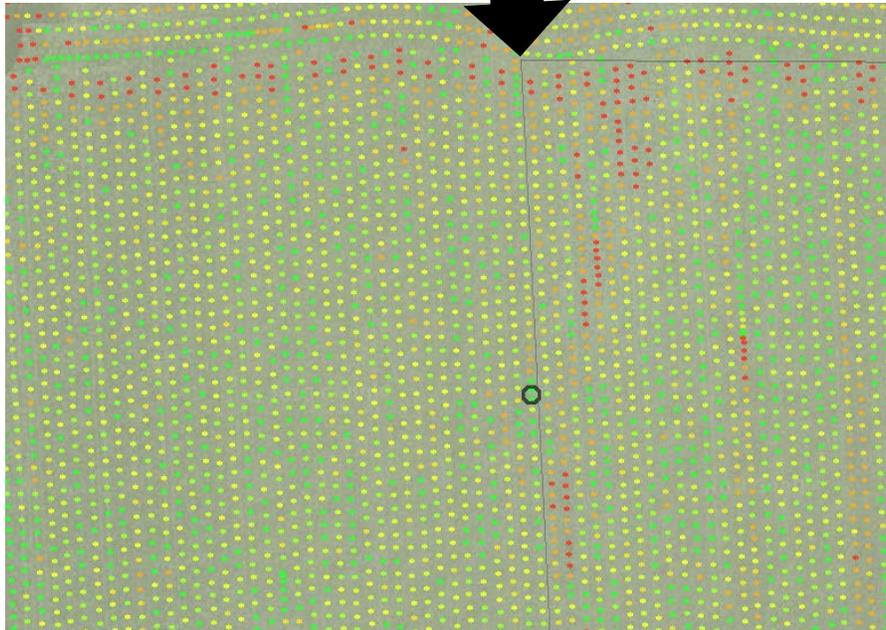
19. Using that tool, zoom to the area shown on the image below. We will start the west edge of the research plot 42 passes in from the west edge of the field.



20. We will now plot our block design. Under divide tools on the right side of the screen, select **Divide by Polygon**.

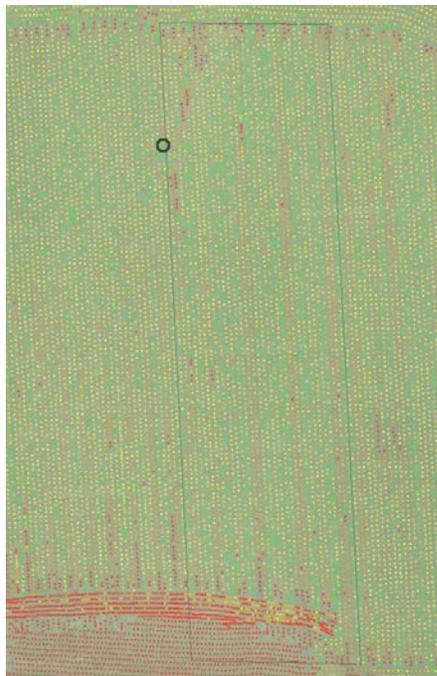


21. We will start the plot between the 42 and 43 harvest pass from the left. For reference, this pass is just to the right edge of the black circle marking dirt work.

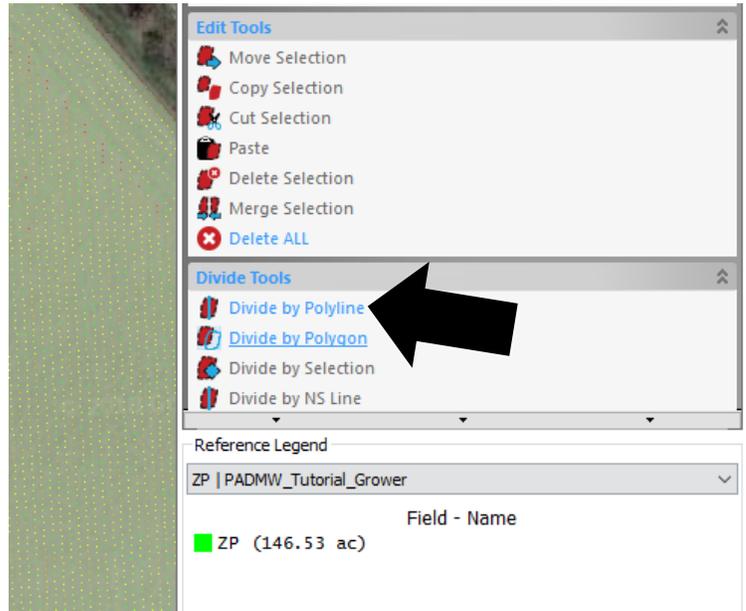


22. Use the polygon tool to click on each corner of the plot. The width of the plot will be 32 harvest passes wide. To finish off the rectangle, right click. Your finished polygon should look like the one below.

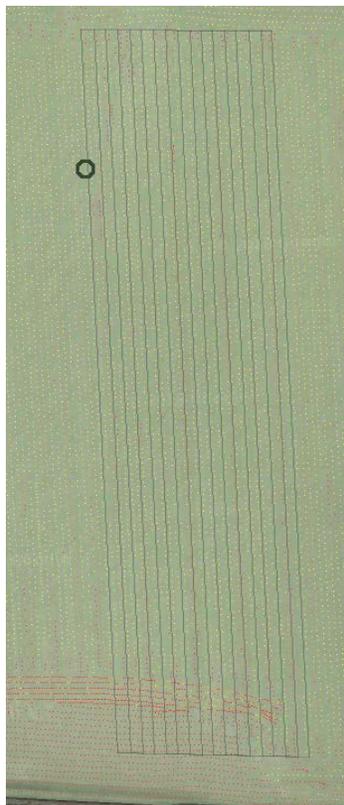
If your polygon does not extend as far to the south, that is fine.



23. Our next step is to divide our polygon into strips. We will do this using the **Divide by Polyline** feature on the right side of the editor screen. Click on **Divide by Polyline**.

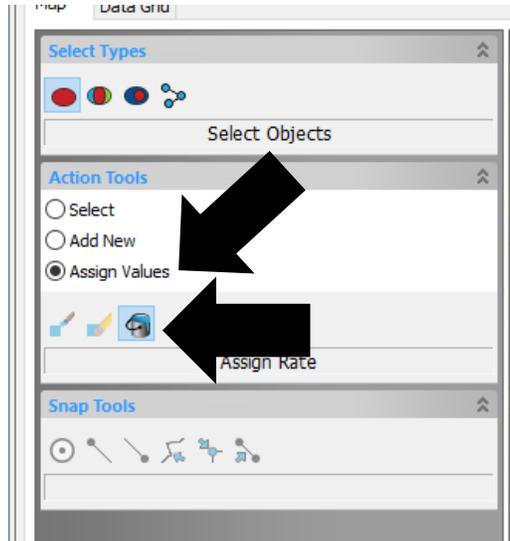


24. After every two harvest rows we will insert a line. Left click outside the box, between the desired rows, then run the line down the row, and right click, outside the box. This feature “snaps” the line to the polygon we previously created, making it easy to subdivide the box. See the following image to see what it should look like.



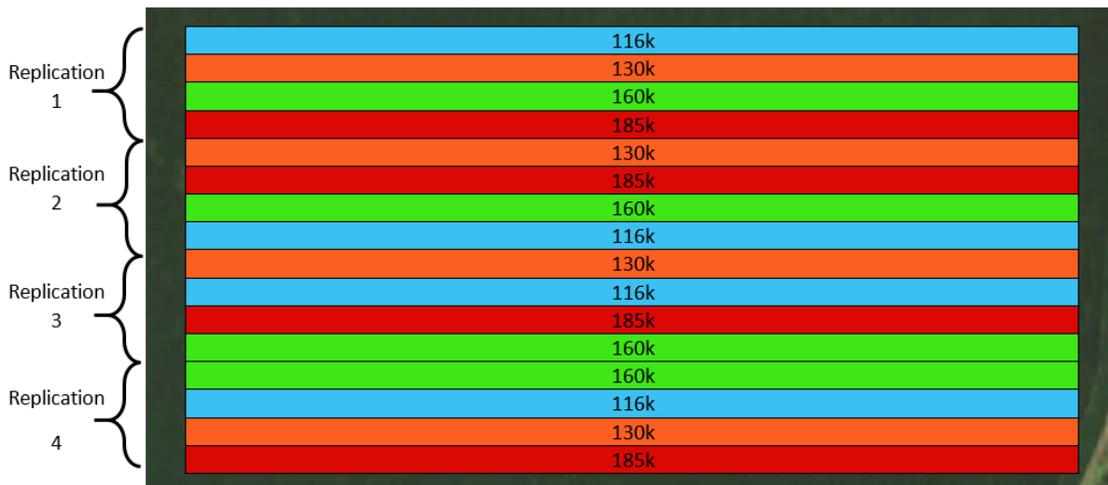
25. When finished you will have 16 strips.

26. Now we will assign the treatments to each block. On the left hand menu, make sure that **Assign Values** is selected under **Action Tools**. Click on the paint can beneath that.



27. Click on each rate and assign it to the polygon. Below is our treatment map plan. We will start with Rep 1 on the west (left) side. Click the paint can, then select the 116,000 rate below. Now click the paint can on the strips that should receive this rate. Continue until the whole plot is assigned. Use caution as the colors of the diagram below do not correspond with the colors SMS has generated for us.

Assign a rate of 160,000 sds/ac to the remainder of the field outside of the plot.

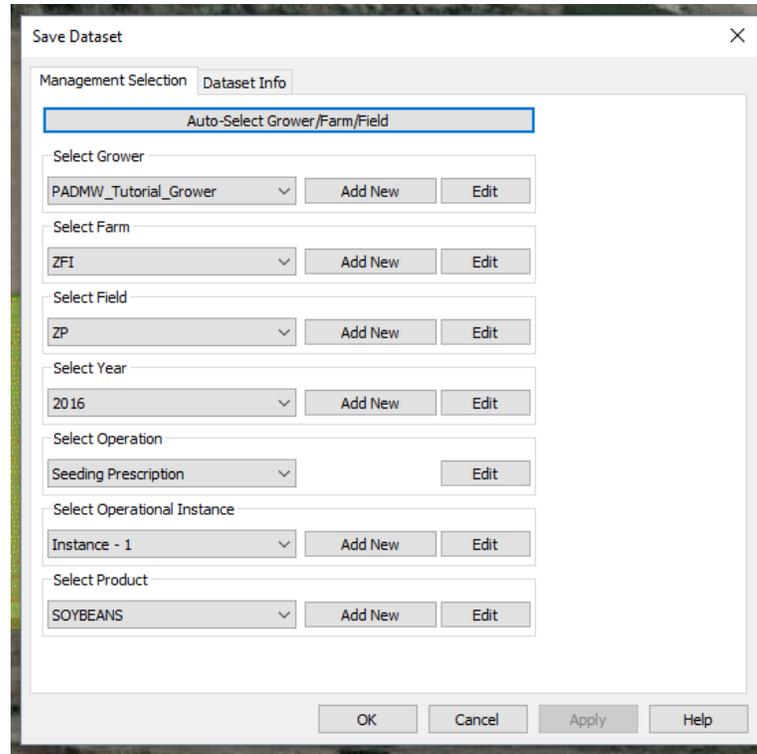


The map should look like this:



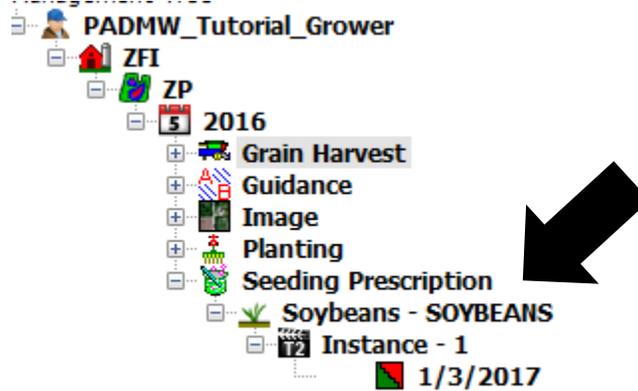
28. Click **Save** in the bottom left corner.

29. The **Save Dataset** window will open. Verify the grower, farm, and field. Put the planting prescription in year 2016 and leave as a seeding prescription and operational instance as 1. Select “SOYBEANS” as the product. Select **OK**.



30. Click **Close** at the bottom of the **Prescription Editor** window.

31. In the management window, you should see the seeding prescription you have just created.



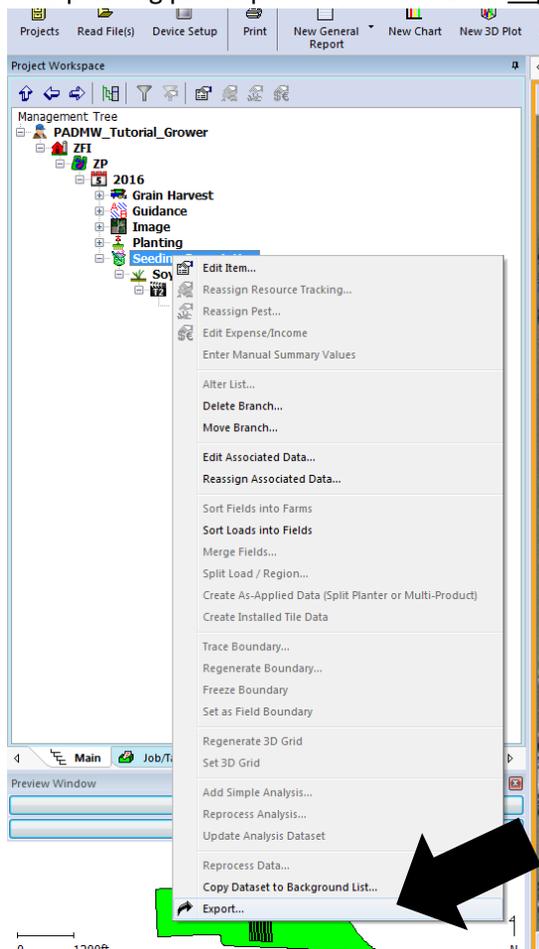
32. Click on the prescription and select **Create New Map**. Once it appears in the main viewing window, change the viewing attribute from **(All Attributes)** to **Target Rate (Count)**.

33. You should now see your prescription map.

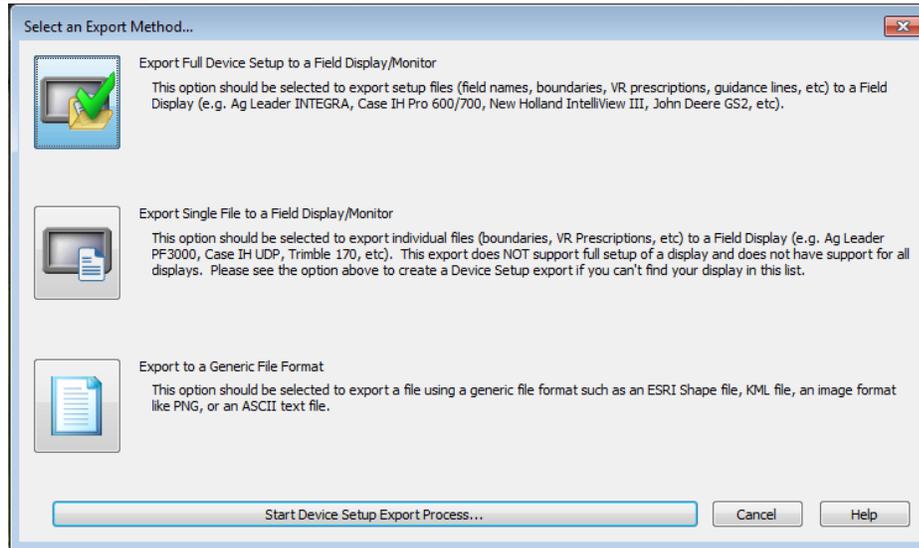


### Exporting Prescription Map to Selected File Format

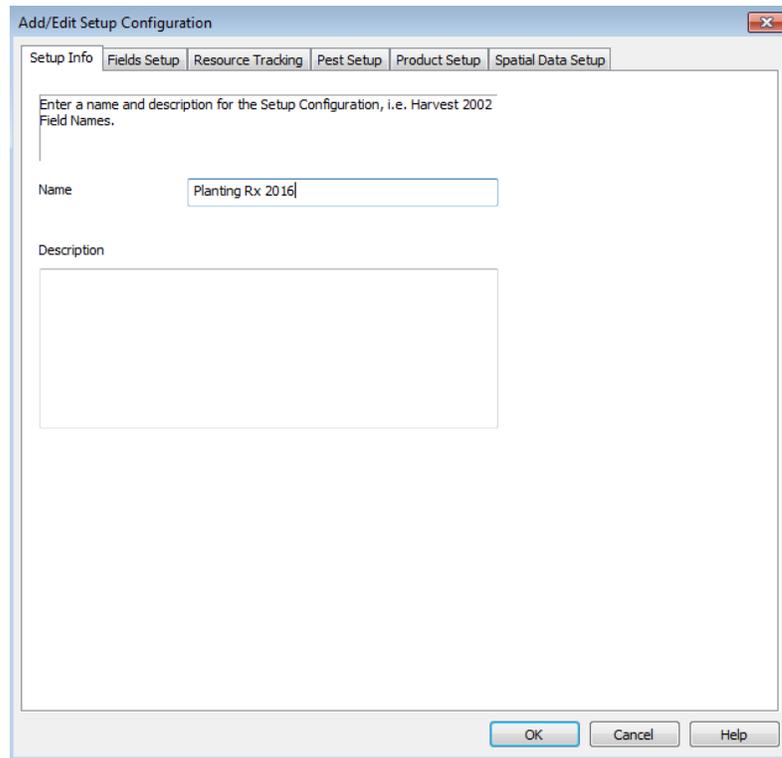
34. Right click on the name of the planting prescription and then select **Export**.



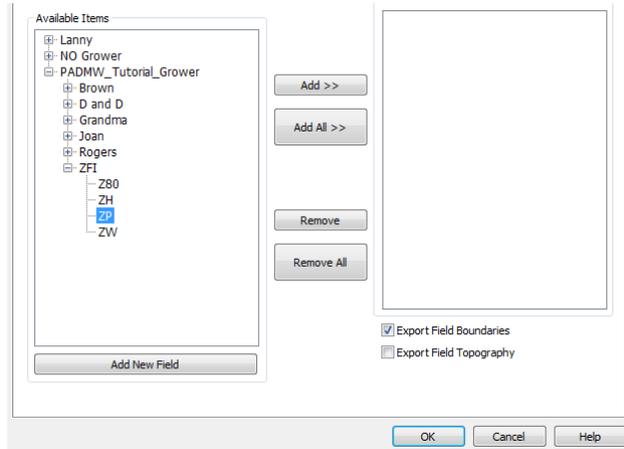
35. From here we have the option to **Export Single File to a Field Display/Monitor** or **Export to a Generic File Format**. Choose the top option and click **Start Device Setup Export**:



36. In the Add/Edit Setup Configuration you will first need to enter a name. Type something like “Planting Rx 2016”.

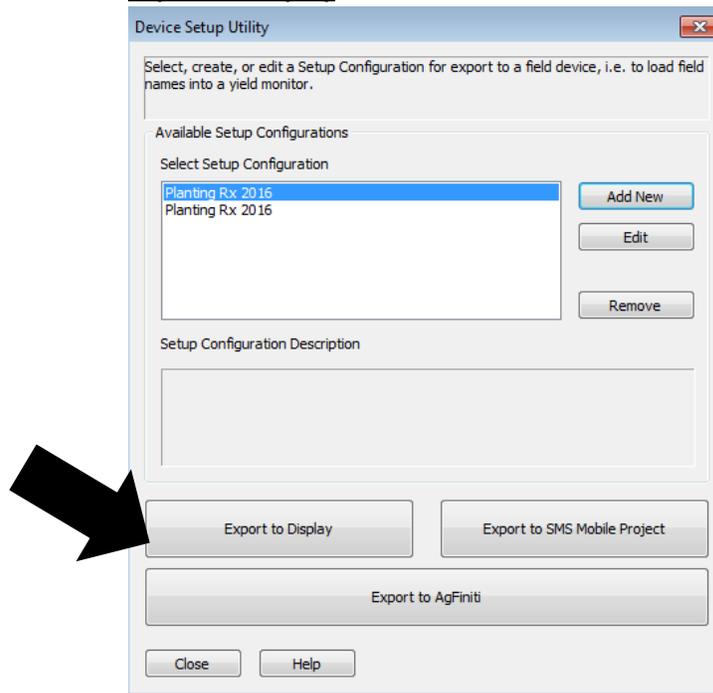


37. In the next tab “Fields Setup”, navigate to “PADMW\_Tutorial\_Grower” and select “ZFI” and “ZP”. Click **Add >>**.



38. On the last tab “spatial data setup”, select “Seeding Prescription” and select **Add>>** and then click **OK**.

39. The Device Setup Utility will appear. This allows you to choose your files for export, in this case, Planting Rx 2016. Click **Export to Display**.



40. In the Select Display to Export you can select what display you will be using. After making this selection, click the **Export to Selected Display** button and save the file to your computer or flash drive to upload in the tractor.