Scott Magnan's Introduction:

I grew up on a dairy in St. Albans which milked about 50cows. I attended Morrisville College completing an associates degree in Automotive technology in 1996. In 1997 I started my business offering custom crop services which at the time only included manure spreading, we have grown that part of the business to include many additional services including roundbaling, mowing, bunk packing, and planting. The custom operation provides services for a spectrum of operations from large dairies to small beef cow operations with just a few animals. We farm about 200 acres of crops ourselves which include corn, hay and sunflowers, we have also rotated small grains and soybeans into the rotation at times. In 2012 we started using GPS monitors to track manure application dates and fields as a way to better support the farmer in nutrient management planning, we had difficulties finding expertise in this area to accomplish our goals; in 2014 we sought to become a dealer for AgLeader technology and attended software training and in 2015 accomplished that goal and continue to have a working relationship with that company presently. This has opened the door not only to set new standards in our operation but to also assist other farmers with the setup installation and use of the technology. We have a CWIP grant through the Vermont Agency of Agriculture which allows us to offer training and support in this venture as well. I am the current chair for the Farmers Watershed Alliance for Franklin and Grand Isle county, a group that works with farmers to address water quality. I look forward to meeting your group tonight and hope to answer your questions and plan to use the materials as a reference to what I work on without going into deep detail.

The Power of Precision Agriculture in Vermont No-Till

December 14, 2020

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Professional Crop Services & Precision Ag. Management

Vermont

-Each acre of Vermont Soils has variability unique to the next, Precision Agriculture provides tools to identify, manage and lessen the variability found within this challenge.

-Laws and regulations require mandatory records

-All coverage maps in the presentation are from technology we are currently utilizing or trialing in this state

FIELD COMPUTERS & DISPLAYS

THE HEART OF A PRECISION AG OPERATION

Monitor, control, and record practices

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GPS RECEIVER

GPS SIGNALS

WASS: Free, 6”12” accuracy, poor repeatability

OMNI STAR, TERRA STAR: Paid services 4”-8” accuracy, good repeatability

RTK: Sub 1” accuracy, good repeatability, requires base station or access to an RTK network

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Progression timeline

Initial investment prioritizing one practice

Manure application monitoring for example

Data investment for analysis and reporting

Cloud program

Software

Advisor

Secondary investments in the field

Planting

Steering

Harvest

Soil profile

Integration/Evaluation/Utilization

Query tools

Prescriptions

Advisor meetings

Farm based decision leveraged negotiating

Apply well informed rate information to your field based on the data layers you have recorded.

Acting with precision

What needs to be addressed?

What tool do we need for the job?

Steering Systems

Often difficult to pick up row marker lines in no-till

Subsurface Fertility in No-till With Precision


GEA
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Control allows for slow speed at desired rate

STRIP TILL, Cultivating

-By adding fertilizer application tools during these practices, we address subsurface fertility, weed control and compaction in one operation.

-We need good pass to pass accuracy. A subscription service will be needed, RTK is recommended.

-Recorded and labeled guidance lines will help track nutrient placement for future reference and planning.

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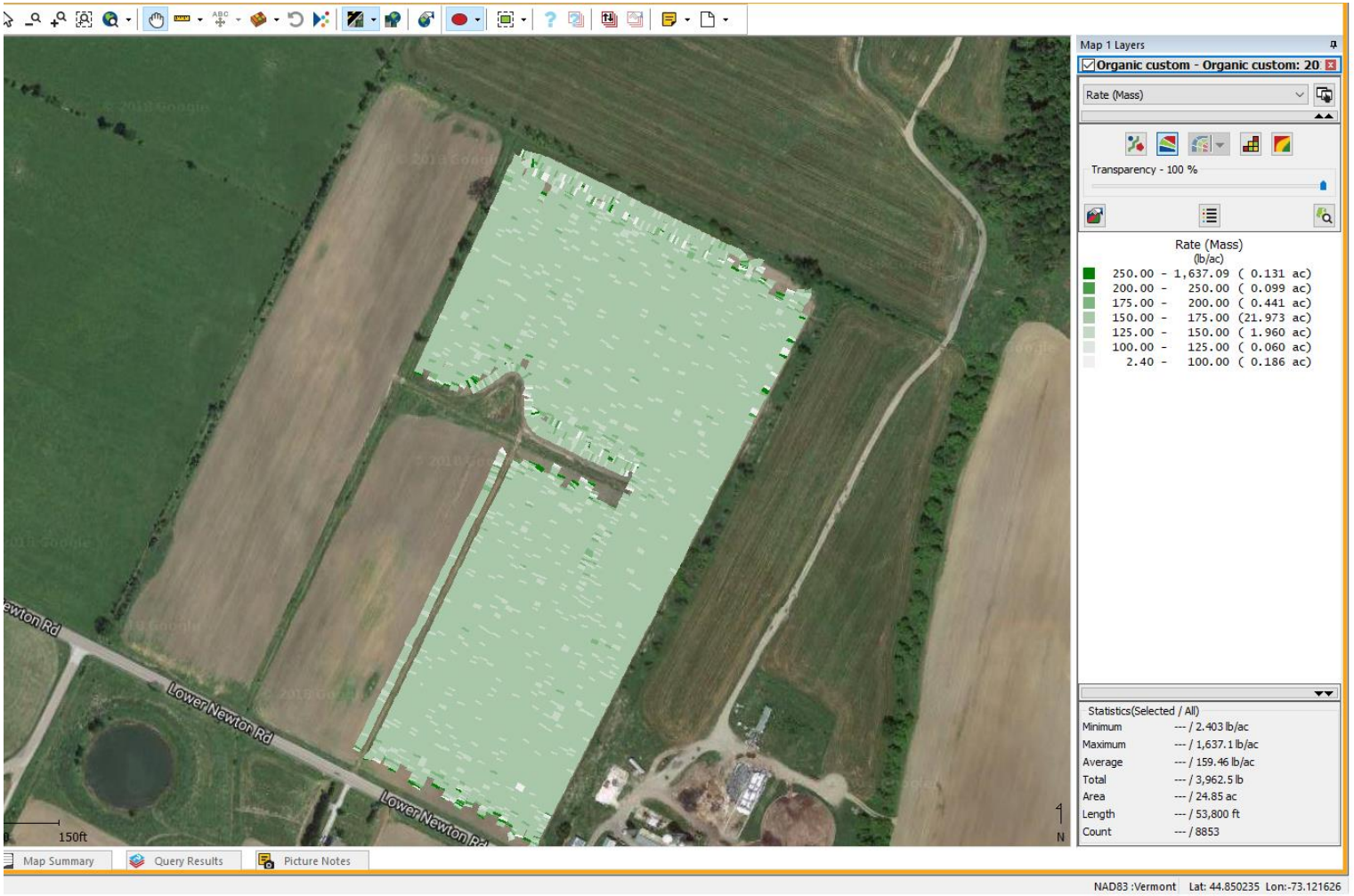
Strip till fertilizer application



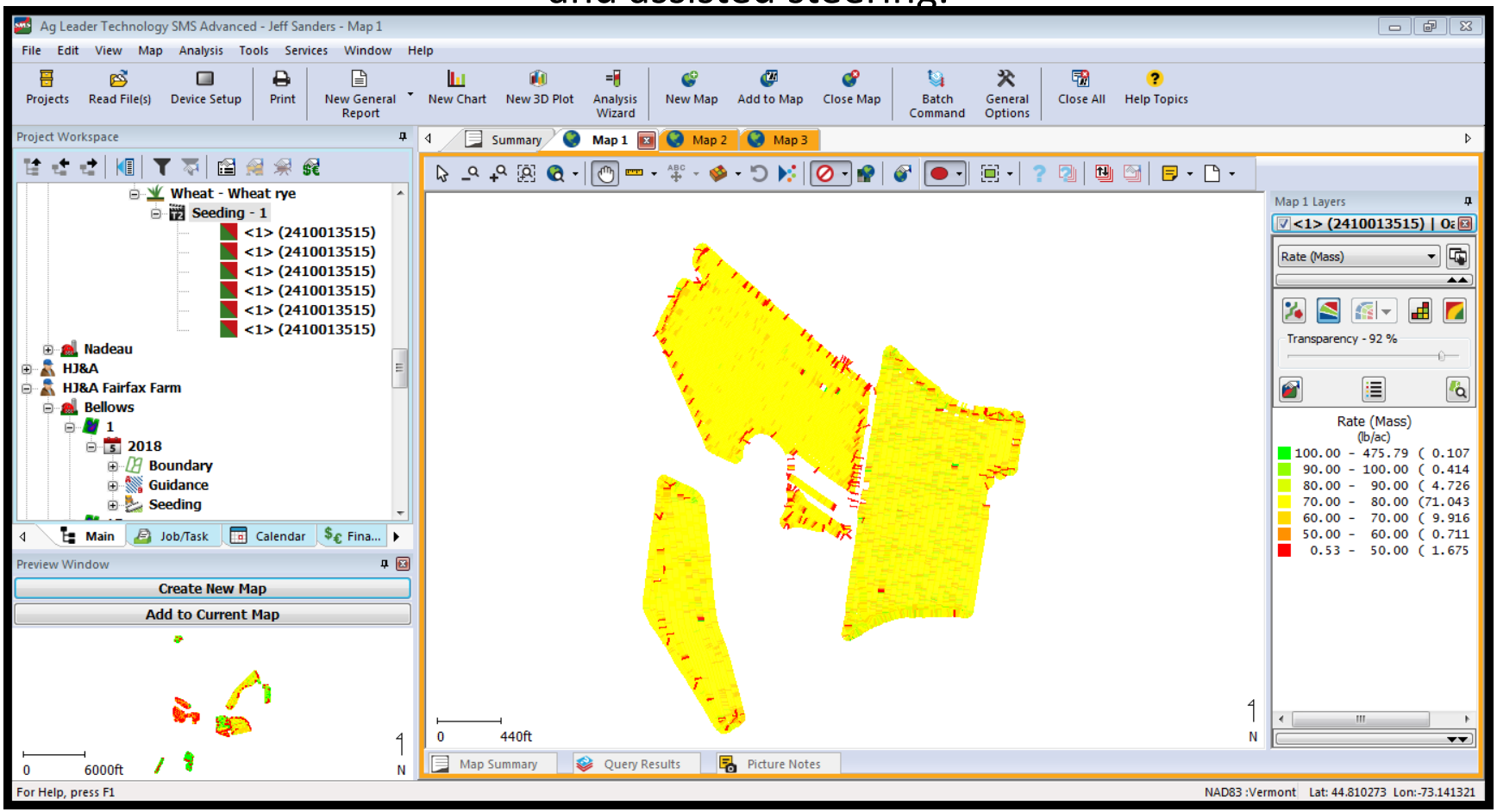
Cover Cropping

Pictured is an inner seeder that could be enhanced with a steering system and seed tube monitoring, same principles would apply to a grain drill or even broadcasting

Air Seeder

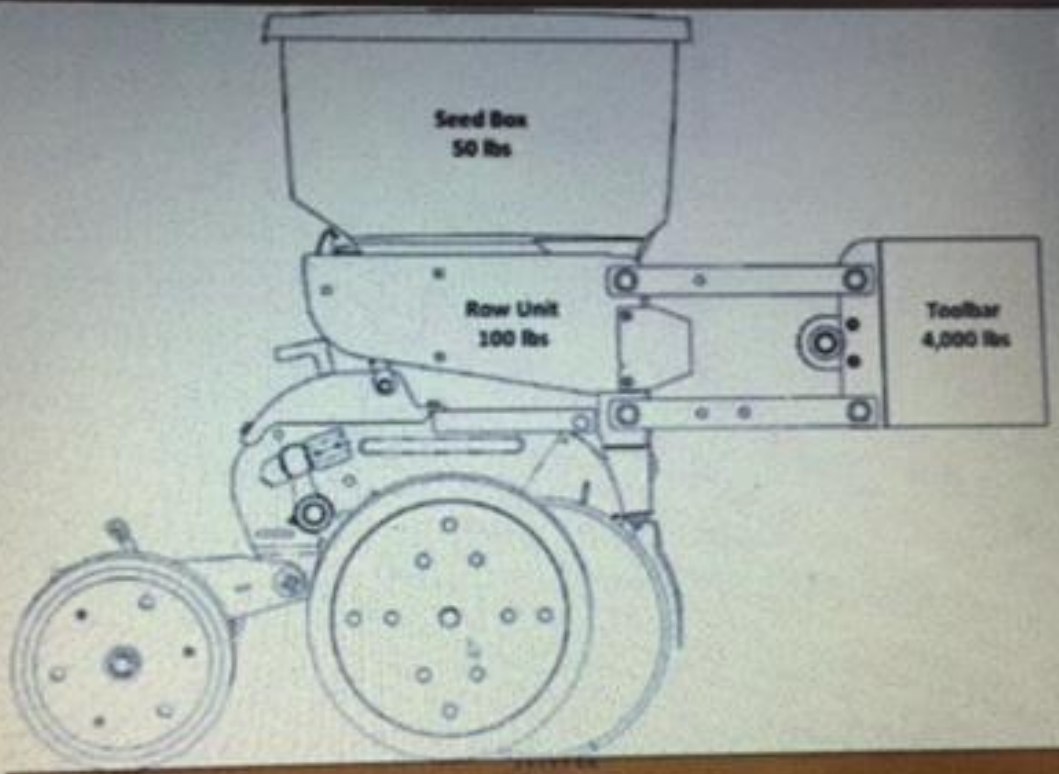
Air Seeder Map

Even coverage with ability to set a rate, used with automatic swath control and assisted steering.



Planting With Precision

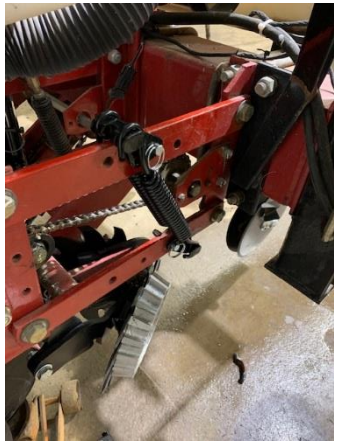
DYNAMICS OF ROW UNIT



Ag Leader

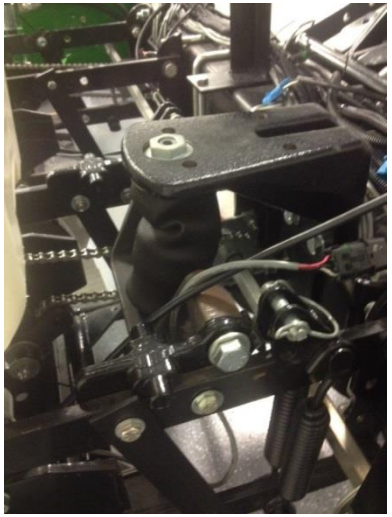
DOWNPRESSURE

Spring



Applies constant pressure with only manual adjustment

Pneumatic

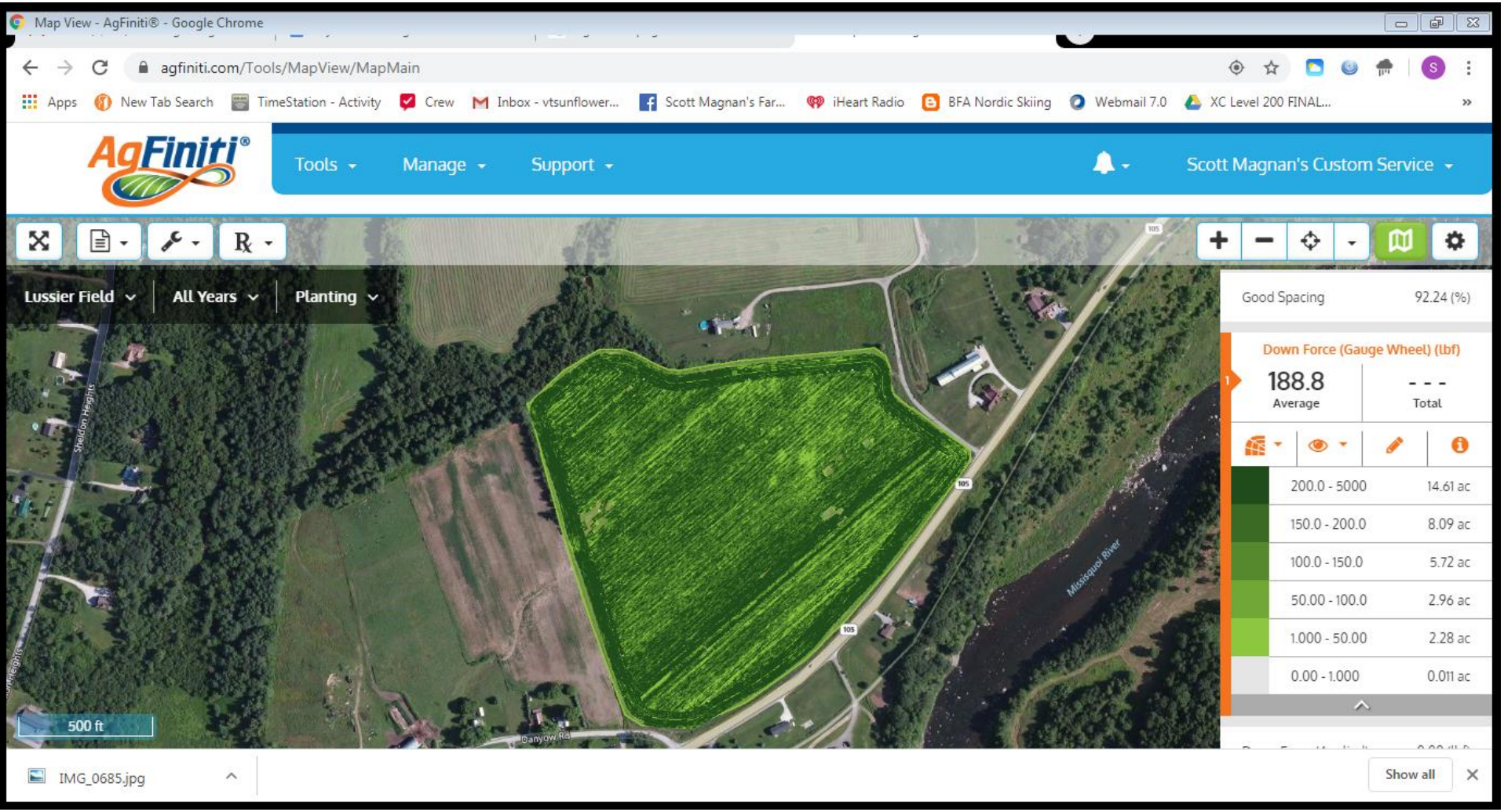


Applies down force to the row unit but takes several feet to adjust.

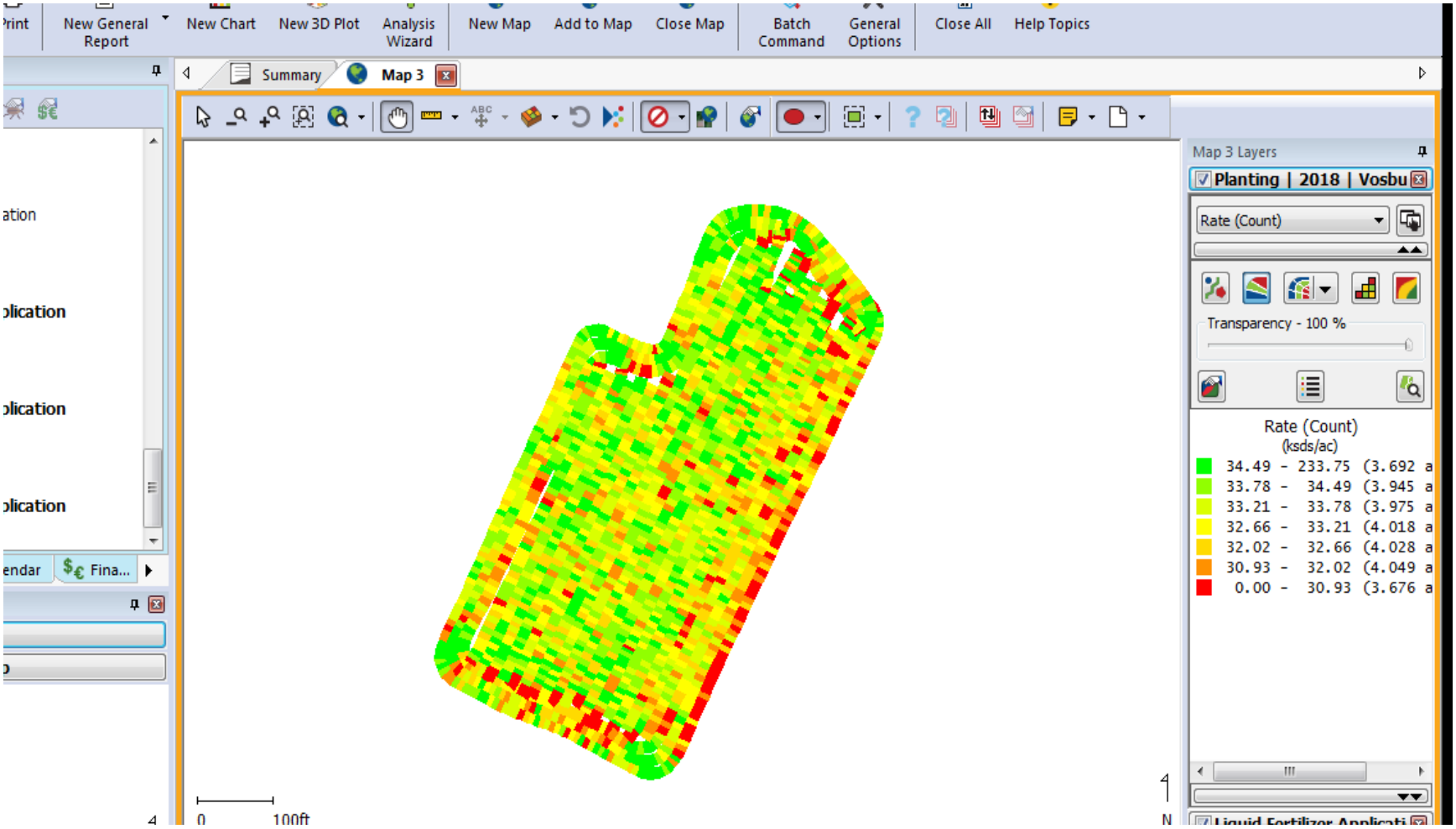
Hydraulic

Applies down force to row
unit within a second.

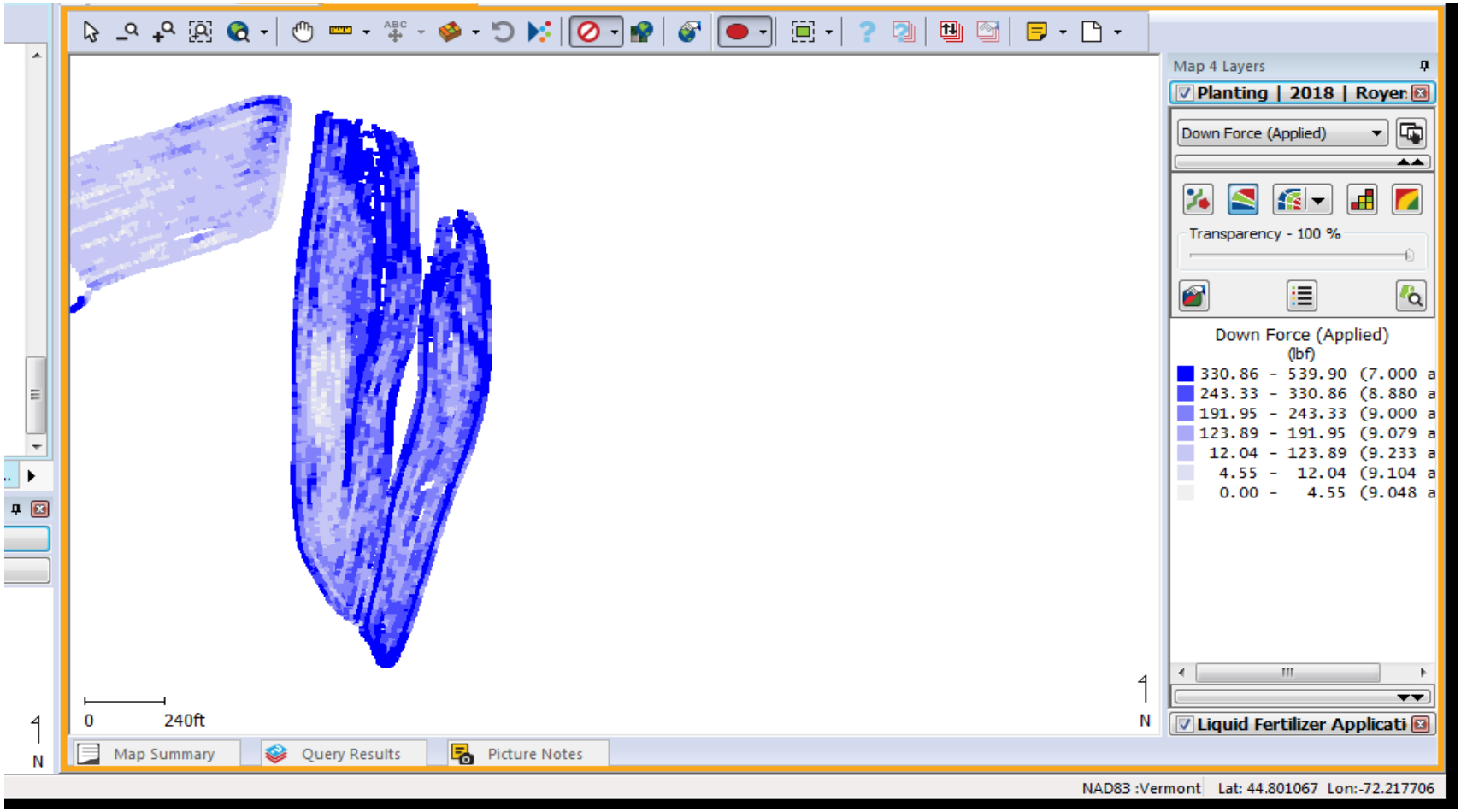
Monitored and spring adjusted downforce



Tilled field, Gauge wheel pressure



Down pressure applied



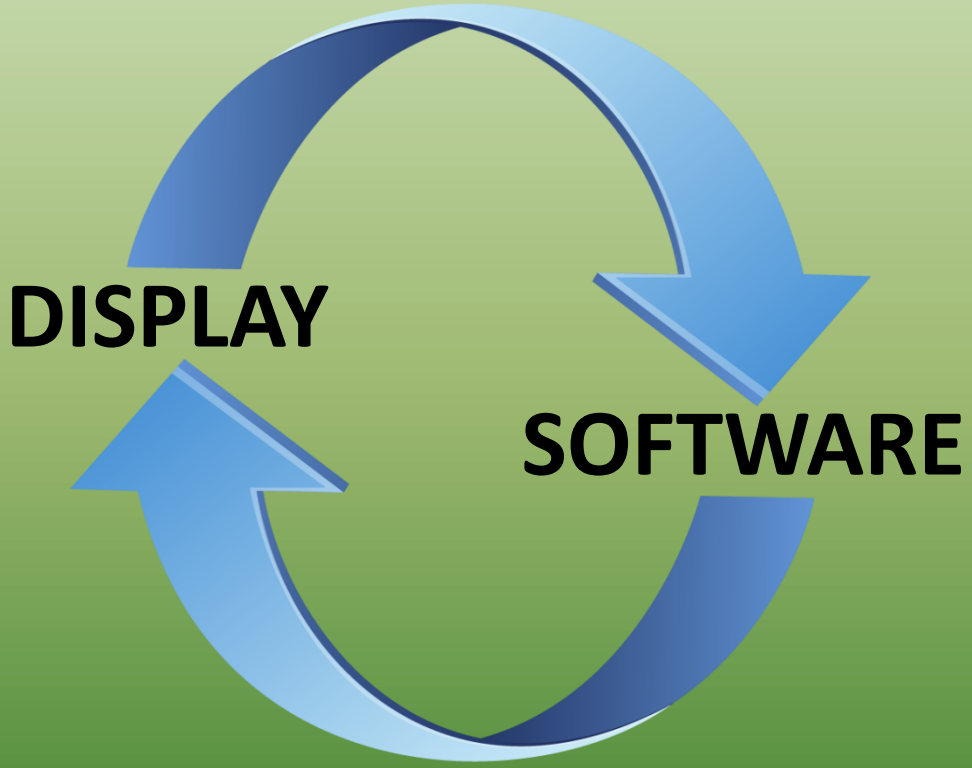
-Planted field road
-Potential soft spot
-Variability in seed bed
-Compaction Map
-Ledge

Poor fertility + Poor Planter Setup=Lost revenue, less nutrient uptake

Down pressure sensor data would have identified increased up pressure on the row unit from floating row cleaner

When soil health and planter setup are addressed you get positive results

Moving and Managing Data



CAN BE MOVED WITH A USB OR WIRELESSLY

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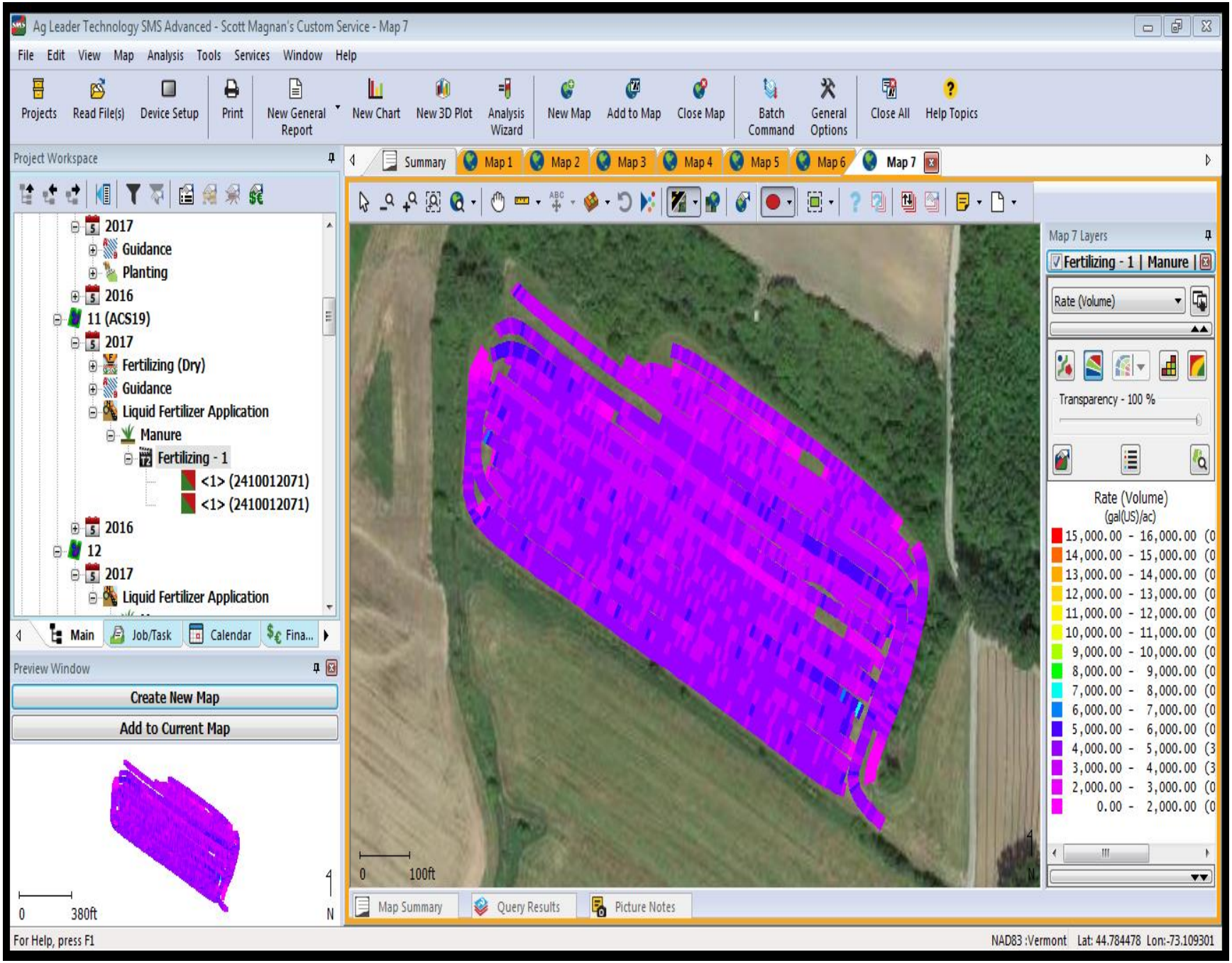
Ag Leader Technology SMS Advanced - Scott Magnan's Custom Service - Map 7
File Edit View Map Analysis Tools Services Window Help
Projects Read File(s) Device Setup Print New General Report New Chart New 3D Plot Analysis Wizard New Map Add to Map Close Map Batch Command General Options Close All Help Topics
Project Workspace
2017
Guidance
Planting
2016
11 (ACS19)
2017
Fertilizing (Dry)
Guidance
Liquid Fertilizer Application
Manure
Fertilizing - 1
<1> (2410012071)
<1> (2410012071)
2016
12
2017
Liquid Fertilizer Application
Main Job/Task Calendar Fina...
Preview Window
Create New Map
Add to Current Map
0 380ft N
Summary Map 1 Map 2 Map 3 Map 4 Map 5 Map 6 Map 7
0 100ft N
Map 7 Layers
Fertilizing - 1 | Manure
Rate (Volume)
Transparency - 100 %
Rate (Volume)
(gal(US)/ac)
15,000.00 - 16,000.00 (0
14,000.00 - 15,000.00 (0
13,000.00 - 14,000.00 (0
12,000.00 - 13,000.00 (0
11,000.00 - 12,000.00 (0
10,000.00 - 11,000.00 (0
9,000.00 - 10,000.00 (0
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4,000.00 - 5,000.00 (3
3,000.00 - 4,000.00 (3
2,000.00 - 3,000.00 (0
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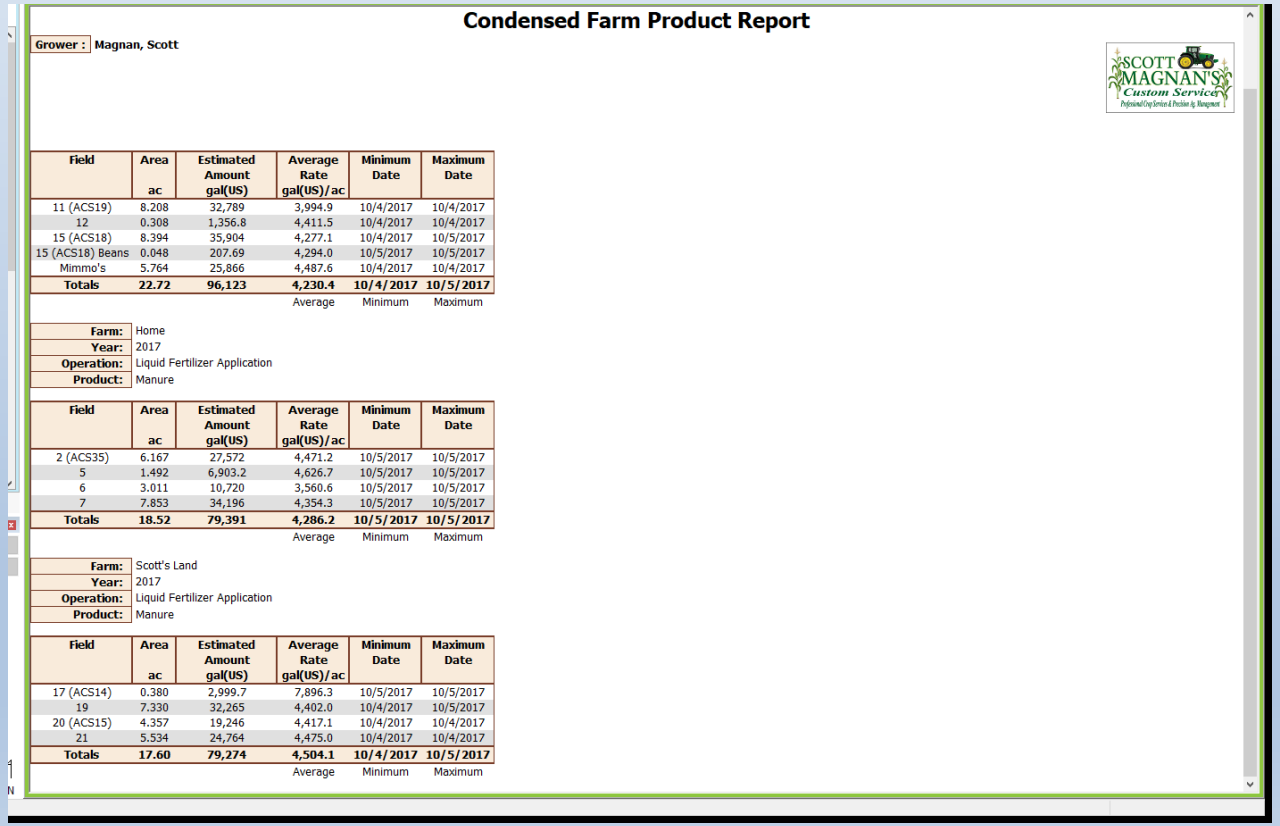
Map Summary Query Results Picture Notes
For Help, press F1
NAD83 :Vermont Lat: 44.784478 Lon:-73.109301

Quick accurate record keeping

-Increased efficiency when filing reports

-Enhances funding opportunities for your no-till operation

-Provides a tool for sound decision making



Condensed Farm Product Report

Grower : Magnan, Scott

Field	Area ac	Estimated Amount gal(US)	Average Rate gal(US)/ac	Minimum Date	Maximum Date
11 (ACS19)	8.208	32,789	3,994.9	10/4/2017	10/4/2017
12	0.308	1,356.8	4,411.5	10/4/2017	10/4/2017
15 (ACS18)	8.394	35,904	4,277.1	10/4/2017	10/5/2017
15 (ACS18) Beans	0.048	207.69	4,294.0	10/5/2017	10/5/2017
Mimmo's	5.764	25,866	4,487.6	10/4/2017	10/4/2017
Totals	**22.72**	**96,123**	**4,230.4**	**10/4/2017**	**10/5/2017**
			Average	Minimum	Maximum

Farm:	Home
Year:	2017
Operation:	Liquid Fertilizer Application
Product:	Manure

Field	Area ac	Estimated Amount gal(US)	Average Rate gal(US)/ac	Minimum Date	Maximum Date
2 (ACS35)	6.167	27,572	4,471.2	10/5/2017	10/5/2017
5	1.492	6,903.2	4,626.7	10/5/2017	10/5/2017
6	3.011	10,720	3,560.6	10/5/2017	10/5/2017
7	7.853	34,196	4,354.3	10/5/2017	10/5/2017
Totals	**18.52**	**79,391**	**4,286.2**	**10/5/2017**	**10/5/2017**
			Average	Minimum	Maximum

Farm:	Scott's Land
Year:	2017
Operation:	Liquid Fertilizer Application
Product:	Manure

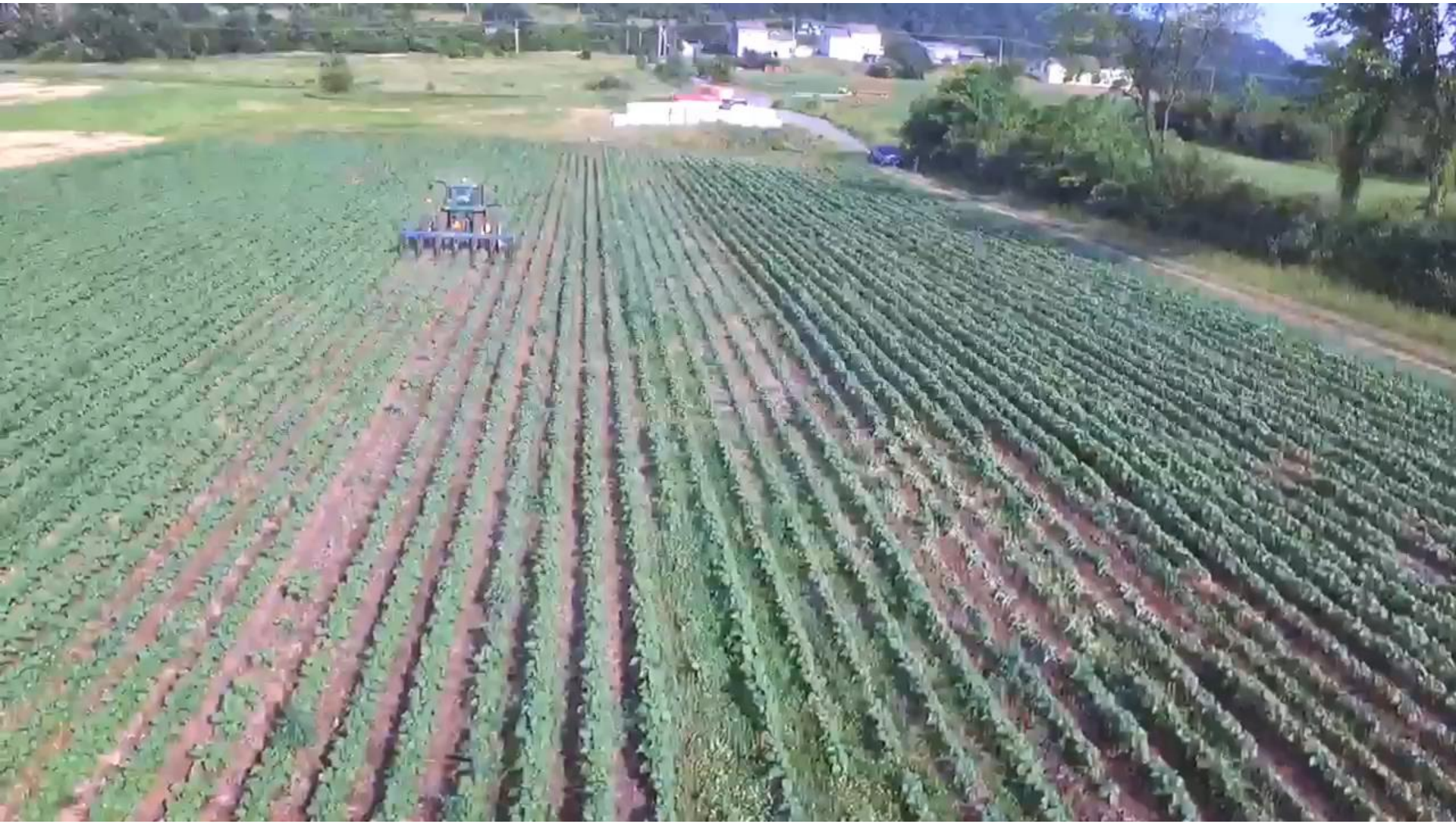
Field	Area ac	Estimated Amount gal(US)	Average Rate gal(US)/ac	Minimum Date	Maximum Date
17 (ACS14)	0.380	2,999.7	7,896.3	10/5/2017	10/5/2017
19	7.330	32,265	4,402.0	10/4/2017	10/5/2017
20 (ACS15)	4.357	19,246	4,417.1	10/4/2017	10/4/2017
21	5.534	24,764	4,475.0	10/4/2017	10/4/2017
Totals	**17.60**	**79,274**	**4,504.1**	**10/4/2017**	**10/5/2017**
			Average	Minimum	Maximum

Weed Control

Liquid application tools provide exact rate control and automatic shutoff of product.

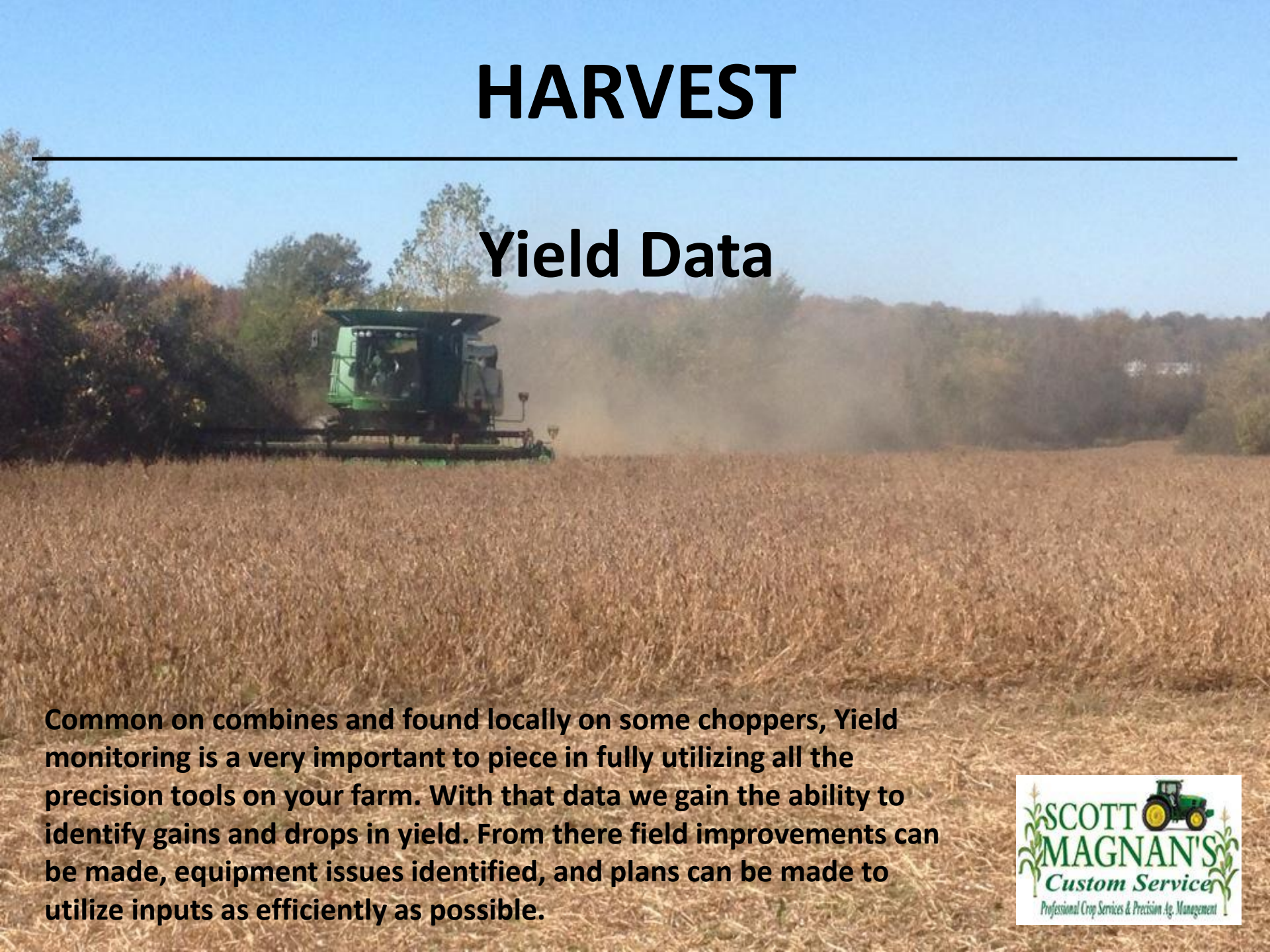
Steering control for application of products as well as improved efficiency and accuracy when using cultivation tools


In this photo a steering system was used while planting and again when cultivating using a flat cultivation point for minimal soil disturbance and weed control



HARVEST

Yield Data



Common on combines and found locally on some choppers, Yield monitoring is a very important to piece in fully utilizing all the precision tools on your farm. With that data we gain the ability to identify gains and drops in yield. From there field improvements can be made, equipment issues identified, and plans can be made to utilize inputs as efficiently as possible.

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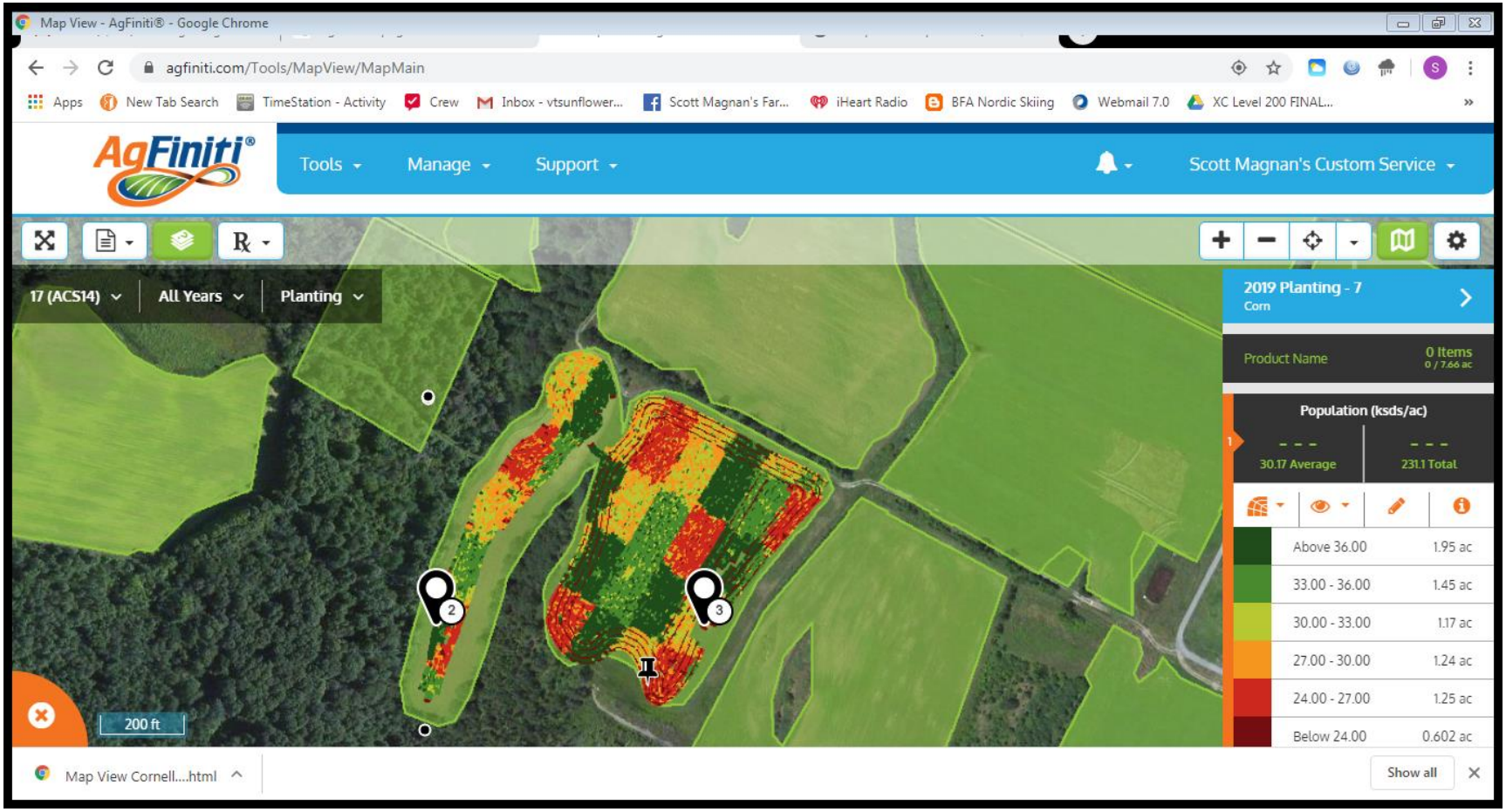
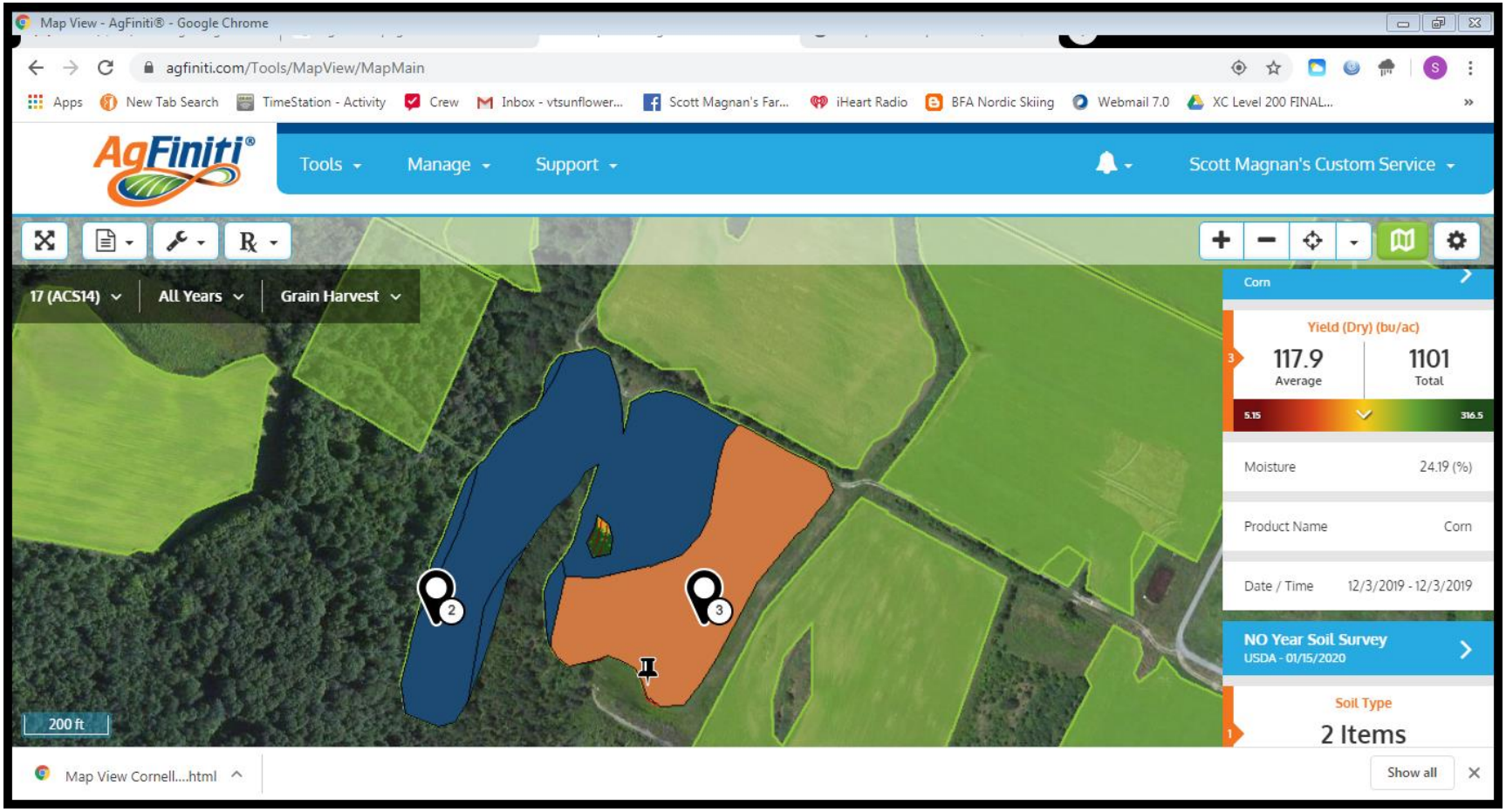
2019 Variable rate planting trial



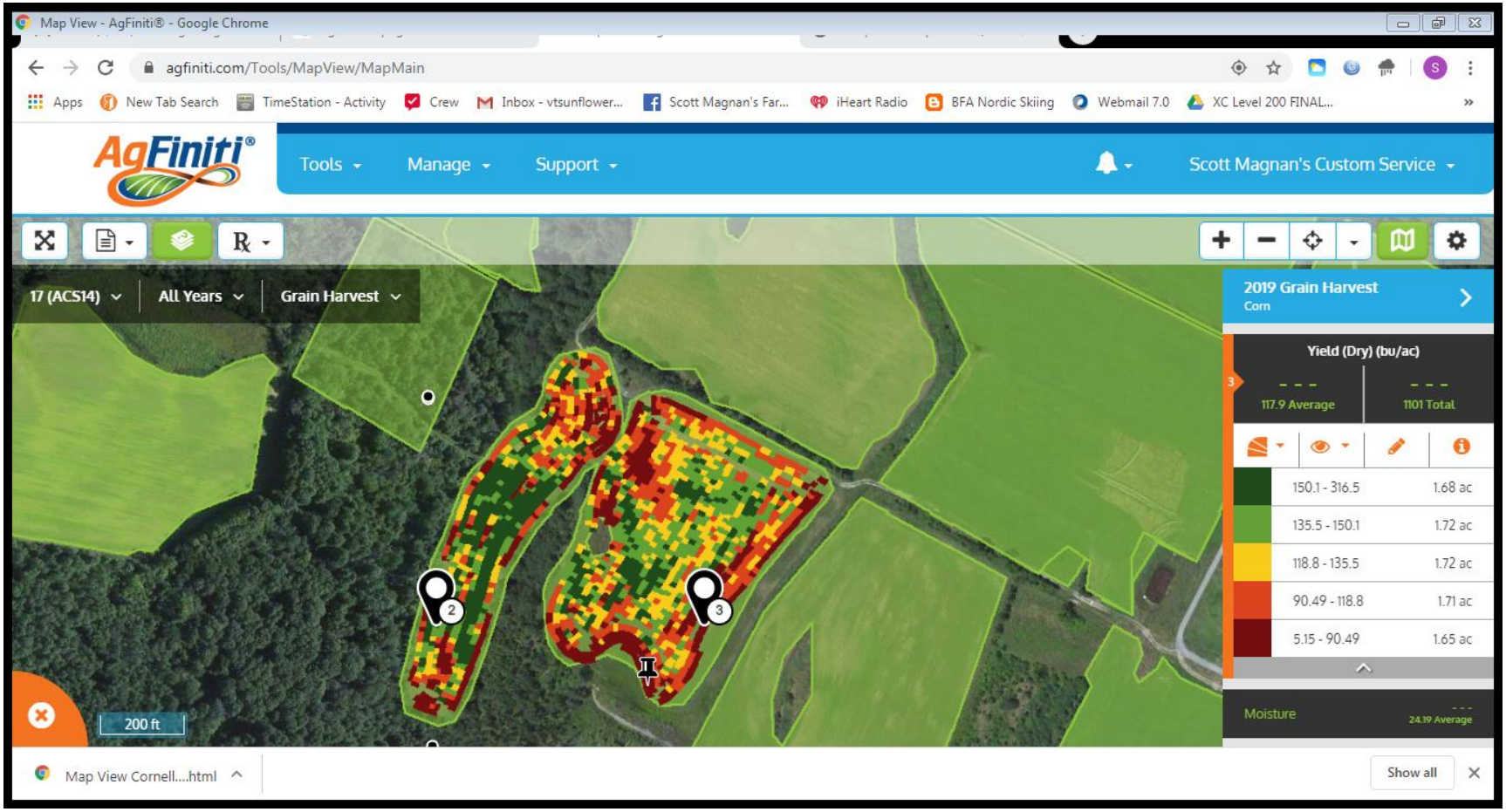
2 soil types within the field

Lordstown- well drain loam

Massena-Poorly drained heavier soil

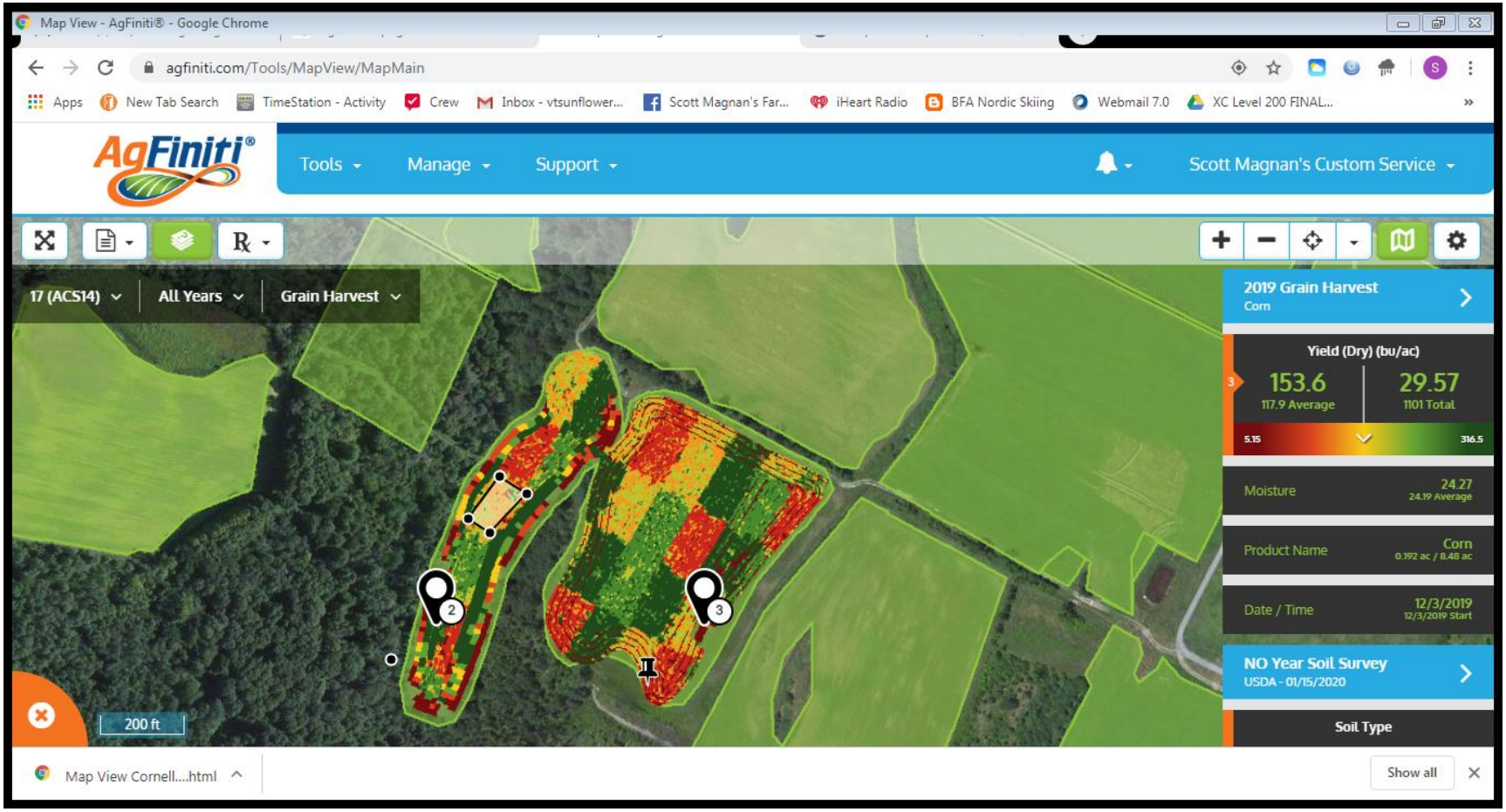


2019 yield data



Winner!

Why?


Map View - AgFiniti® - Google Chrome
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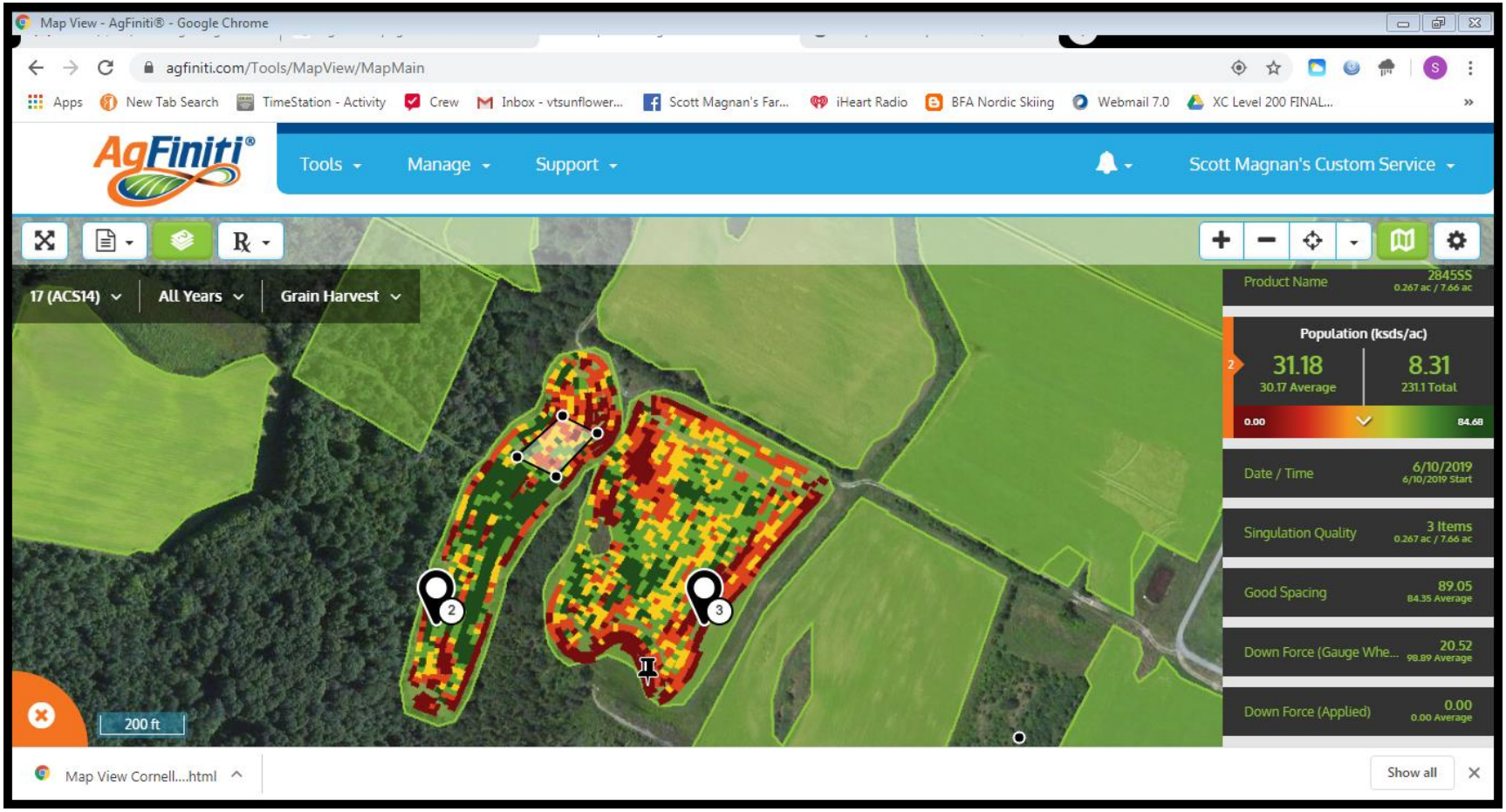
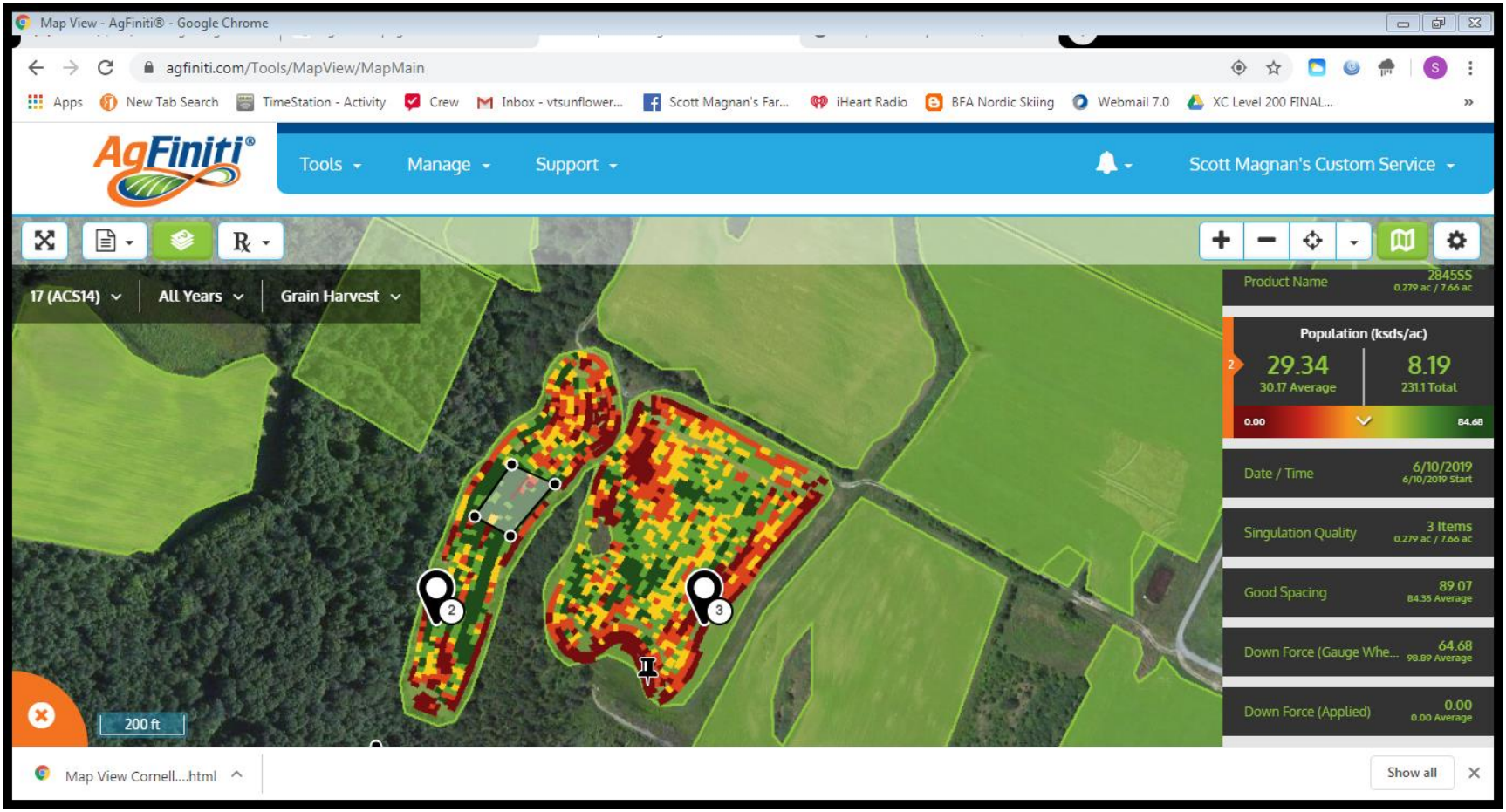
Scott Magnan's Far...
iHeart Radio
BFA Nordic Skiing
Webmail 7.0
XC Level 200 FINAL...
AgFiniti®
Tools
Manage
Support
Scott Magnan's Custom Service
17 (ACS14)
All Years
Grain Harvest
2019 Grain Harvest
Corn
Yield (Dry) (bu/ac)
153.6
117.9 Average
29.57
1101 Total
5.15
316.5
Moisture
24.27
24.19 Average
Product Name
Corn
0.192 ac / 8.48 ac
Date / Time
12/3/2019
12/3/2019 Start
NO Year Soil Survey
USDA - 01/15/2020
Soil Type
200 ft
Map View Cornell....html
Show all

Was population the key factor?
Down pressure 20.52lbs Yield 117b/u



Down pressure 64.68lbs Yield 153BU



AgFiniti® Powered By Ag Leader®

2019 | Corn

Magnan, Scott | All Farms | 17 (ACS14)

Corn

Soil Type	Yield (Dry) (bu/ac)	Moisture (%)	Area (ac)
Lordstown	123.9	24.26	5.25
Massena	116.7	23.77	3.22
Total	**121.2**	**24.07**	**8.47**

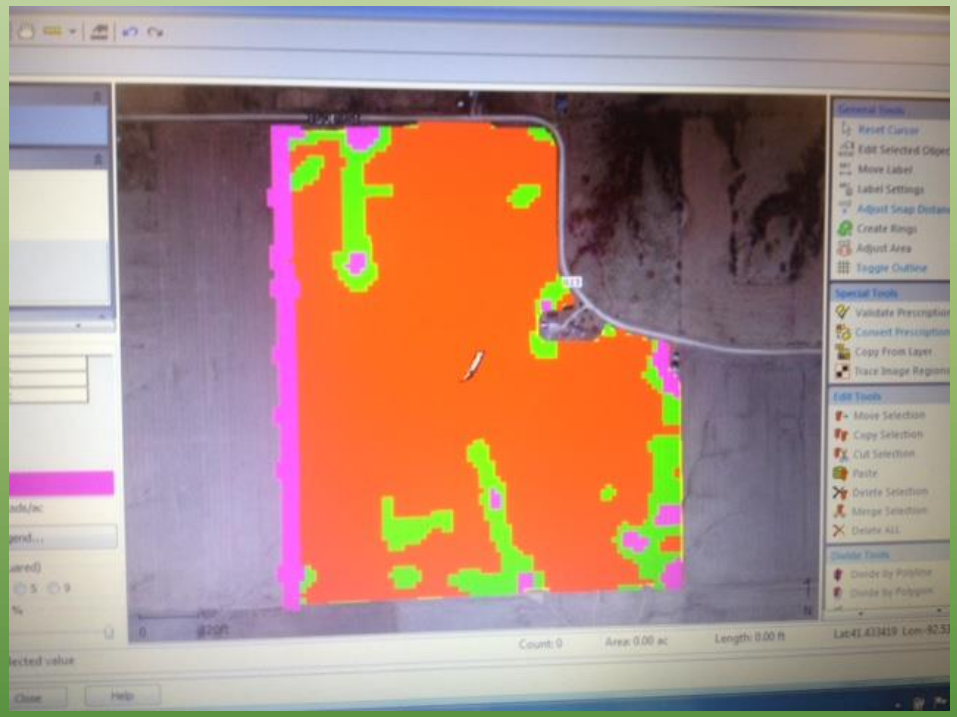
Corn

Population (kseds/ac)	Yield (Dry) (bu/ac)	Moisture (%)	Area (ac)
Below 24.00	100.1	23.83	0.861
24.00 - 27.00	117.6	23.78	1.59
27.00 - 30.00	125.6	23.94	1.13
30.00 - 33.00	127.1	24.04	1.45
33.00 - 36.00	134.3	24.25	1.32
Above 36.00	124.8	24.24	1.29
Total	**122.7**	**24.02**	**7.63**

PRESCRIPTION WRITING

Map predetermined rates for seeding, fertilizing and manure application using a software program.

Base the prescription on a variety of map layers and previously recorded data.



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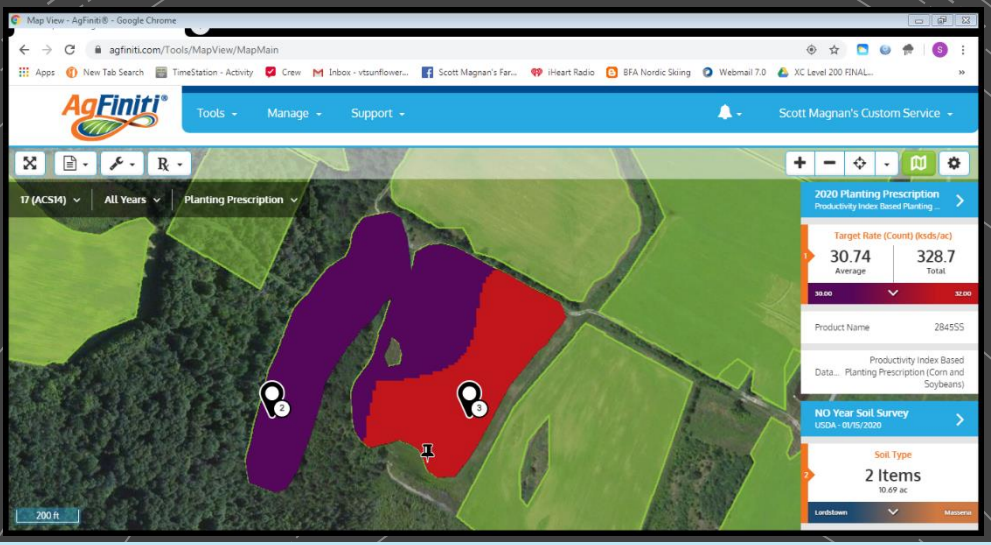
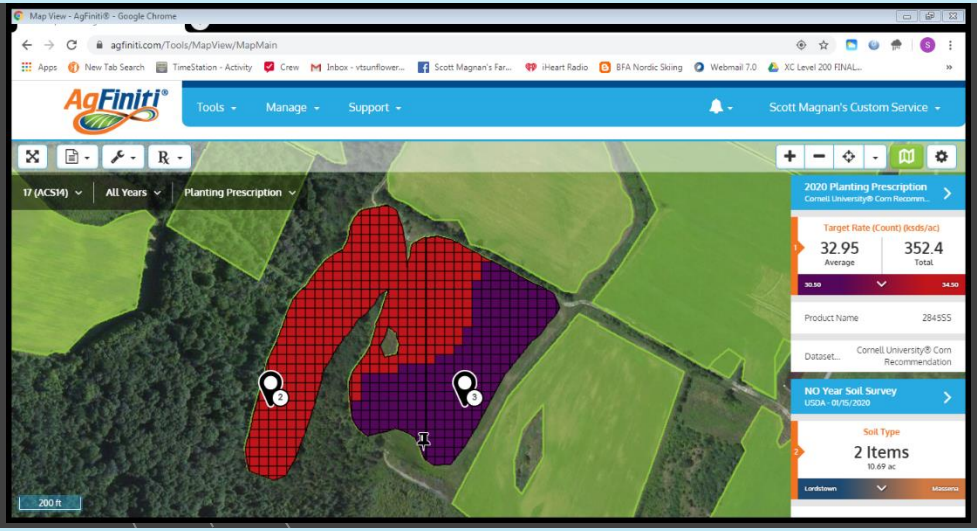


Productivity Index Based Planting Prescription (Corn and Soybeans)

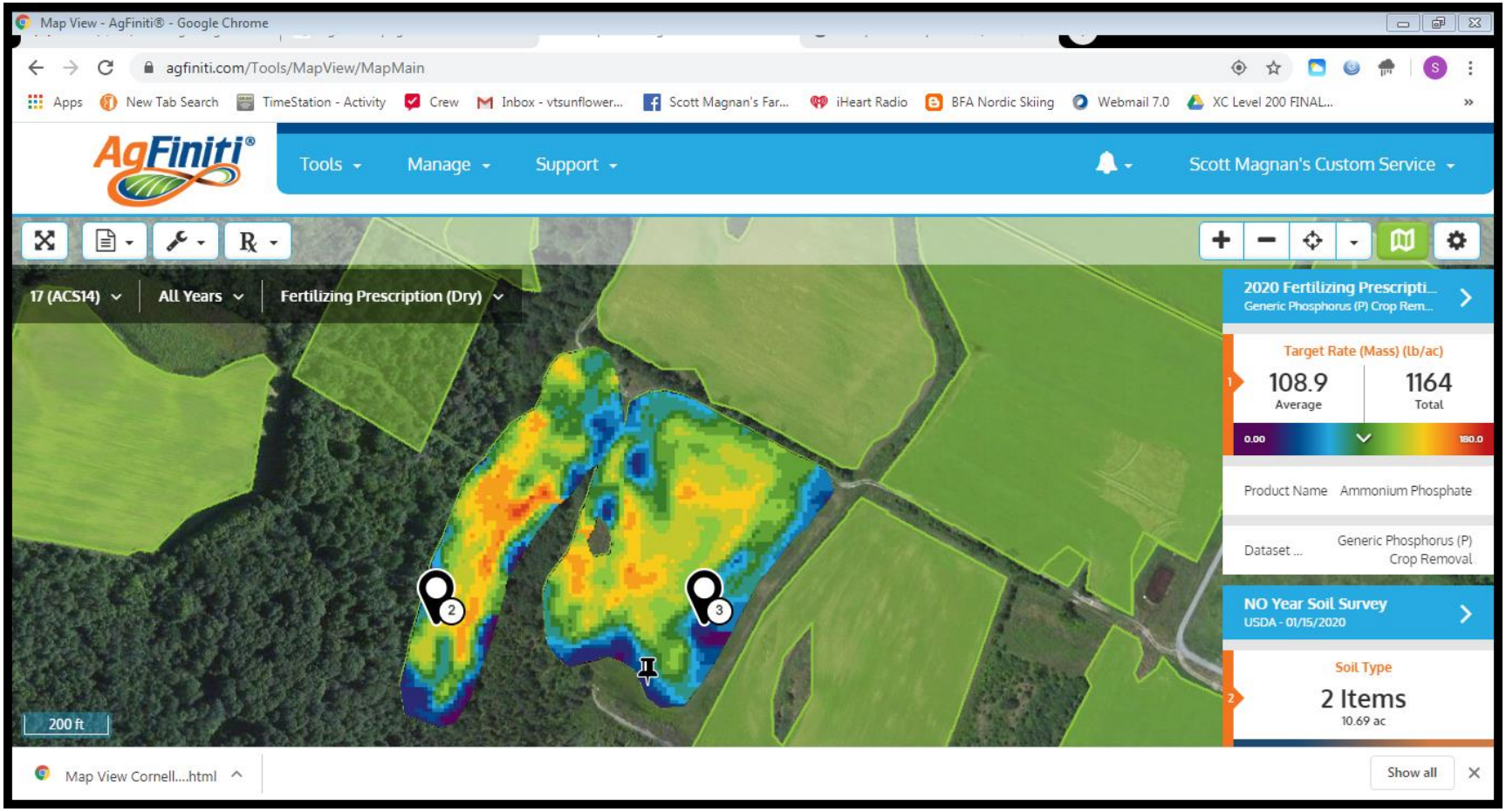
This equation calculates a ratio between Grain Harvest data for corn and soybeans and the National Commodity Crop Productivity Index (NCCPI) from United States Soil Survey data, and helps you create three management zones to apply different planting rates for corn or soybeans.

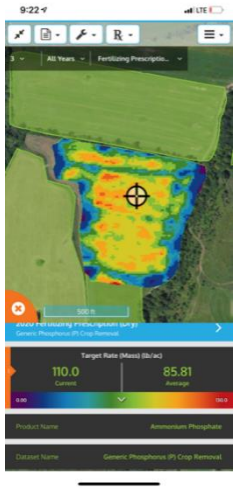


Cornell University® Corn Recommendation

This equation calculates how much corn to plant based on desired harvest population, soil survey information, and location of installed tile.

2020 Fertilizer P Prescription based off 2019 crop removal





Variable rate fertilizer application

Questions?

Ag Leader®

- Scott Magnan
- Email scttmgnn@gmail.com
- Phone (802) 363-7707

RAVEN

Yetter
FARM EQUIPMENT