

Improving Quality of Yield Data for Farm Management

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Department of Agricultural Economics

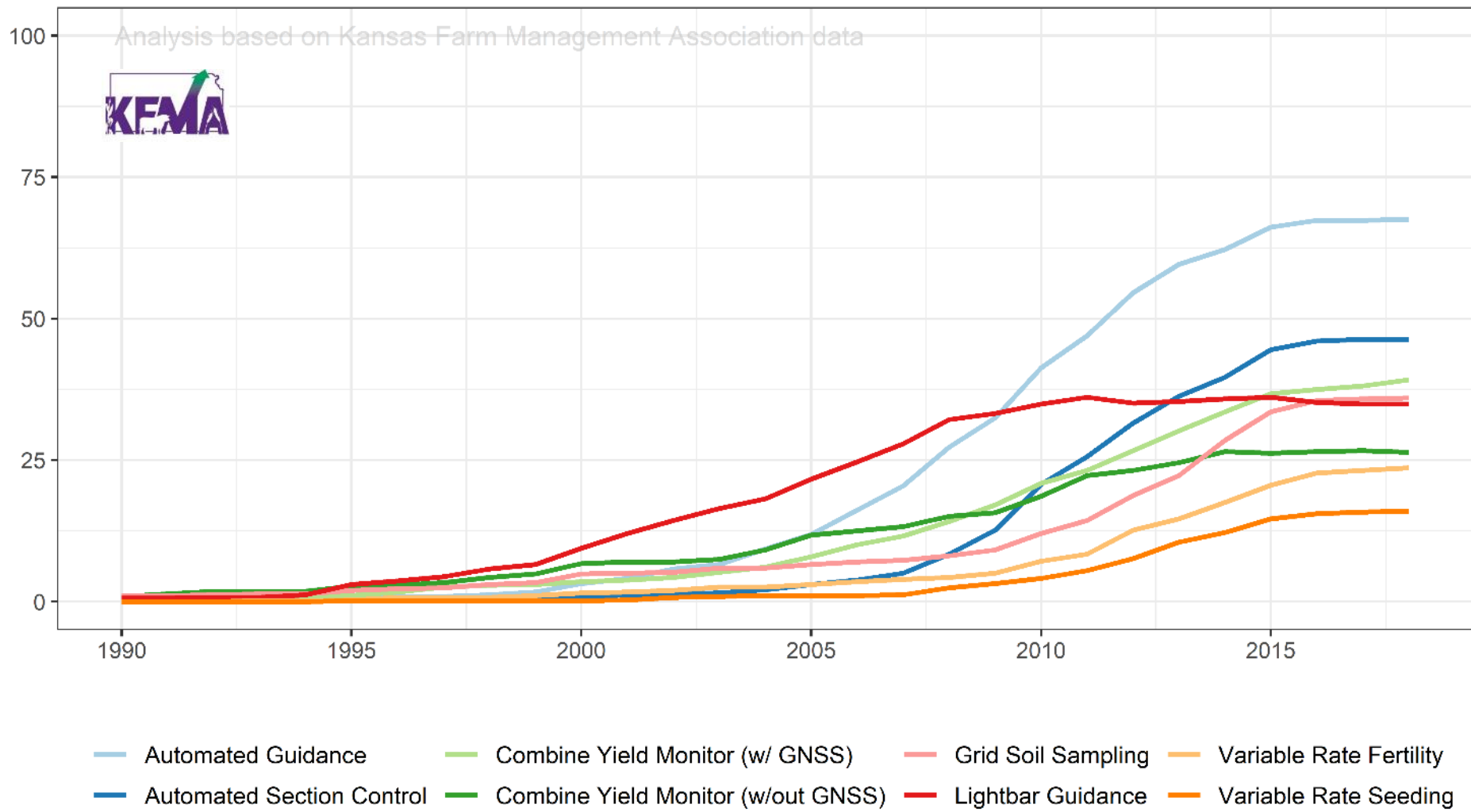
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@SpacePlowboy



The basic question: $B > C$?







Managing Yield Data


- Begin with “best” data possible
- Flag erroneously measured yield data for omission
 - Yield monitor not always able to measure properly
- Adjust observation location
 - Flow delays, start & end pass delays
- USDA-ARS Yield Editor
 - Some farm software has integrated Yield Editor
 - Takes about 45 minutes
 - Version 2.0.7 automates several settings
 - Still requires time and human capital

So what?

- Fact: Portion of yield data measured erroneously
- Analysis compared *unprocessed* and *cleaned*
 - Assumes *cleaned* is best and compare 'results'
 - Default settings of farm-software (*unprocessed*)
- Conscious filtering of yield data (*cleaned*)
 - 10 parameters
 - Flow delay adjustment, flag 'bad' measurements
- Unprocessed yield data same decision ~30% studies

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**YIELD MONITOR DATA ANALYSIS PROTOCOL: A PRIMER IN THE
MANAGEMENT AND ANALYSIS OF PRECISION AGRICULTURE DATA**

by

Terry W. Griffin^a, Jason P. Brown^b, and Jess Lowenberg-DeBoer^c

<https://www.agriculture.purdue.edu/ssmc/publications/yielddataanalysis2007.pdf>

Required data fields in **bold** for emulating AgLeader advanced file format.

1) Longitude	<i>decimal degress, negative in W hemisphere</i>
2) Latitude	<i>decimal degrees, negative in S hemisphere</i>
3) Flow	<i>pounds per second</i>
4) GPSTime	seconds
5) Logged Interval	<i>seconds</i>
6) Distance	<i>inches</i>
7) Swath	<i>inches</i>
8) Moisture	percent wet basis
9) Header Status	unitless, 1 = harvesting, 0 = not harvesting
10) Pass Number	<i>unitless, generally +1 each header up/down cycle</i>

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First 5 rows of sample data

sample1 - Notepad

File Edit Format View Help

```
-93.258294,39.296978,2.92,971213672,1,24.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ", "Soybeans", "F9891RRN",1381.17  
-93.258294,39.296981,3.62,971213673,1,21.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ", "Soybeans", "F9891RRN",1381.17  
-93.258288,39.296986,3.92,971213674,1,23.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ", "Soybeans", "F9891RRN",1381.17  
-93.258286,39.296989,1.22,971213675,1,31.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ", "Soybeans", "F9891RRN",1381.17  
-93.258280,39.296997,1.92,971213676,1,35.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ", "Soybeans", "F9891RRN",1381.17
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-93.258294,39.296978,2.92,971213672,1,24.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ","Soybeans","F9891RRN",1381.17
-93.258294,39.296981,3.62,971213673,1,21.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ","Soybeans","F9891RRN",1381.17
-93.258288,39.296986,3.92,971213674,1,23.00,288.00,9.67,1,1,213647360,"F1: C1N","L1: ","Soybeans","F9891RRN",1381.17
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Load/Import File

Filtering, Mapping and Editing

Save/Export File

Import AgLeader Advanced or Greenstar Text File

Select Grain Type and Properties

Crop Type	Density	Market Moisture
Corn	56	15.5
Soybean	60	13.0
Sorghum	56	13.0
Wheat	60	13.5

Selected Grain Type and Properties

Soybean 60 13.0

 Edit Table?

UTM Conversion Settings

UTM Conversion is used here for mapping purposes, and can be exported instead of, or in addition to, geographic coordinates. In the RARE case that a specific UTM zone is required, the forced zone value can be set to achieve the desired projection.

 Computed Zone Forced Zone

Complete



Import

Load Filter and Configuration Settings

Load Config

Help and Links

[Open .pdf Manual](#)
[Download Site](#)
[Send an Email](#)
[About Yield Editor](#)

Automated Options

- No automated filtering.
 Interactive auto/manual filtering.
 Automatic filtering only.

Preview Import File: C:\Program Files (x86)\Yield_Editor\samples\sample1.txt

```

-93.258294,39.296978,2.92,971213672,1.24,00,288.00,9.67,1.1,213647360,"F1: C1N","L1: ""Soybeans","F9891RRN",1381.17
-93.258294,39.296981,3.62,971213673,1.21,00,288.00,9.67,1.1,213647360,"F1: C1N","L1: ""Soybeans","F9891RRN",1381.17
-93.258288,39.296986,3.92,971213674,1.23,00,288.00,9.67,1.1,213647360,"F1: C1N","L1: ""Soybeans","F9891RRN",1381.17
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-93.258241,39.297034,5.36,971213681,1.43,00,288.00,9.67,1.1,213647360,"F1: C1N","L1: ""Soybeans","F9891RRN",1381.17
  
```

Load Previous Yield Editor Session

Preview Session Log and Notes

```


```

Load Session

Version 2.0.7

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input type="checkbox"/>	-4	<input type="radio"/> Flow Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	0
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	952
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	165
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

<F10> Apply Filters

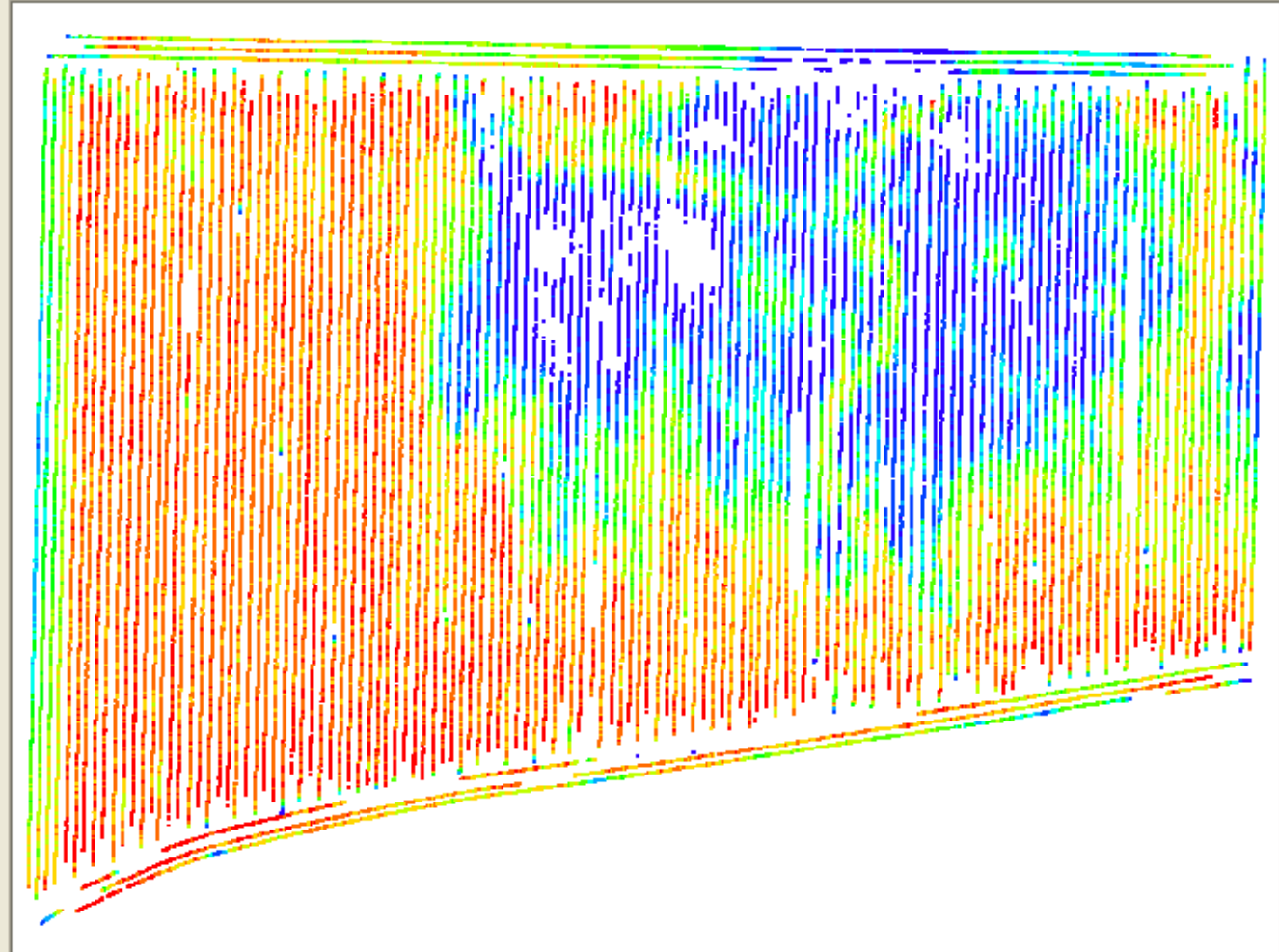
Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.31	71.20	48.0	34697	10-275
Raw	152.78	76.30	49.9	37465	10-414

Map and

Easting 263532
Northing 4483617

Unprocessed yield data

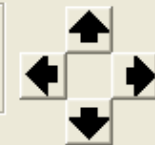
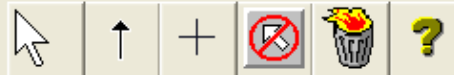


Nsecs	RmCode	Pass	Point

Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m)

1.25

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Flow Delay	642
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Moisture Delay	0
<input checked="" type="checkbox"/>	4	<input type="radio"/> Start Pass Delay	642
<input checked="" type="checkbox"/>	6	<input type="radio"/> End Pass Delay	324
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	274
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	6
<input type="checkbox"/>		<input checked="" type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

Adjust for Moisture? Expand Dry?

15.5 Manual Moisture Setting

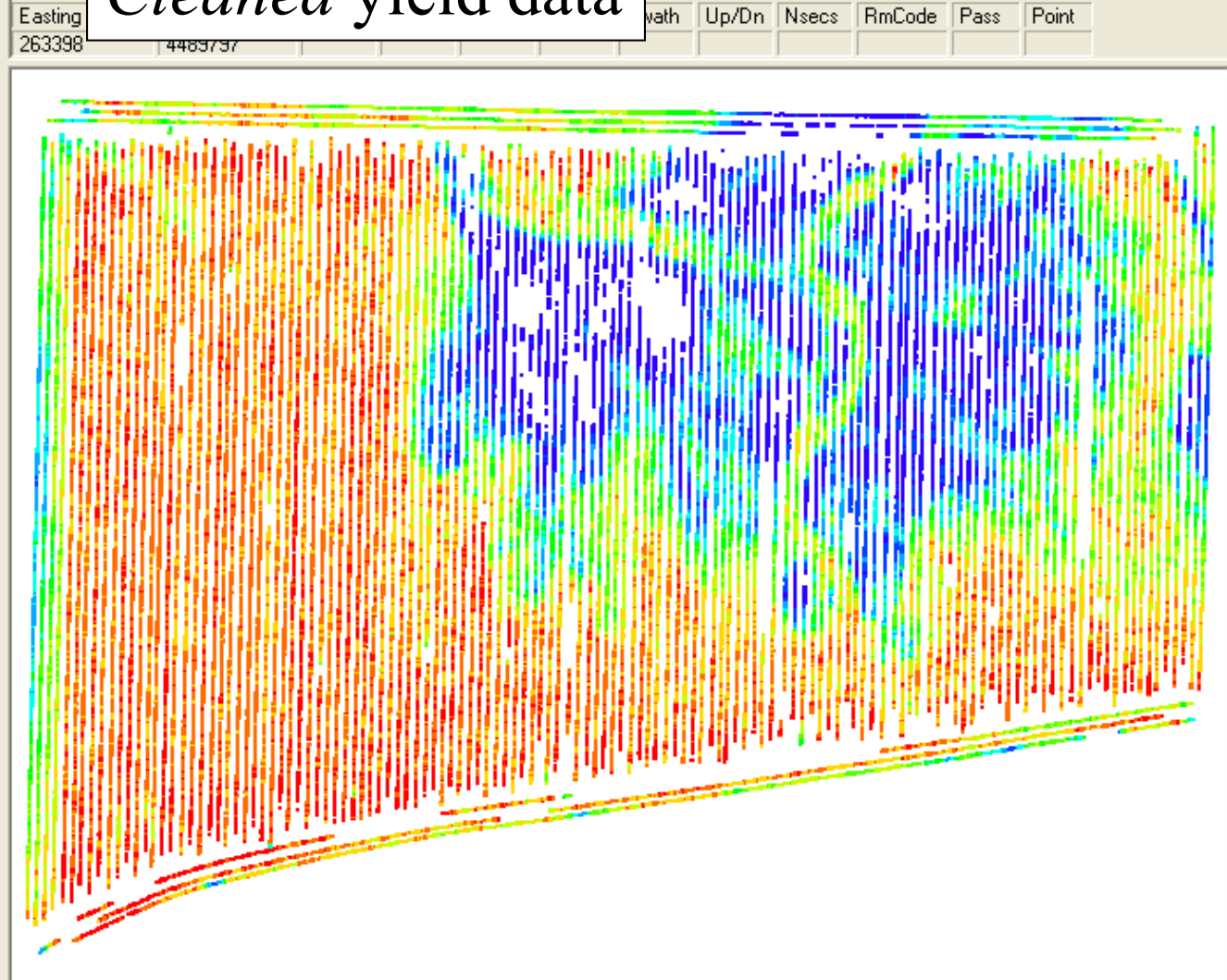
Sensor Based?

Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.86	71.13	47.8	34439	6-275
Raw	152.78	75.64	49.5	37465	10-414

Map and

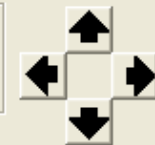
Cleaned yield data



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m)

1.5

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input type="checkbox"/>	-4	<input type="radio"/> Flow Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	0
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	952
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	165
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0
<input type="checkbox"/>	Position Filter	To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

<F10>
Apply Filters

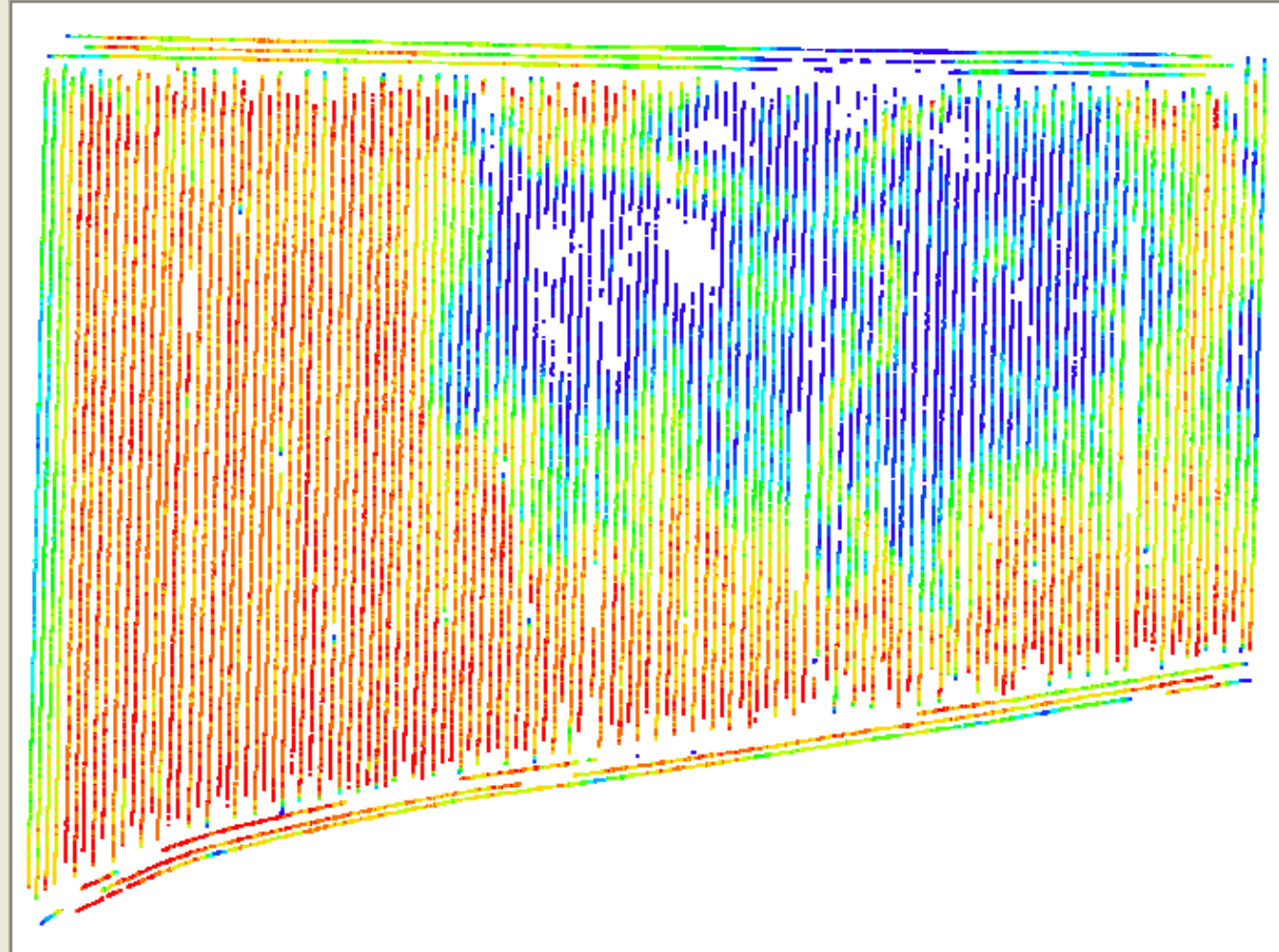
Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.31	71.20	48.0	34697	10-275
Raw	152.78	76.30	49.9	37465	10-414

Map and

Easting
263532

Unprocessed yield data

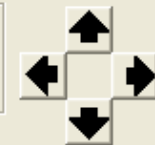


Nsecs	RmCode	Pass	Point

Zoom Tools



Manual Editing Tools



<< Advanced

Display
Symbol
Size (m)

1.25

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Flow Delay	642
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Moisture Delay	0
<input checked="" type="checkbox"/>	4	<input type="radio"/> Start Pass Delay	642
<input checked="" type="checkbox"/>	6	<input type="radio"/> End Pass Delay	324
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	274
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	6
<input type="checkbox"/>		<input checked="" type="radio"/> Header Down Req	0
<input type="checkbox"/>		<input type="radio"/> Position Filter	0

Easting **Manual Deletes**
 Northing

Adjust for Moisture? Expand Dry?

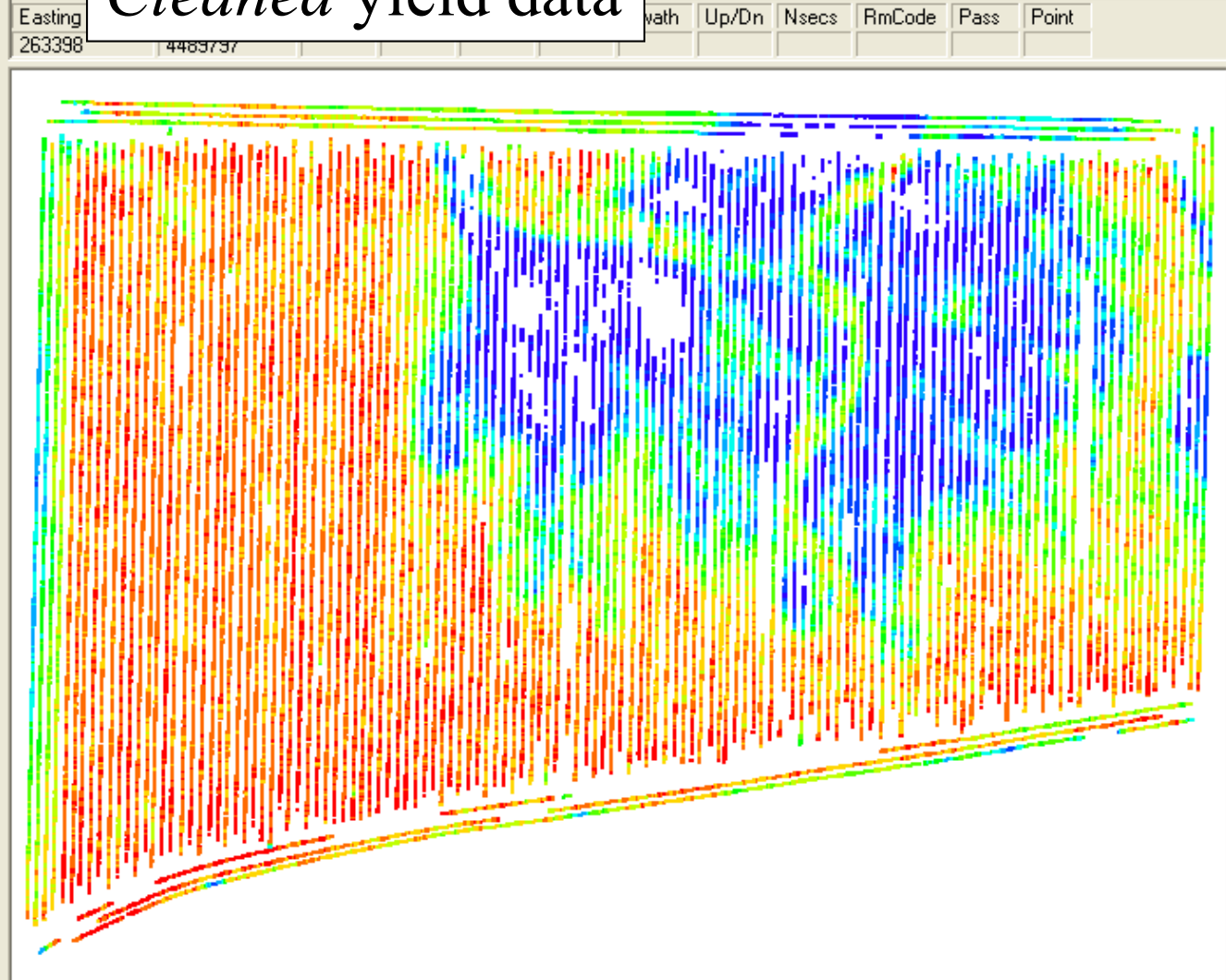
Manual Moisture Setting

Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.86	71.13	47.8	34439	6-275
Raw	152.78	75.64	49.5	37465	10-414

Map and

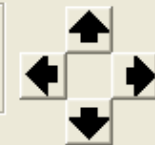
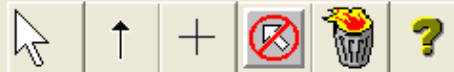
Cleaned yield data



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m) 1.5

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input type="checkbox"/>	-4	<input type="radio"/> Flow Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	0
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	952
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	165
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

<F10> Apply Filters

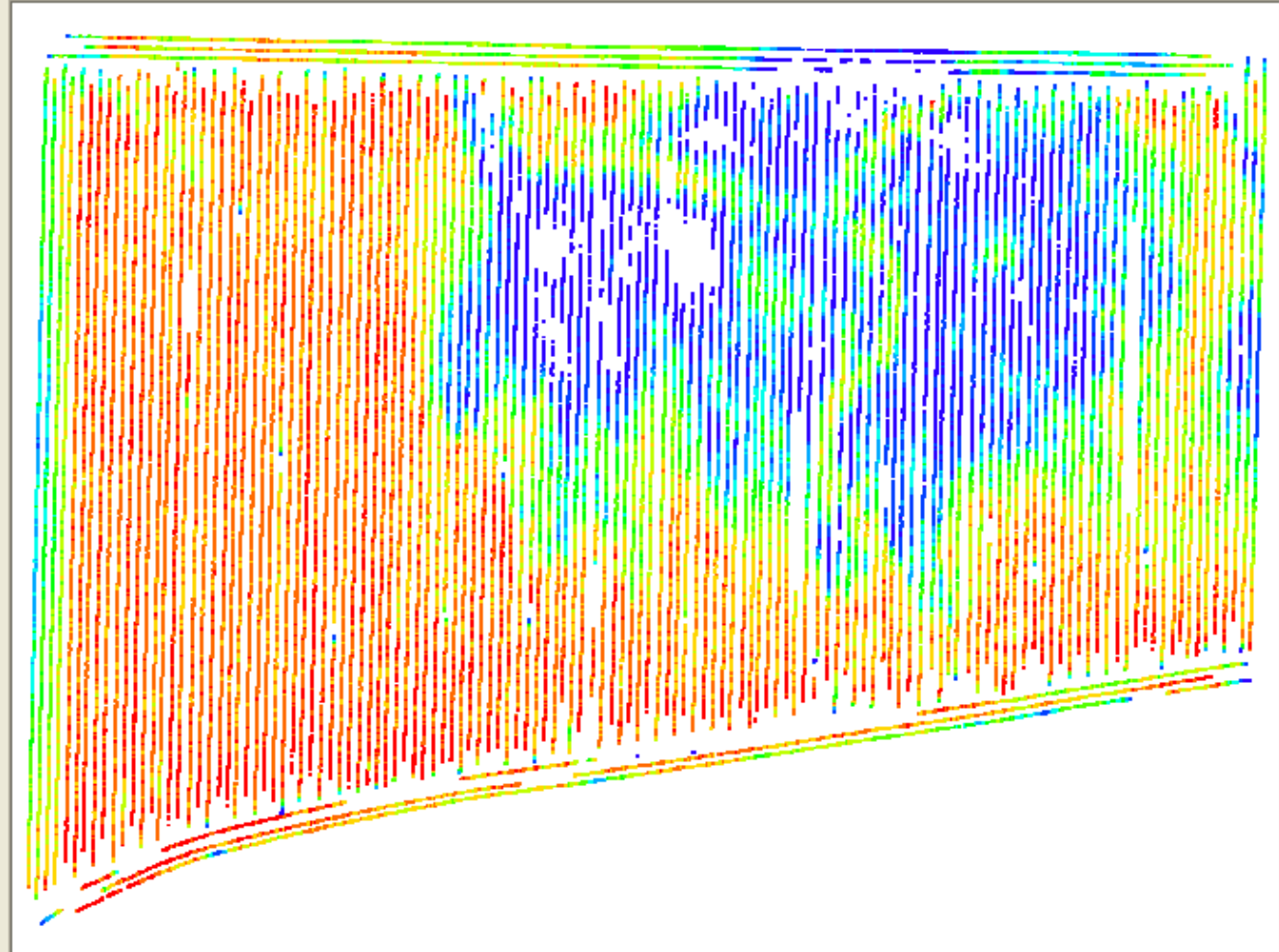
Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.31	71.20	48.0	34697	10-275
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Map and Easting 263532 Northing 4483617

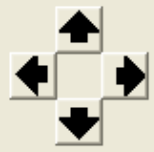
Unprocessed yield data

Nsecs	RmCode	Pass	Point



Zoom Tools

Manual Editing Tools



<< Advanced

Display Symbol Size (m) 1.25

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Flow Delay	642
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Moisture Delay	0
<input checked="" type="checkbox"/>	4	<input type="radio"/> Start Pass Delay	642
<input checked="" type="checkbox"/>	6	<input type="radio"/> End Pass Delay	324
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	274
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	6
<input type="checkbox"/>		<input checked="" type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	263276.99	264097.53	Manual Deletes
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Adjust for Moisture? Expand Dry?

15.5 Manual Moisture Setting

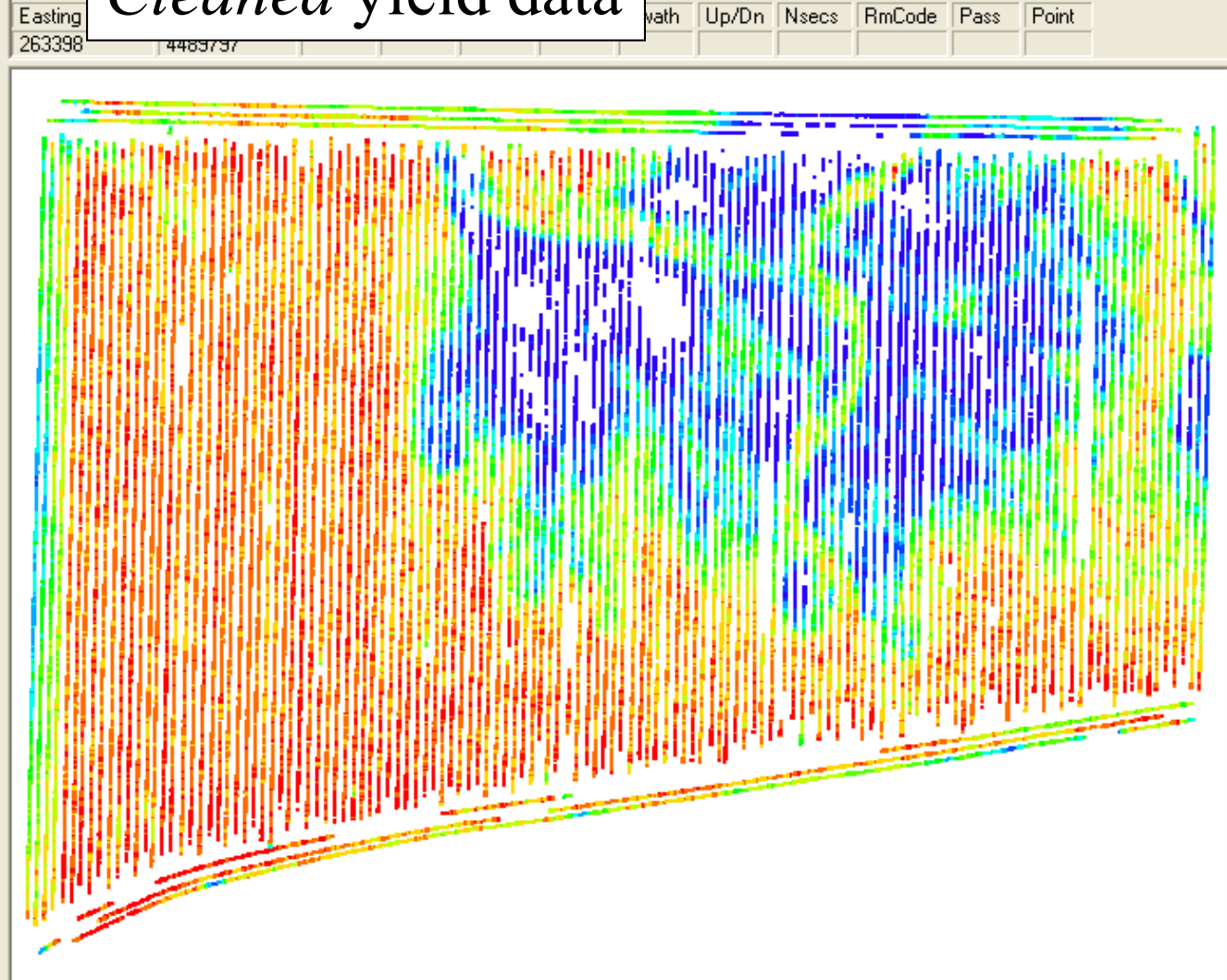
Sensor Based?

Yield Statistics

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Raw	152.78	75.64	49.5	37465	10-414

Map and

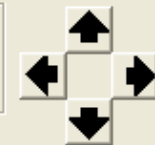
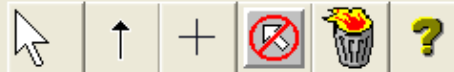
Cleaned yield data



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m)

1.5

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input type="checkbox"/>	-4	<input type="radio"/> Flow Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	0
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	952
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	165
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0
<input type="checkbox"/>	Position Filter	To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

<F10> Apply Filters

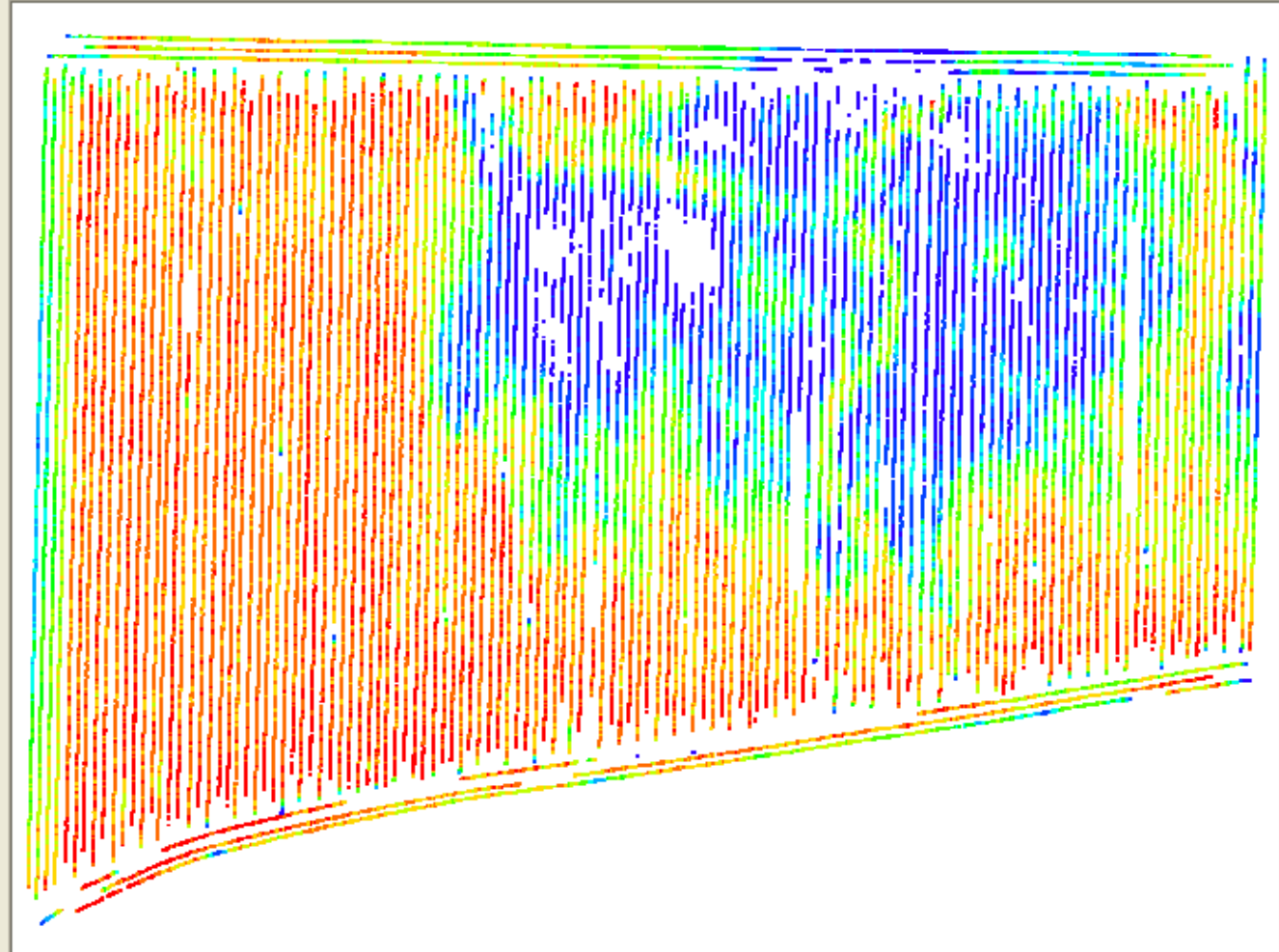
Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.31	71.20	48.0	34697	10-275
Raw	152.78	76.30	49.9	37465	10-414

Map and Easting 263532 4483617

Unprocessed yield data

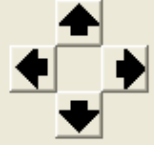
Nsecs	RmCode	Pass	Point



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m) 1.25

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Flow Delay	642
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Moisture Delay	0
<input checked="" type="checkbox"/>	4	<input type="radio"/> Start Pass Delay	642
<input checked="" type="checkbox"/>	6	<input type="radio"/> End Pass Delay	324
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	274
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	6
<input type="checkbox"/>		<input checked="" type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

Adjust for Moisture? Expand Dry?

15.5 Manual Moisture Setting

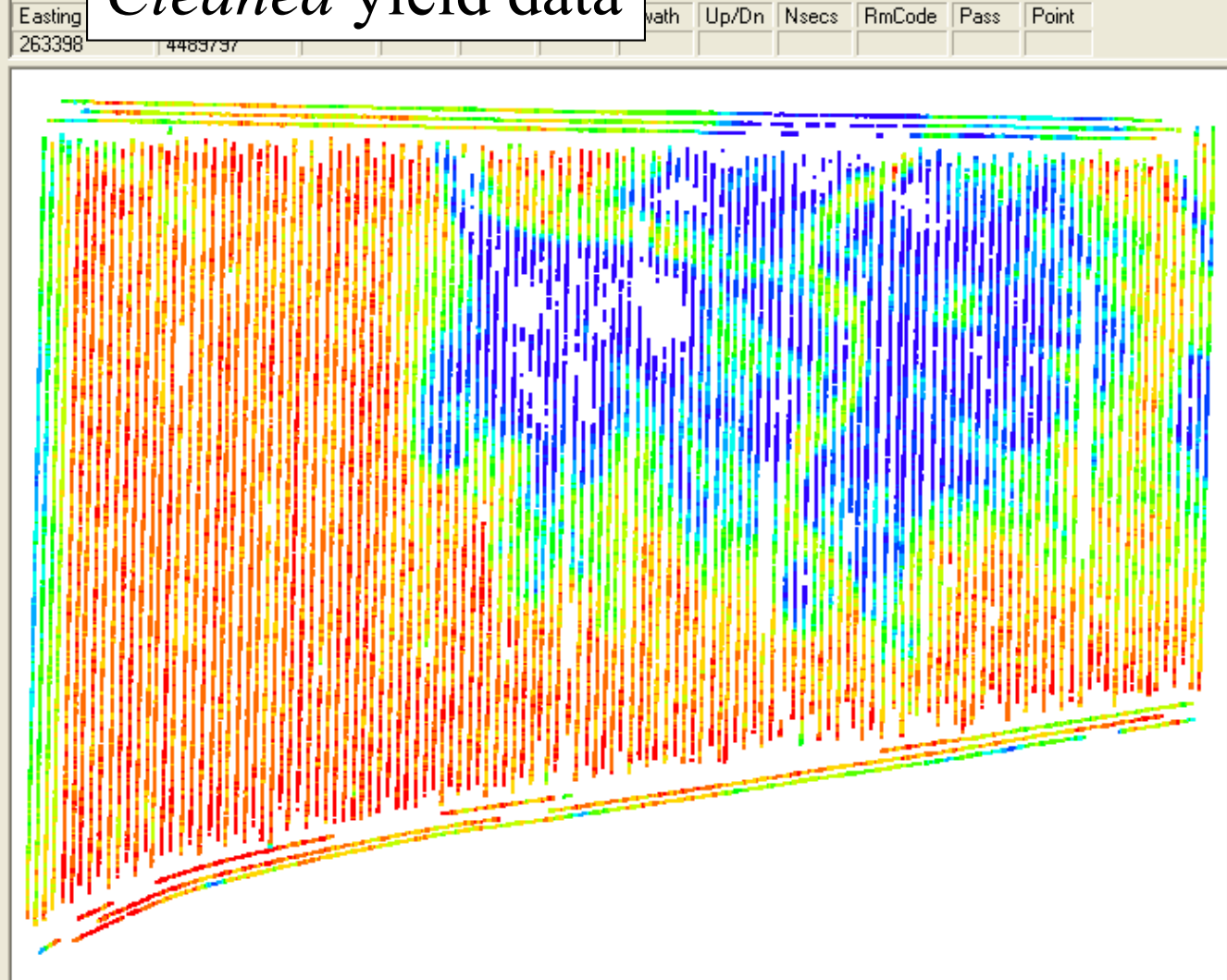
Sensor Based?

Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.86	71.13	47.8	34439	6-275
Raw	152.78	75.64	49.5	37465	10-414

Map and

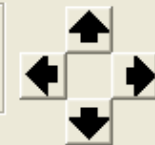
Cleaned yield data



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m)

1.5

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Flow Delay	642
<input checked="" type="checkbox"/>	-4	<input type="radio"/> Moisture Delay	0
<input checked="" type="checkbox"/>	4	<input type="radio"/> Start Pass Delay	642
<input checked="" type="checkbox"/>	6	<input type="radio"/> End Pass Delay	324
<input checked="" type="checkbox"/>	4.25	<input type="radio"/> Max Velocity (mph)	186
<input checked="" type="checkbox"/>	2.5	<input type="radio"/> Min Velocity (mph)	2394
<input checked="" type="checkbox"/>	0.05	<input type="radio"/> "Smooth" Velocity	1322
<input type="checkbox"/>	210	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	274
<input checked="" type="checkbox"/>	0	<input type="radio"/> Minimum Yield	0
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	6
<input type="checkbox"/>		<input checked="" type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	263276.99	264097.53	Manual Deletes
Northing	4489324.47	4489886.7	0

Adjust for Moisture? Expand Dry?

15.5 Manual Moisture Setting

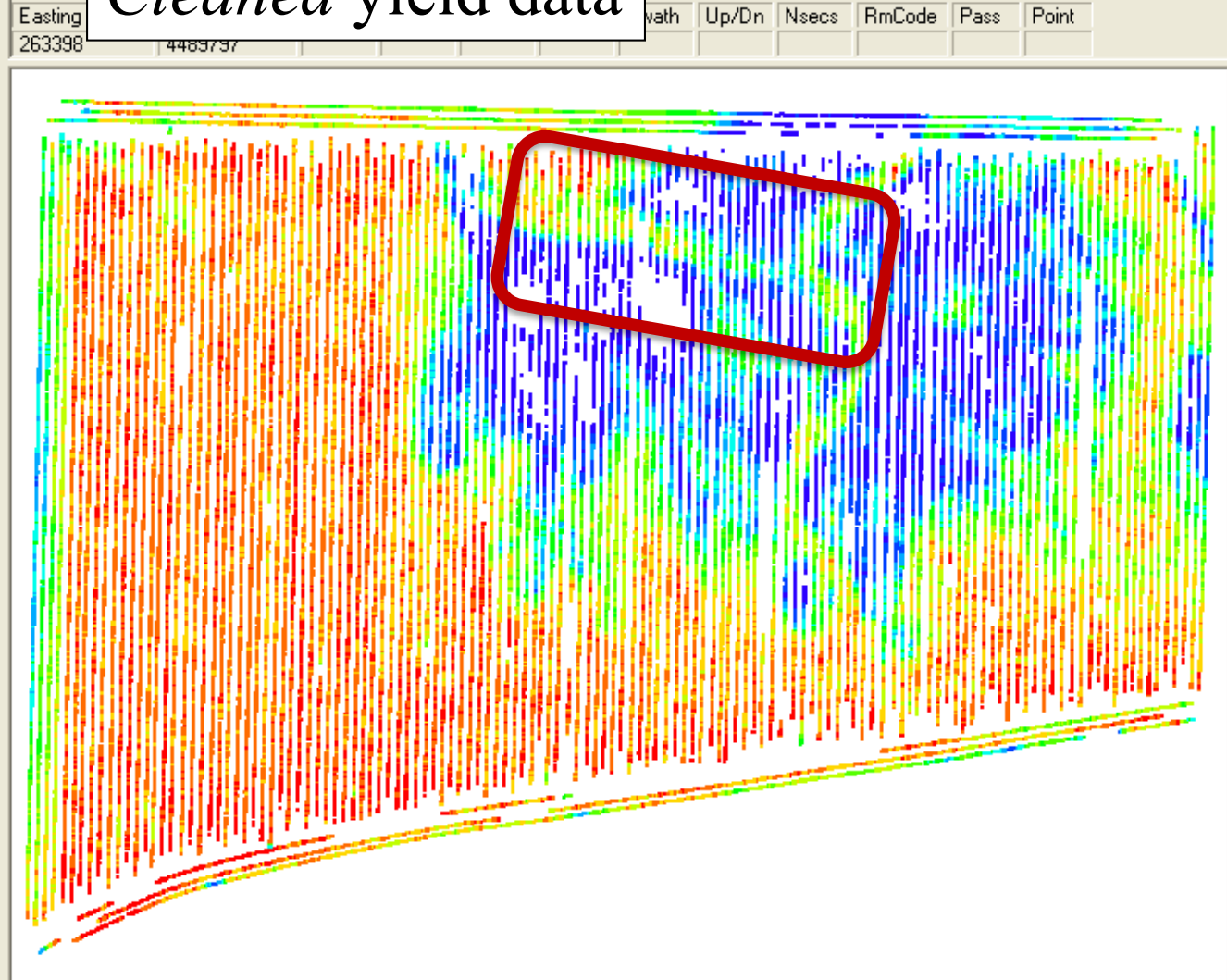
Sensor Based?

Yield Statistics

	Mean	STD	CV	N	Range
Clean	148.86	71.13	47.8	34439	6-275
Raw	152.78	75.64	49.5	37465	10-414

Map and

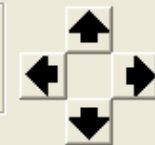
Cleaned yield data



Zoom Tools



Manual Editing Tools

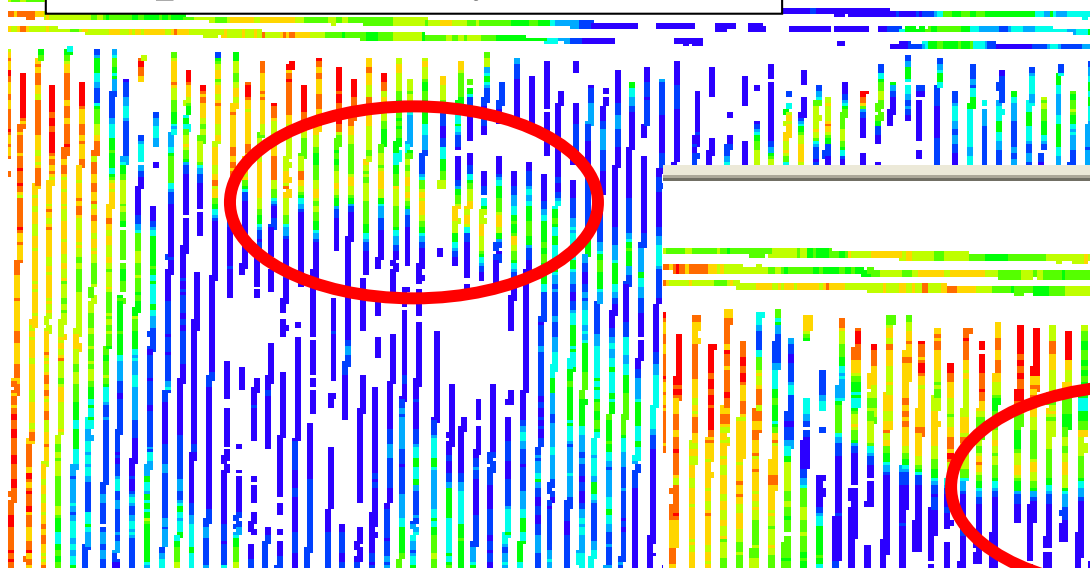


<< Advanced

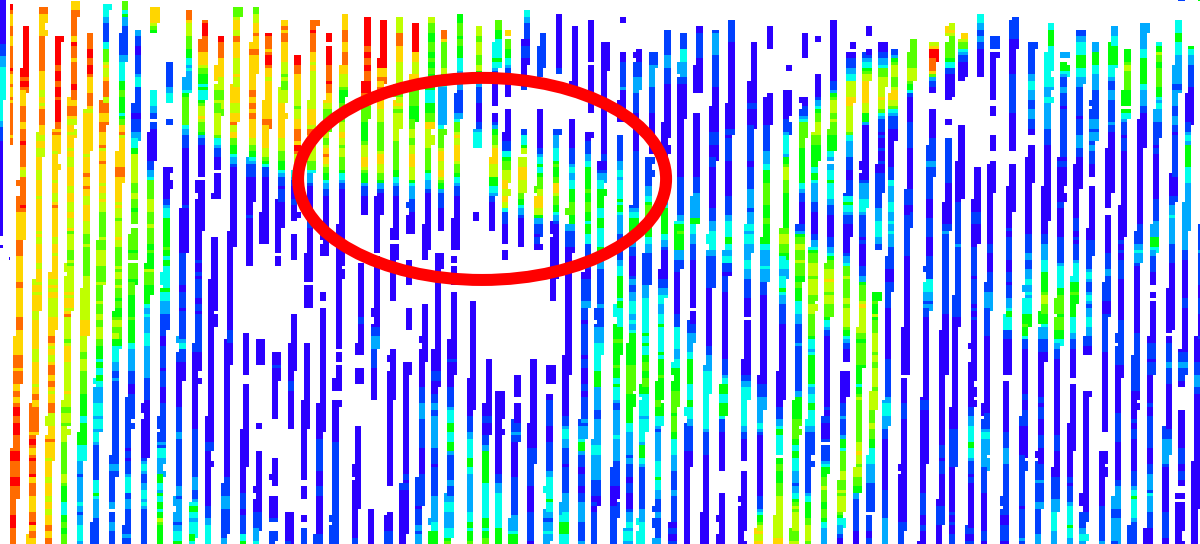
Display Symbol Size (m)

1.5

Unprocessed yield data



Flow delay set



Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted		
<input type="checkbox"/>	0	<input type="radio"/> Flow Delay	<input type="text" value="0"/>	
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	<input type="text" value="0"/>	
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	<input type="text" value="0"/>	
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	<input type="text" value="0"/>	
<input type="checkbox"/>	7	<input type="radio"/> Max Velocity (mph)	<input type="text" value="0"/>	
<input type="checkbox"/>	2	<input type="radio"/> Min Velocity (mph)	<input type="text" value="0"/>	
<input type="checkbox"/>	0.2	<input type="radio"/> "Smooth" Velocity	<input type="text" value="0"/>	
<input type="checkbox"/>	120	<input type="radio"/> Minimum Swath (in)	<input type="text" value="0"/>	
<input type="checkbox"/>	250	<input type="radio"/> Maximum Yield	<input type="text" value="0"/>	
<input type="checkbox"/>	0	<input type="radio"/> Minimum Yield	<input type="text" value="0"/>	
<input type="checkbox"/>	4	<input type="radio"/> STD Filter	<input type="text" value="0"/>	
<input type="checkbox"/>		<input type="radio"/> Header Down Req	<input type="text" value="0"/>	
<input type="checkbox"/>	Position Filter	To	<input type="text" value="0"/>	
	Easting	<input type="text" value="625575.75"/>	<input type="text" value="626414.29"/>	Manual Deletes
	Northing	<input type="text" value="4266068.27"/>	<input type="text" value="4266939.6"/>	<input type="text" value="0"/>
<input type="checkbox"/>	Adjust for Moisture?			

<F10>
Apply Filters

Yield Statistics

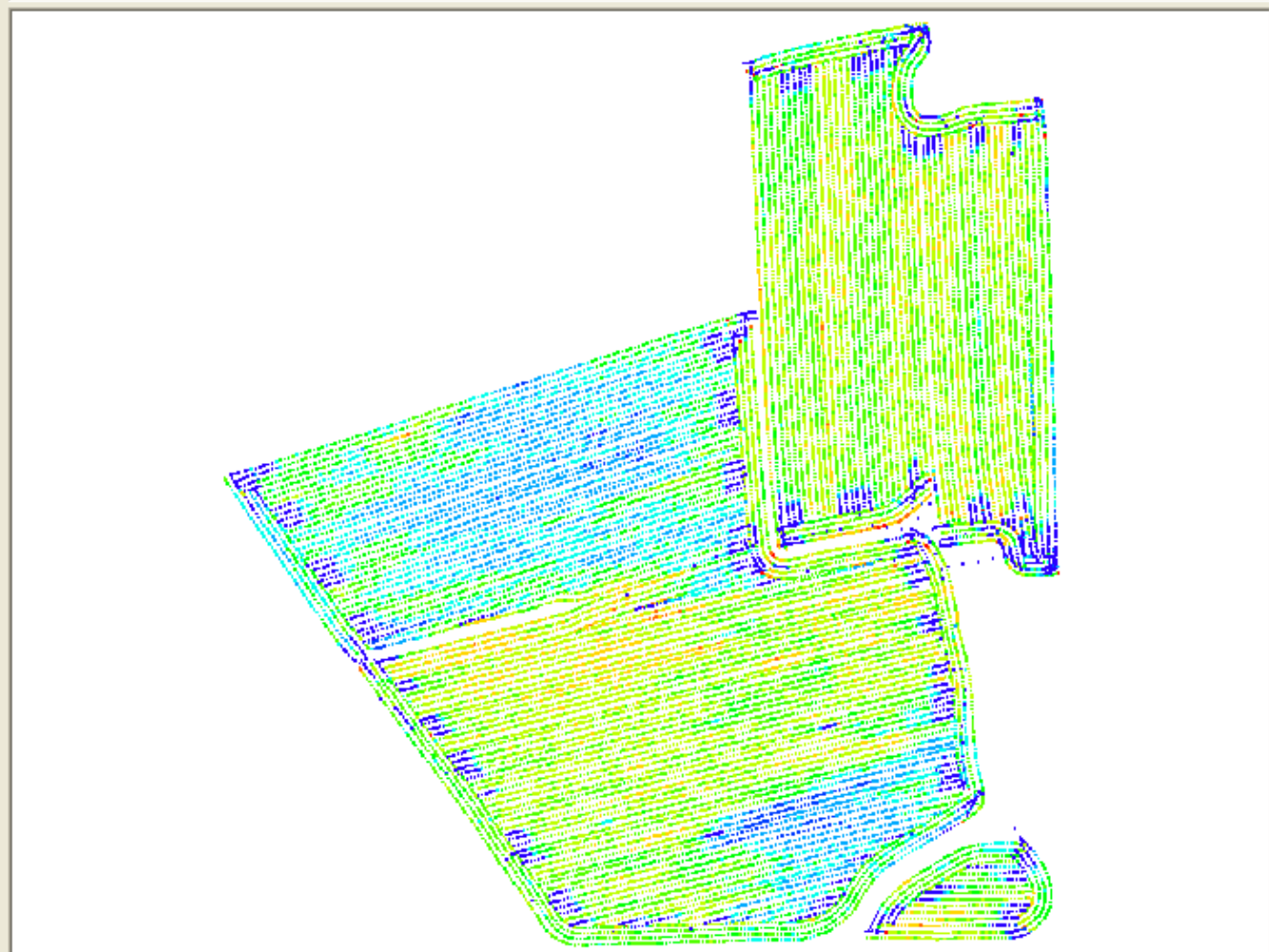
	Mean	STD	CV	N	Range
Clean	182.14	71.43	39.2	19279	0-419
Raw	182.14	71.43	39.2	19279	0-419

Map and

Easting 626407
Northing 4266407

Unprocessed yield data

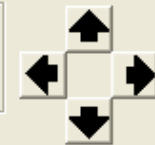
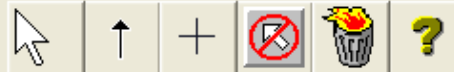
Nsecs	RmCode	Pass	Point



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m)
1.25

Load/Import File

Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input checked="" type="checkbox"/>	8	<input type="radio"/> Flow Delay	1934
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0
<input checked="" type="checkbox"/>	8	<input type="radio"/> Start Pass Delay	1934
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0
<input checked="" type="checkbox"/>	7	<input type="radio"/> Max Velocity (mph)	32
<input checked="" type="checkbox"/>	3.5	<input type="radio"/> Min Velocity (mph)	958
<input checked="" type="checkbox"/>	0.2	<input type="radio"/> "Smooth" Velocity	514
<input type="checkbox"/>	120	<input type="radio"/> Minimum Swath (in)	0
<input checked="" type="checkbox"/>	275	<input type="radio"/> Maximum Yield	438
<input checked="" type="checkbox"/>	50	<input type="radio"/> Minimum Yield	2005
<input checked="" type="checkbox"/>	3	<input type="radio"/> STD Filter	2056
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0
<input type="checkbox"/> Position Filter		To	0
Easting	625575.75	626414.29	Manual Deletes
Northing	4266068.27	4266939.6	0
<input type="checkbox"/> Adjust for Moisture?			

<F10>
Apply Filters

Yield Statistics

	Mean	STD	CV	N	Range
Clean	196.89	50.49	25.6	14903	51-275
Raw	182.14	452.8	248.6	19279	0-419

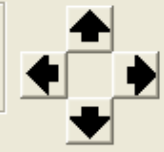
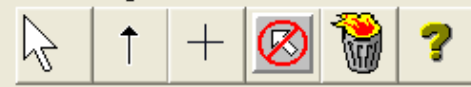
Cleaned yield data



Zoom Tools



Manual Editing Tools



<< Advanced

Display Symbol Size (m)
1.25

Questions?

Yield Editor

Load/Import File **Filtering, Mapping and Editing** Save/Export File

Filter Selection

Use?	Show?	Deleted	
<input type="checkbox"/>	15	<input type="radio"/> Flow Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	0
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0
<input type="checkbox"/>	6.4	<input type="radio"/> Max Velocity (mph)	0
<input type="checkbox"/>	1.9	<input type="radio"/> Min Velocity (mph)	0
<input type="checkbox"/>	0.2	<input type="radio"/> "Smooth" Velocity	0
<input type="checkbox"/>	120	<input type="radio"/> Minimum Swath (in)	0
<input type="checkbox"/>	178	<input type="radio"/> Maximum Yield	0
<input type="checkbox"/>	1	<input checked="" type="radio"/> Minimum Yield	0
<input type="checkbox"/>	4	<input type="radio"/> STD Filter	0
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0
<input type="checkbox"/>		<input type="radio"/> Overlap (Auto)	0
<input type="checkbox"/>		<input type="radio"/> Local STD (Auto)	0

Position Filter To: 2

Easting: 411132.33 411883.89 Manual Deletes

Northing: 4244985.56 4245768.21 0

Adjust for Moisture?

<F10> Apply Filters

Map and Manual Editor

Easting (m)	Northing (m)	Yield	Flow	Speed	Moist	Swath	Up/Dn	Nsecs	RmCode	Pass	Point
412065	4245257	72.42	2.70	0.68	13.0	348	1	1.0	0	31	175

Yield Statistics

	Mean	STD	CV	N	Range
Clean	43.48	20.06	46.1	29641	0-225
Raw	43.48	20.06	46.1	29643	0-225

Zoom Tools **Manual Editing Tools**

<< Advanced

Display Legend? Symbol Size (m) 1.25

Legend

Color	Value
Red	225.3
Orange	202.8
Yellow	180.2
Light Green	157.7
Green	135.2
Light Blue	112.7
Blue	90.1
Dark Blue	67.6
Very Dark Blue	45.1
Black	22.5

Display

- Yield
- Moisture
- Velocity
- Flow
- Swath
- Overlap

Classes

- Eq Intervals
- Eq Obs



Yield Editor

Load/Import File **Filtering, Mapping and Editing** Save/Export File

Filter Selection

Use?	Show?	Deleted		
<input type="checkbox"/>	15	<input type="radio"/> Flow Delay	0	
<input type="checkbox"/>	0	<input type="radio"/> Moisture Delay	0	
<input type="checkbox"/>	0	<input type="radio"/> Start Pass Delay	0	
<input type="checkbox"/>	0	<input type="radio"/> End Pass Delay	0	
<input type="checkbox"/>	6.4	<input type="radio"/> Max Velocity (mph)	0	
<input type="checkbox"/>	1.9	<input type="radio"/> Min Velocity (mph)	0	
<input type="checkbox"/>	0.2	<input type="radio"/> "Smooth" Velocity	0	
<input type="checkbox"/>	120	<input type="radio"/> Minimum Swath (in)	0	
<input type="checkbox"/>	178	<input type="radio"/> Maximum Yield	0	
<input type="checkbox"/>	1	<input type="radio"/> Minimum Yield	0	
<input type="checkbox"/>	4	<input type="radio"/> STD Filter	0	
<input type="checkbox"/>		<input type="radio"/> Header Down Req	0	
<input type="checkbox"/>		<input type="radio"/> Overlap (Auto)	0	
<input type="checkbox"/>		<input type="radio"/> Local STD (Auto)	0	
<input checked="" type="checkbox"/>	Position Filter	To	2	
	Easting	411132.33	411883.89	Manual Deletes
	Northing	4244985.56	4245768.21	0

Adjust for Moisture?

<F10> Apply Filters

Map and Manual Editor

Easting (m)	Northing (m)	Yield	Flow	Speed	Moist	Swath	Up/Dn	Nsecs	RmCode	Pass	Point
412065	4245257	72.42	2.70	0.68	13.0	348	1	1.0	0	31	175

Yield Statistics

	Mean	STD	CV	N	Range
Clean	43.48	20.06	46.1	29641	0-225
Raw	43.48	20.06	46.1	29643	0-225

Zoom Tools:

Manual Editing Tools:

Display Legend? Symbol Size (m) 1.25

<< Advanced

Bring, Send, Select, Alt Text, Accessibility

Legend

Color	Value
Red	16.4
Orange	15.8
Yellow	15.1
Light Green	14.4
Green	13.7
Cyan	13.1
Blue	12.4
Light Blue	11.7
Dark Blue	11.0
Very Dark Blue	10.3

Display

- Yield
- Moisture
- Velocity
- Flow
- Swath
- Overlap

Classes

- Eq Intervals
- Eq Obs



Yield Editor

Load/Import File **Filtering, Mapping and Editing** Save/Export File

Filter Selection

Use?	Show?	Deleted		
<input type="checkbox"/>	15	Flow Delay	0	
<input type="checkbox"/>	0	Moisture Delay	0	
<input type="checkbox"/>	0	Start Pass Delay	0	
<input type="checkbox"/>	0	End Pass Delay	0	
<input type="checkbox"/>	6.4	Max Velocity (mph)	0	
<input type="checkbox"/>	1.9	Min Velocity (mph)	0	
<input type="checkbox"/>	0.2	"Smooth" Velocity	0	
<input type="checkbox"/>	120	Minimum Swath (in)	0	
<input type="checkbox"/>	178	Maximum Yield	0	
<input type="checkbox"/>	1	Minimum Yield	0	
<input type="checkbox"/>	4	STD Filter	0	
<input type="checkbox"/>		Header Down Req	0	
<input type="checkbox"/>		Overlap (Auto)	0	
<input type="checkbox"/>		Local STD (Auto)	0	
<input checked="" type="checkbox"/>	Position Filter	To	2	
	Easting	411132.33	411883.89	Manual Deletes
	Northing	4244985.56	4245768.21	0

Adjust for Moisture?

<F10> Apply Filters

Map and Manual Editor

Easting (m)	Northing (m)	Yield	Flow	Speed	Moist	Swath	Up/Dn	Nsecs	RmCode	Pass	Point
412065	4245257	72.42	2.70	0.68	13.0	348	1	1.0	0	31	175

Yield Statistics

	Mean	STD	CV	N	Range
Clean	43.48	20.06	46.1	29641	0-225
Raw	43.48	20.06	46.1	29643	0-225

Zoom Tools: [Home] [Pan] [Zoom In] [Zoom Out]

Manual Editing Tools: [Select] [Move] [Add] [Delete] [Erase] [Help]

Display Legend? Symbol Size (m) 1.25

Bring Forward Send Backward Select

Alt Text Accessibility

Legend

Color	Value
Red	6.1
Orange	5.7
Yellow	5.3
Light Green	4.9
Green	4.5
Cyan	4.1
Blue	3.7
Dark Blue	3.3
Dark Blue	2.9
Dark Blue	2.5

Display

- Yield
- Moisture
- Velocity
- Flow
- Swath
- Overlap

Classes

- Eq Intervals
- Eq Obs

AYCE - Automated Yield Cleaning Expert

Delay Computations

Auto flow delay computation?

Auto moisture delay computation?

Bitmap based overlap filter

Perform Overlap Filter

50 % Overlap Limit

0.3 Cellsize (m)

Localized STD filter

Perform STD filter

3 STD Limit

5 Header Widths

Auto Min/Max Filter

Use Auto Min/Max Filters?

Yield?

Yield	Min	Max
	1	178

Position?

Min	Max
Easting	573051 573687
Northing	4342635 4343094

Velocity?

Min	Max
Velocity	1.92 6.39

Automated filters complete.

Run Auto Filters

R²C vs Flow Delay (intervals)

R²C vs Moisture Delay (intervals)

Load/Import File

Filtering, Mapping and Editing

Save/Export File

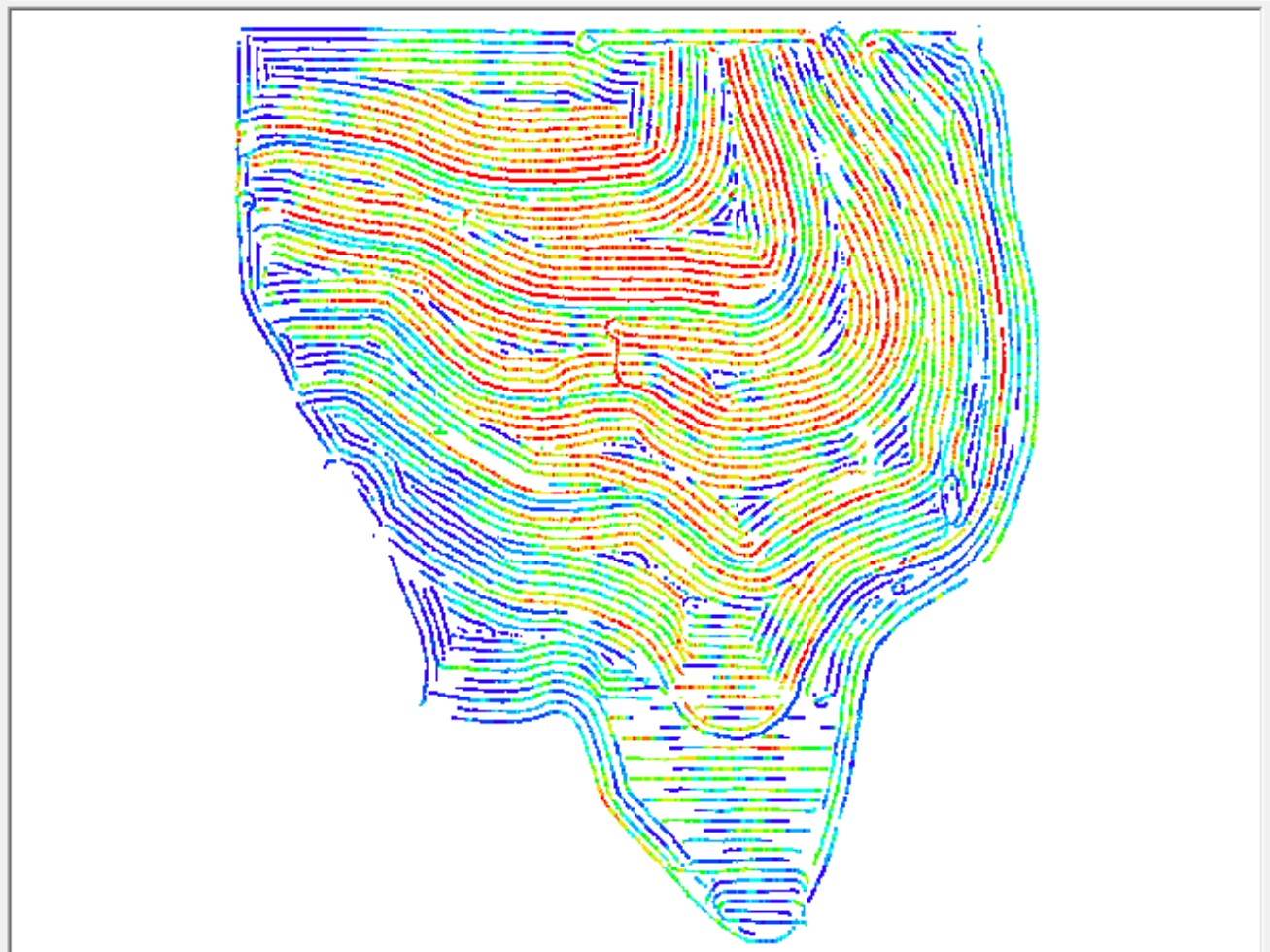
Filter Selection

Use?	Show?	Deleted
<input checked="" type="checkbox"/>	13	Flow Delay 839
<input type="checkbox"/>	0	Moisture Delay 0
<input type="checkbox"/>	0	Start Pass Delay 0
<input type="checkbox"/>	0	End Pass Delay 0
<input checked="" type="checkbox"/>	6.9	Max Velocity (mph) 17
<input checked="" type="checkbox"/>	2.7	Min Velocity (mph) 899
<input type="checkbox"/>	0.2	"Smooth" Velocity 0
<input type="checkbox"/>	120	Minimum Swath (in) 0
<input checked="" type="checkbox"/>	109	Maximum Yield 73
<input checked="" type="checkbox"/>	1	Minimum Yield 845
<input type="checkbox"/>	4	STD Filter 0
<input type="checkbox"/>		Header Down Req 0
		Overlap (Auto) 2830
		Local STD (Auto) 407
<input checked="" type="checkbox"/>	Position Filter	To 0
	Easting	411116 411912 Manual Deletes
	Northing	4244971 4245802 0
<input type="checkbox"/>	Adjust for Moisture?	

<F10>
Apply Filters

Map and Manual Editor

Easting (m)	Northing (m)	Yield	Flow	Speed	Moist	Swath	Up/Dn	Nsecs	RmCode	Pass	Point
411171	4244982										



Yield Statistics

	Mean	STD	CV	N	Range
Clean	44.63	20.16	45.2	25309	4-108
Raw	43.48	22.64	52.1	29643	0-225

Zoom Tools

Manual Editing Tools

Display Legend?

Symbol Size (m)

<< Advanced

Load/Import File

Filtering, Mapping and Editing

Save/Export File

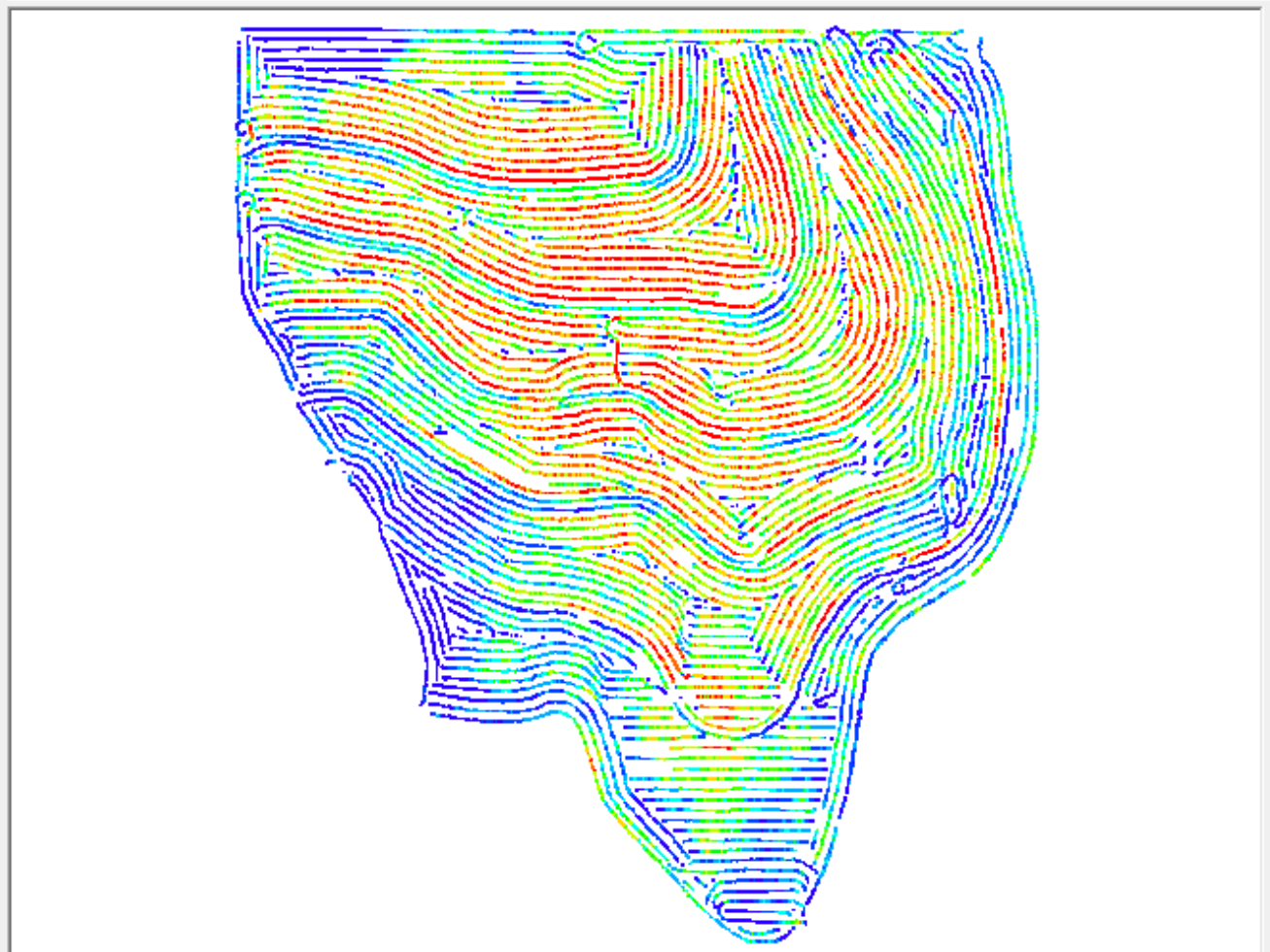
Filter Selection

Use?	Show?	Deleted
<input checked="" type="checkbox"/>	-2	Flow Delay 132
<input type="checkbox"/>	0	Moisture Delay 0
<input type="checkbox"/>	0	Start Pass Delay 0
<input type="checkbox"/>	0	End Pass Delay 0
<input checked="" type="checkbox"/>	6.9	Max Velocity (mph) 17
<input checked="" type="checkbox"/>	2.7	Min Velocity (mph) 899
<input type="checkbox"/>	0.2	"Smooth" Velocity 0
<input type="checkbox"/>	120	Minimum Swath (in) 0
<input checked="" type="checkbox"/>	109	Maximum Yield 11
<input checked="" type="checkbox"/>	1	Minimum Yield 138
<input type="checkbox"/>	4	STD Filter 0
<input type="checkbox"/>		Header Down Req 0
		Overlap (Auto) 2830
		Local STD (Auto) 407
<input checked="" type="checkbox"/>	Position Filter	To 0
	Easting	411116 To 411912 Manual Deletes
	Northing	4244971 To 4245802 0
<input type="checkbox"/>	Adjust for Moisture?	

<F10>
Apply Filters

Map and Manual Editor

Easting (m)	Northing (m)	Yield	Flow	Speed	Moist	Swath	Up/Dn	Nsecs	RmCode	Pass	Point
412084	4245689										

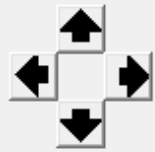


Yield Statistics

	Mean	STD	CV	N	Range
Clean	46.25	18.64	40.3	25804	4-109
Raw	43.48	20.27	46.6	29643	0-225

Zoom Tools

Manual Editing Tools

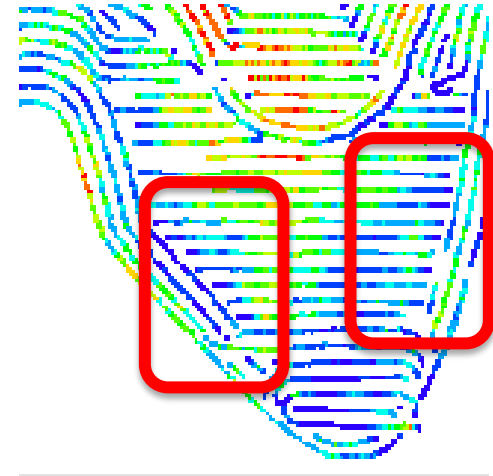
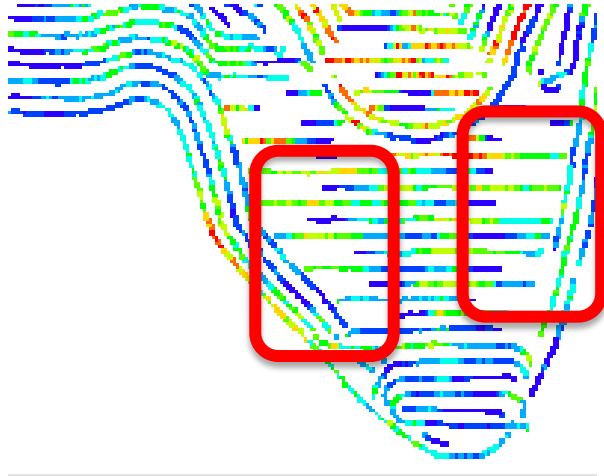


Display Legend?

Symbol Size (m)
1.25

<< Advanced

Farm Data Quality Litmus



Limited gaps near headlands: “holes in data”

Export Data

Select Output Fields

- UTM Easting (m)
- UTM Northing (m)
- Longitude (DD)
- Latitude (DD)
- Yield
- Moisture (%)
- Swath Width (in)
- Travel Distance (in)
- Grain Flow (lb/s)
- Interval Length (s)
- AGL Flag Code
- Transect Number
- GPS Time
- UTM Zone
- RmCode

Formatting

- Comma Delimited ASCII
- Space Delimited ASCII
- Allow Negative Lat/Long?

Point Types to Export

- Export CLEAN points?
- Export SELECTED points?
- Export DELETED points?
- Export ALL points?

Export Data

Save Filter and Configuration Settings

Save Config

- Save as Default Configuration?

Save Current Yield Editor Session


Session Log and Notes

```
<< 08-24-2020 11:10:30 IMPORTED FROM <- C:\Program Files (x86)\Yield_Editor\samples\sample1.txt >>
<< 08-24-2020 11:10:42 IMPORTED FROM <- C:\Program Files (x86)\Yield_Editor\samples\sample1.txt >>
```

Save Session

Practical Application

- ‘Cleaning’ yield data important for decision making
- Skilled analysts take 30-45 minutes to clean each yield data set
- Transferring the task from an analyst to algorithm improves probability of technology adoption
 - From ‘active’ to ‘passive’ processes
- Yield monitor data that has been properly processed to remove extraneous points are useful to identify sub-field management areas that may benefit from more detailed targeted analysis
- Improving quality of yield monitor data may necessitate different behavior of combine harvester operator

- 
- Yield monitor data has value
 - Data quality is important
 - USDA ARS Yield Editor very good tool
 - Depends how you use the data
 - “Small data” is first step
 - Sound management decisions requires yield monitor data to be cleaned of erroneous measurements

The basic question: $B > C?$



Questions?

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