Research Updates

2016 Roadside Vegetation Management Conference

State College, PA

Alternatives to Embark 2S for Plant Growth Regulation of Roadside Turf

2015 & 2016

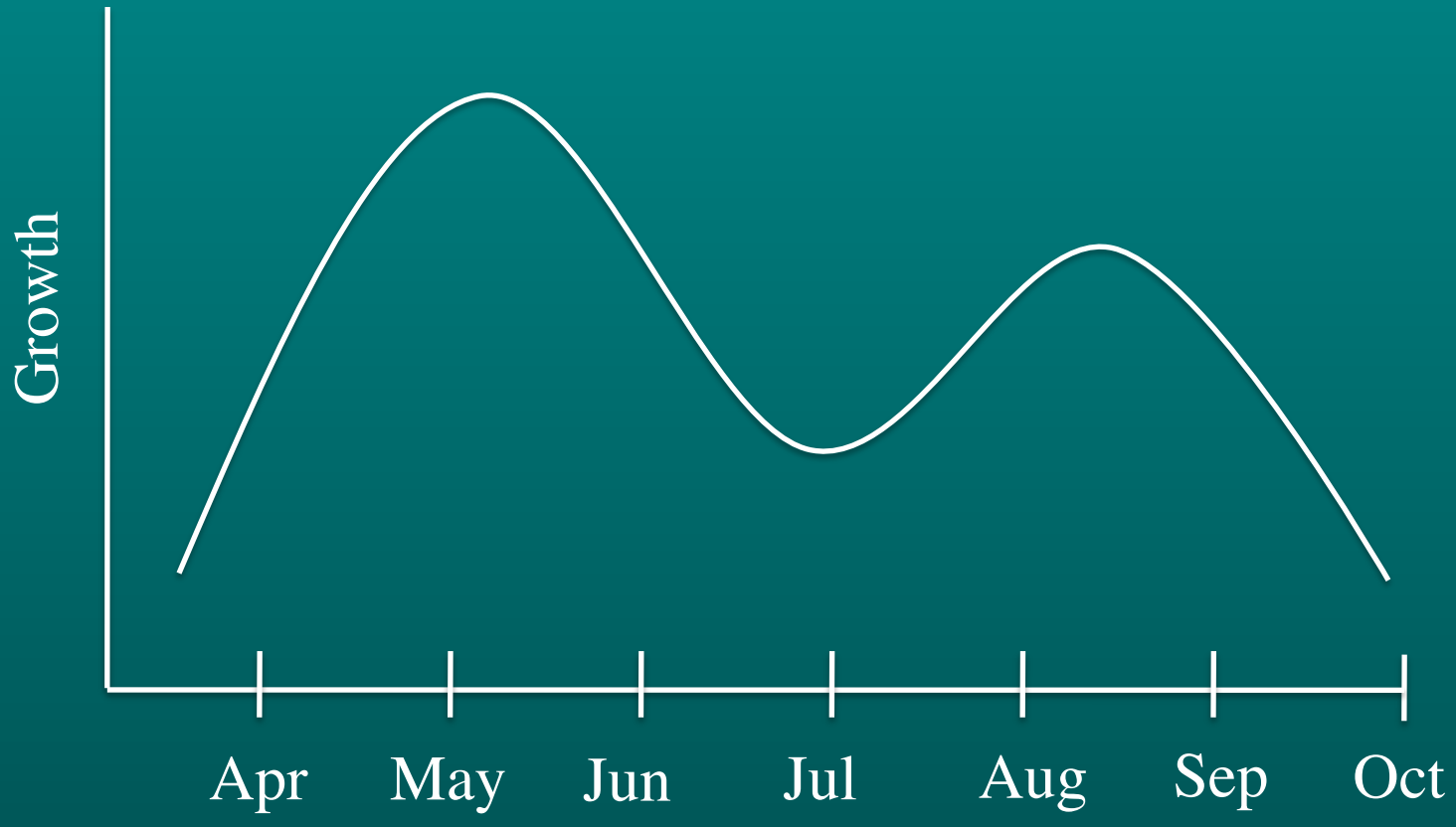
Experiments

PGR Program Objectives

- Reduce mowing cycles
- Reduce maintenance in difficult settings
  - slopes planted to Formula D
    - tall fescue (*Lolium arundinaceum (Schreb.)*)
    - creeping red fescue (*Festuca rubra L.*)
  - islands
  - cable guiderails


EXIT 2
Eighth
Avenue
EXIT 1 MILE
8:50 MAY/26/2015

Turf Growth



Seasonal growth pattern of cool-season perennial grasses.


Target time to treat:
'when turf looks like you want it to look'
MAY 5 2004


Prevent seedhead emergence at boot stage

Standard PennDOT Turf Growth Regulator Treatment

Products	Application Rate oz/ac
Embark 2S Escort XP	6 0.2

*Treatment includes a broadleaf component plus surfactant

- **In April 2015, PBI-Gordon announced mefluidide would no longer be available.**

Objective

To identify an acceptable substitute for mefluidide from products available on the market.

product	oz/ac
untreated	---
Plateau Method	2 5
Panoramic Method	2 5
Embark Escort XP Method	6 0.2 5
Segment Method	24 5
Anuew Method	21.8 5
Escort XP Method	0.33 5
Plateau Escort XP Method	2 0.2 5

All treatments listed also evaluated using Milestone VM substituted for Method, except last one.

Milestone 5 oz/ac

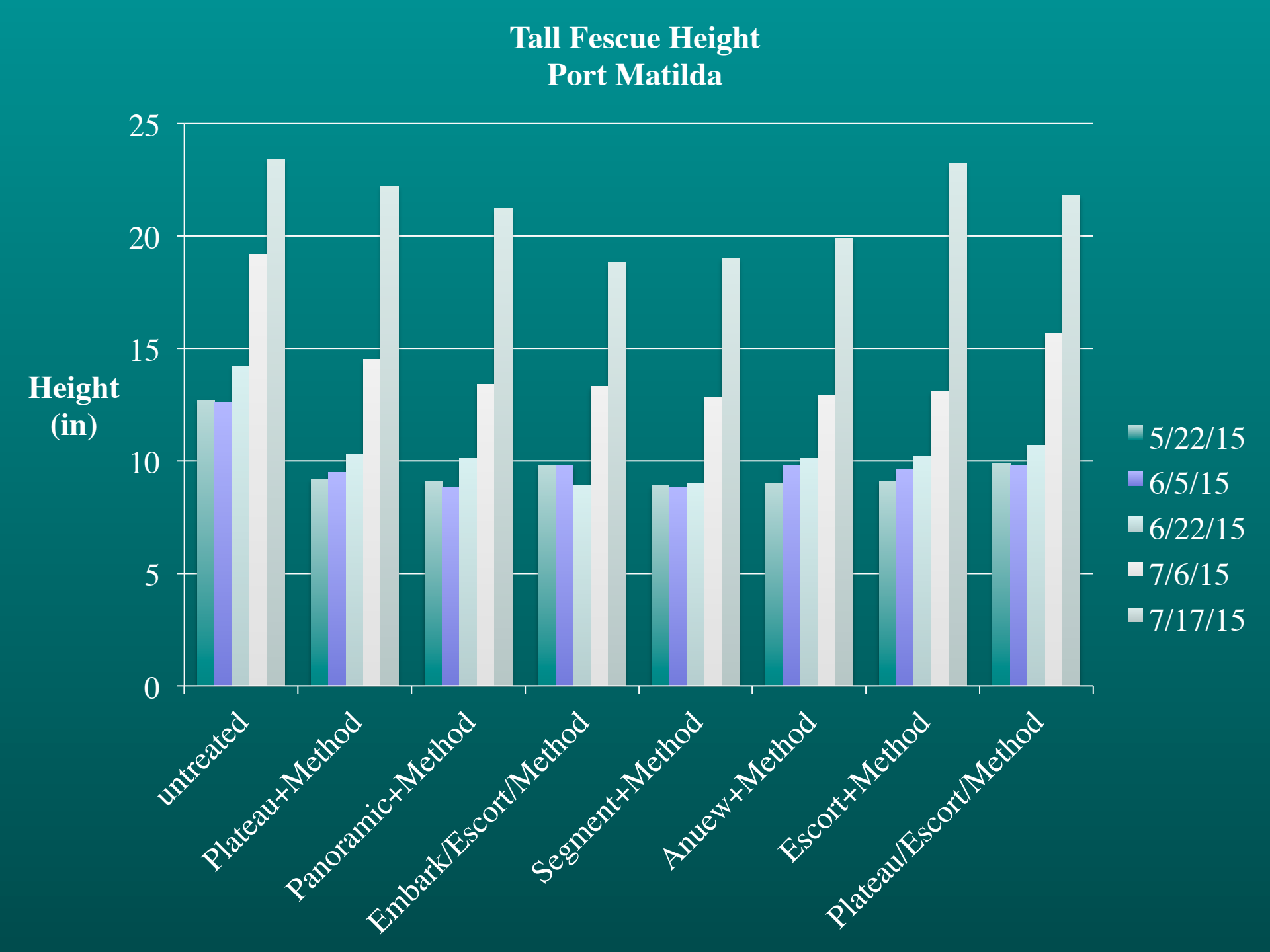

Three experimental sites established in 2015
* Port Matilda
* Pleasant Gap
* Innovation Park
2015/05/07

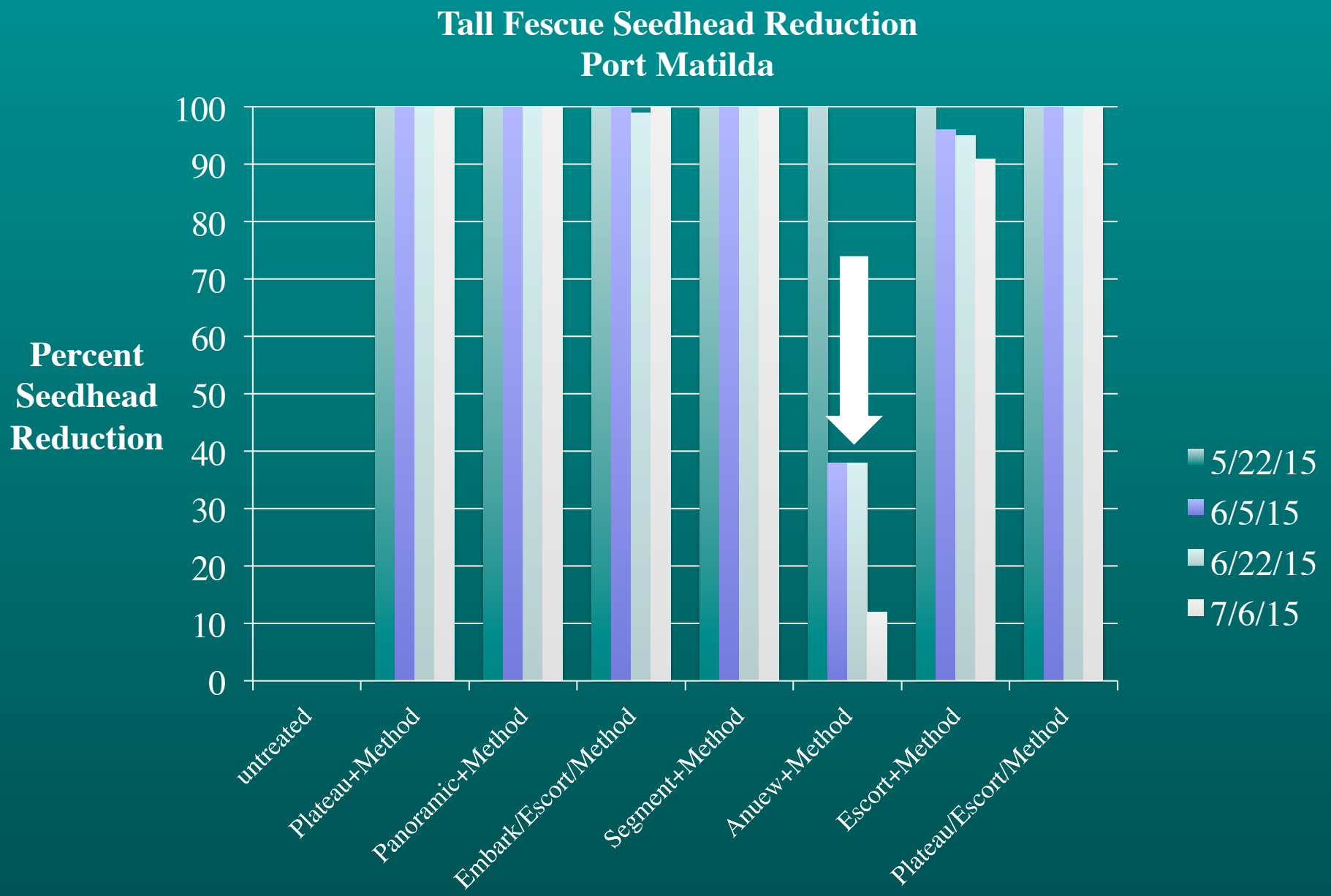
Experimental Sites

- Treatments applied May 6 to 11, 2015.
- Evaluated at 2 week intervals
- Induce non-ionic surfactant added to all treatments @ 0.25% v/v.
- Applied with CO_2 backpack sprayer equipped with 6 ft. boom and (4) 8003 VS tips.
- 6 x 15-25 ft. plots, 4 reps
- 35 GPA

Data Collected

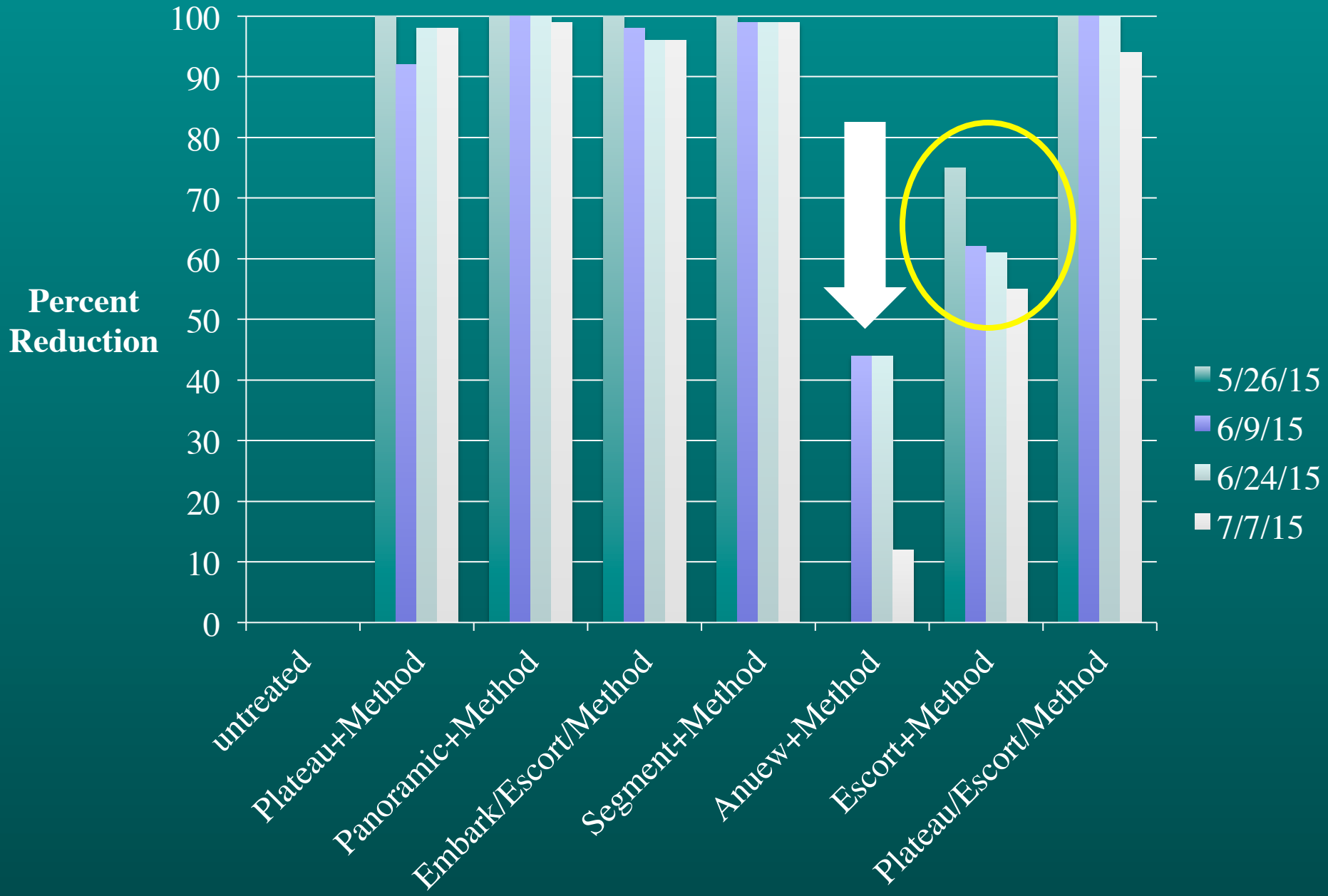
- Turf Height
  - blade length
- Seedhead Reduction
  - percent seedheads visibly absent for species
- Turf Phytotoxicity
  - scale (0-10)
- Turf Cover
- Broadleaf Weed Control


Tall Fescue Height
Port Matilda
Height (in)
25
20
15
10
5
0
5/22/15
6/5/15
6/22/15
7/6/15
7/17/15
untreated
Plateau+Method
Panoramic+Method
Embark/Escort/Method
Segment+Method
Anuew+Method
Escort+Method
Plateau/Escort/Method

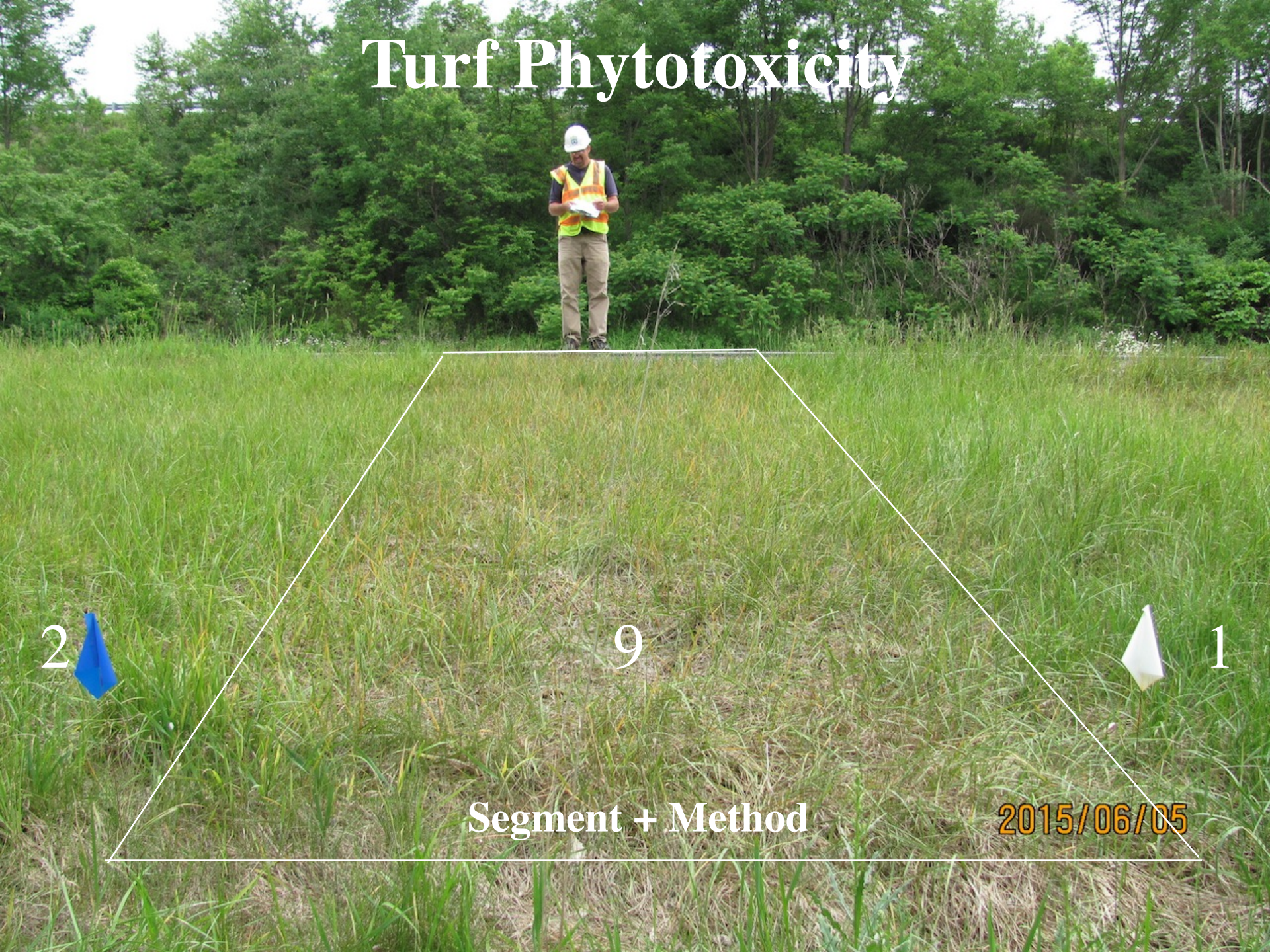

Tall Fescue Seedhead Reduction
Port Matilda
Percent Seedhead Reduction
100
90
80
70
60
50
40
30
20
10
0
untreated
Plateau+Method
Panoramic+Method
Embark/Escort/Method
Segment+Method
Anuew+Method
Escort+Method
Plateau/Escort/Method
5/22/15
6/5/15
6/22/15
7/6/15

Seedhead Reduction

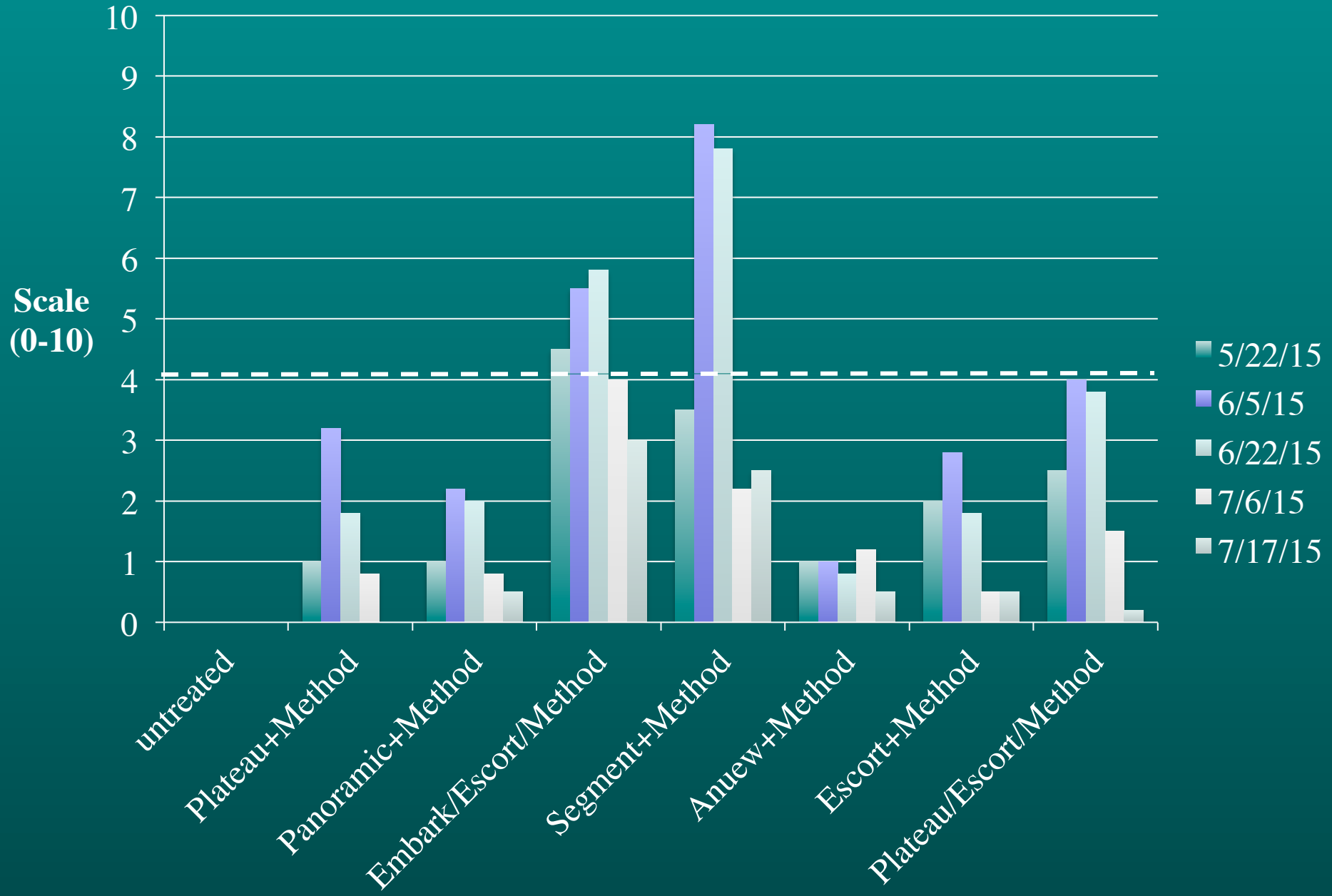
Tall Fescue Seedhead Reduction
Pleasant Gap



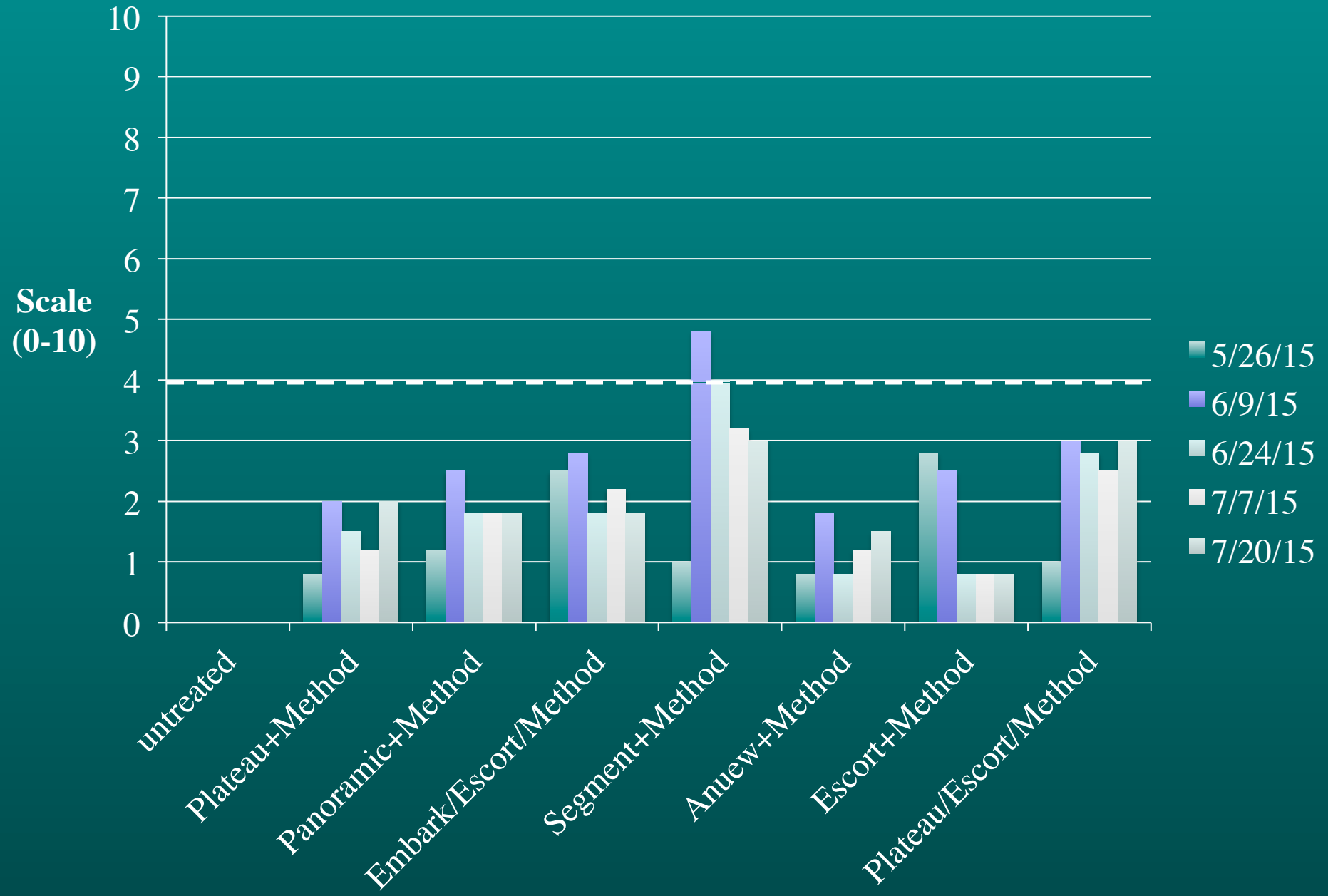
Turf Phytotoxicity



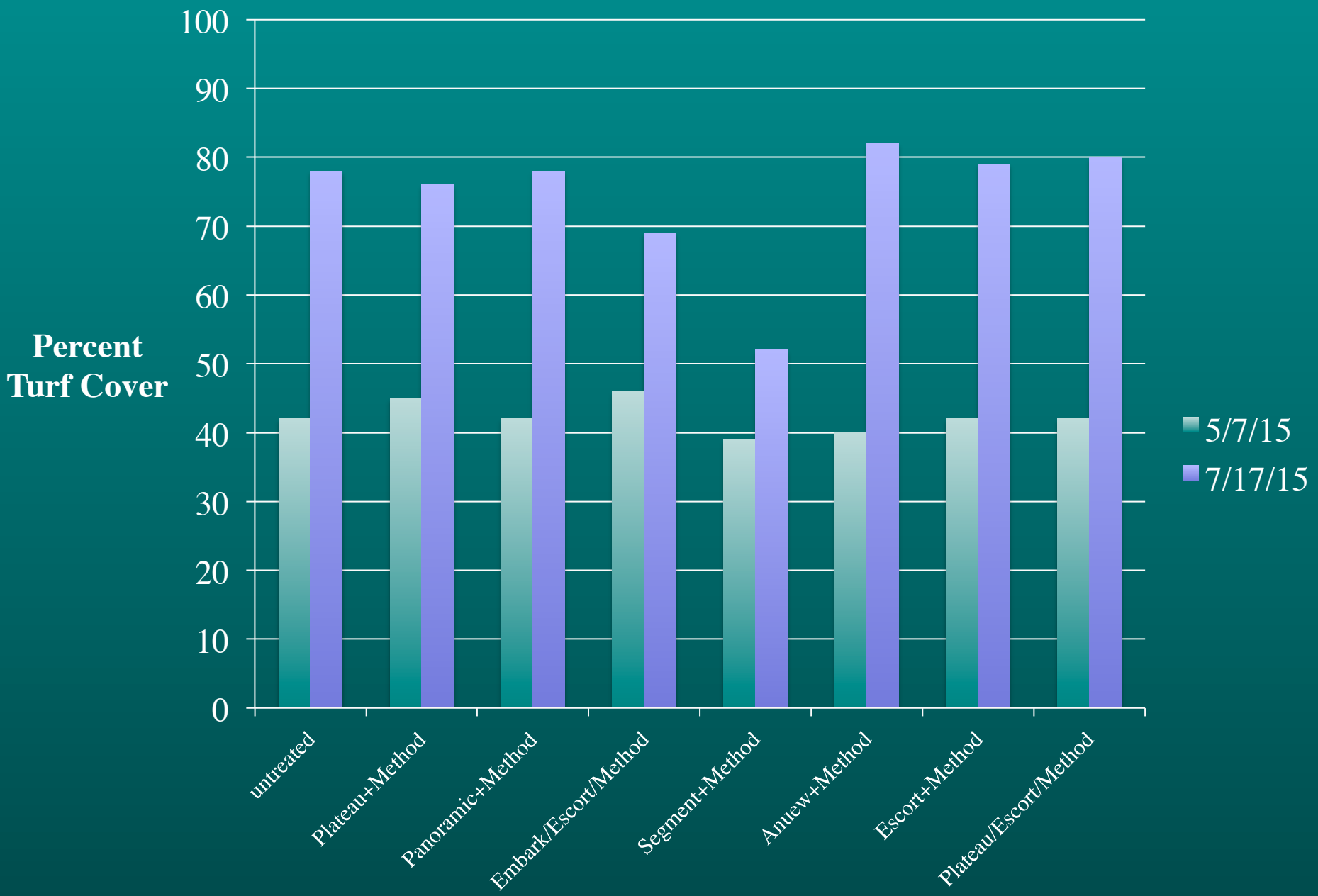
Turf Phytotoxicity
Port Matilda



Turf Phytotoxicity
Pleasant Gap



Turf Cover
Port Matilda

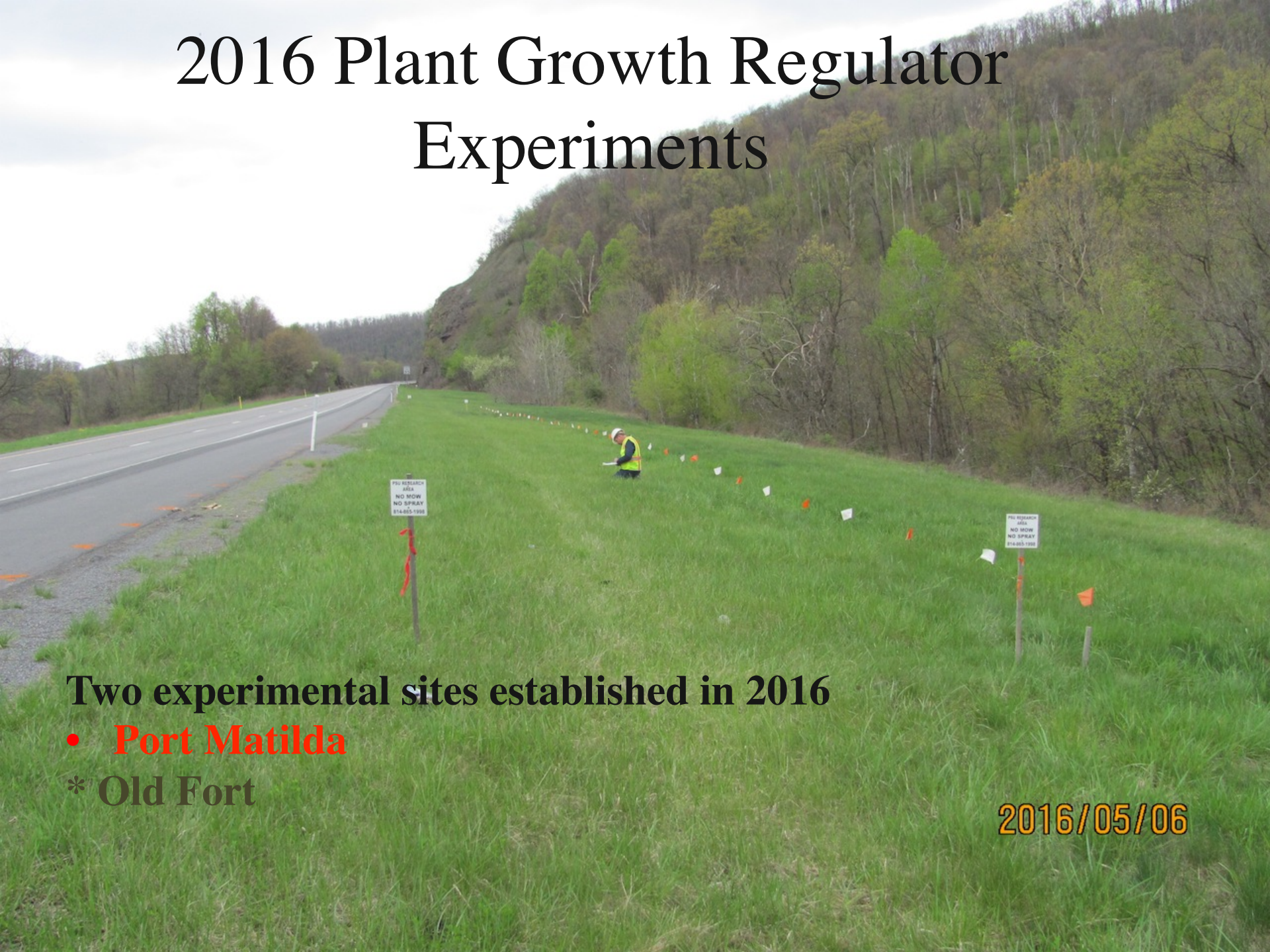


Kentucky bluegrass

- Negligible difference in height
- No seedhead suppression

Trt	Product	Rate (oz/ac)
1	untreated	---
2	Plateau Method	2 5
3	Panoramic Method	2 5
4	Embark Escort XP Method	6 0.2 5
5	Segment Method	24 5
6	Anuew Method	21.8 5
7	Escort XP Method	0.33 5
14	Plateau Escort XP Method	2 0.2 5

2016 Plant Growth Regulator Experiments



Two experimental sites established in 2016

- **Port Matilda**

*** Old Fort**

Anuew

- Manufacturer: NuFarm
- Active ingredient: prohexadione calcium
- Golf course rates
  - 14.5-21.8 oz/ac label for KBG
  - 21.8-29.1 oz/ac label for per rye
- Sod rates
  - 7.25-29.1 oz/ac label for cool-season grasses

Segment

- Manufacturer: BASF
- Active ingredient: sethoxydim
- Application rates: 1.5 pts/ac
- Discoloration to tall fescue will occur, persist 2 to 8 wks.
- Tall fescue must be 1 year old
- Only apply once/season
- No broadleaf weed control offered

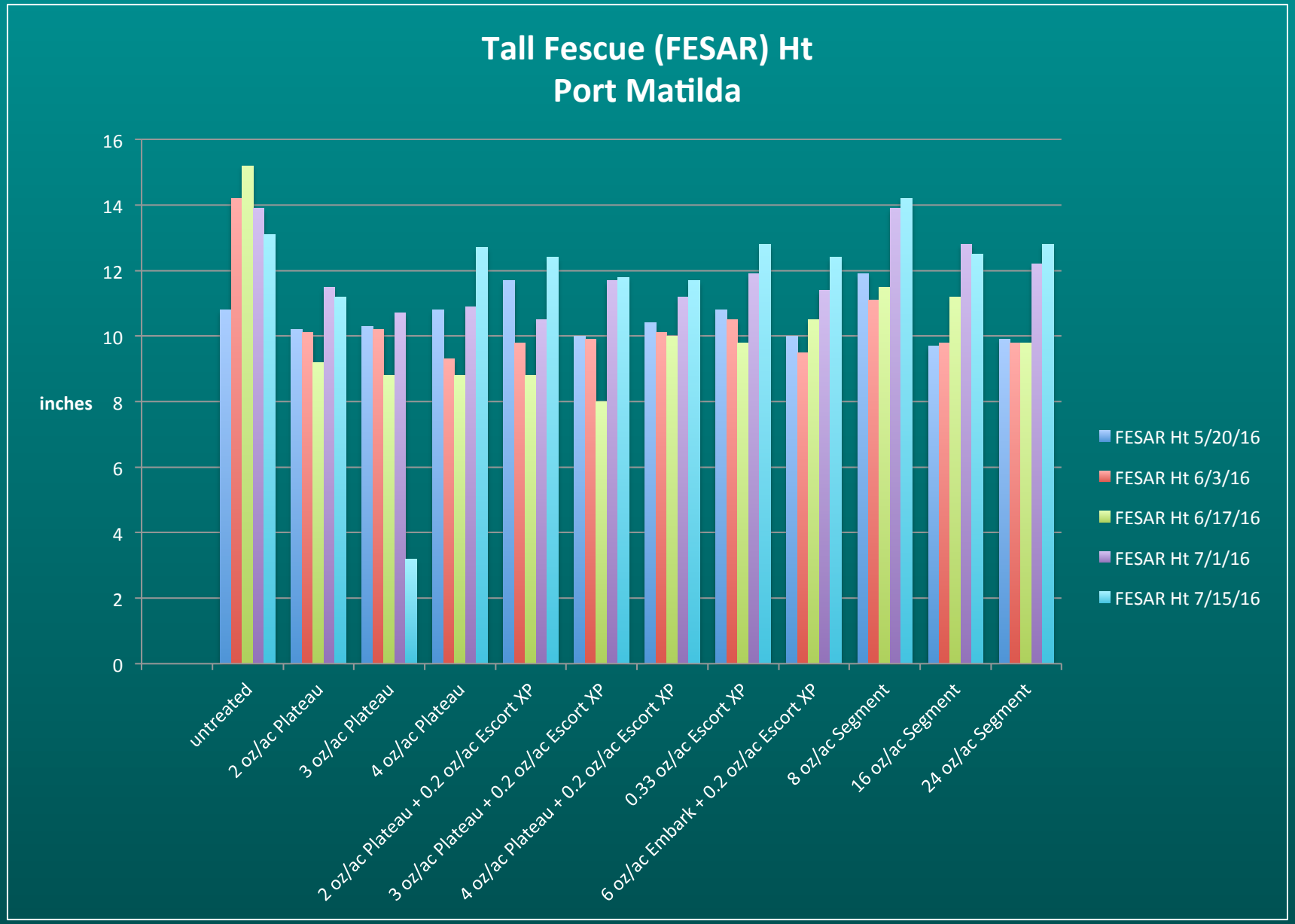
product	oz/ac	product	oz/ac
untreated	---		
Plateau Method 240SL	2 10	Escort XP Method 240SL	0.33 10
Plateau Method 240SL	3 10	Embark 2S Escort XP Method 240SL	6 0.2 10
Plateau Method 240SL	4 10	Segment Method 240SL	8 10
Plateau Escort XP Method 240SL	2 0.2 10	Segment Method 240SL	16 10
Plateau Escort XP Method 240SL	3 0.2 10	Segment Method 240SL	24 10
Plateau Escort XP Method 240SL	4 0.2 10		

Experimental Sites

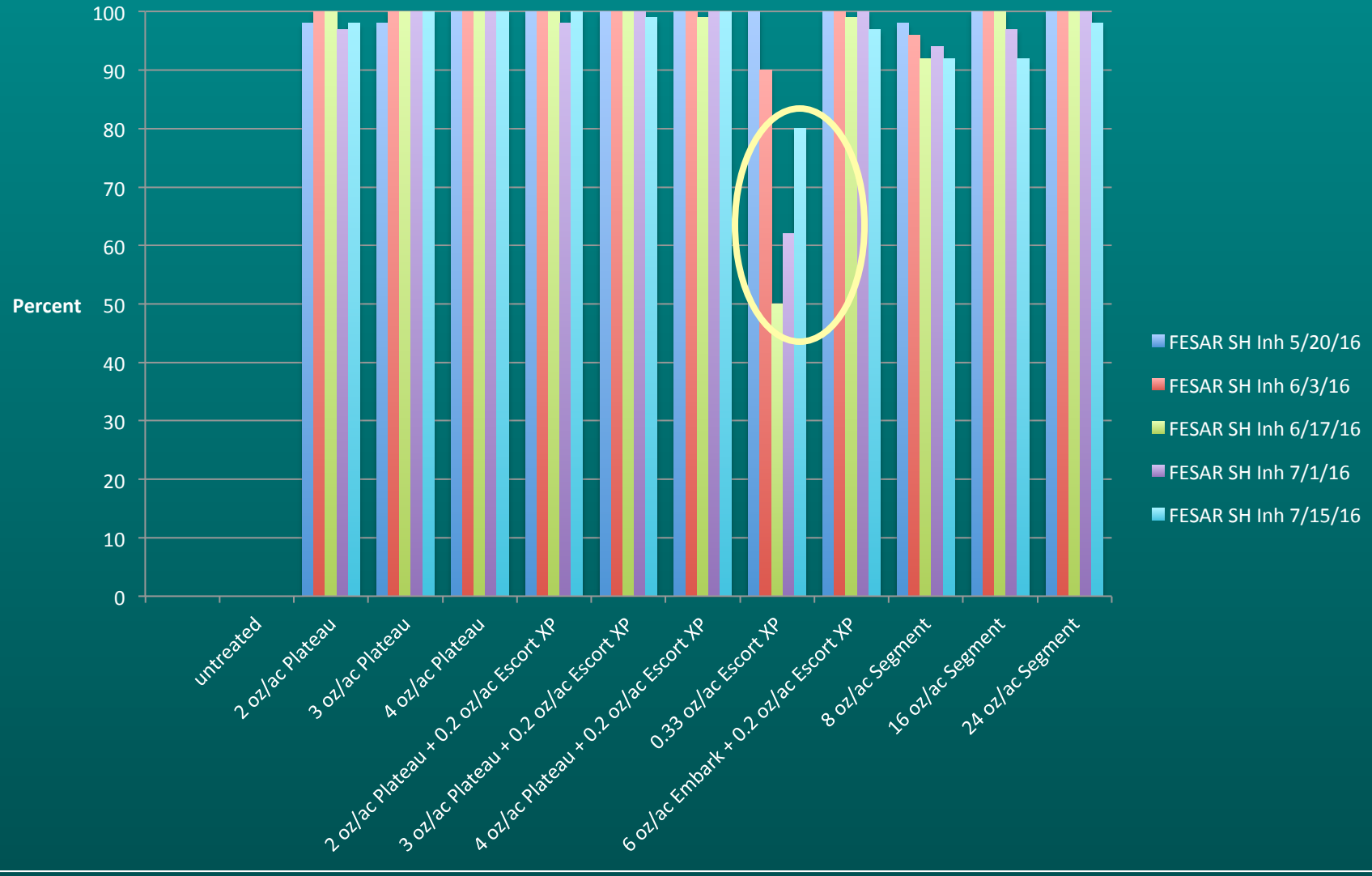
- Treatments applied April 27 to May 6, 2016.
- Evaluated at 2 week intervals
- Induce non-ionic surfactant added to all treatments @ 0.25% v/v.
- Applied with CO_2 backpack sprayer equipped with 6 ft. boom and (4) 8004 VS tips.
- 6 x 20 ft. plots, 4 reps
- 35 GPA

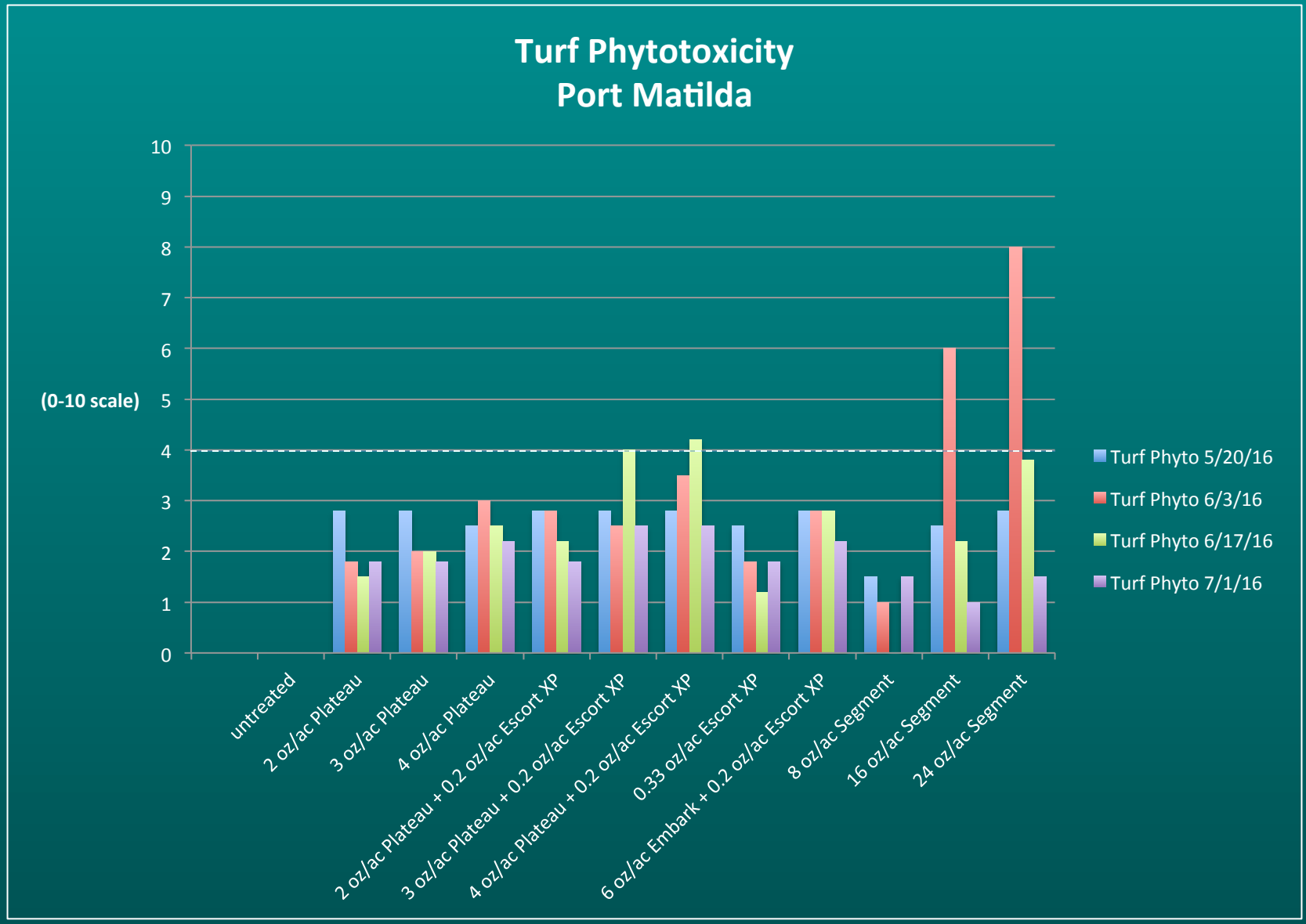
Data Collected

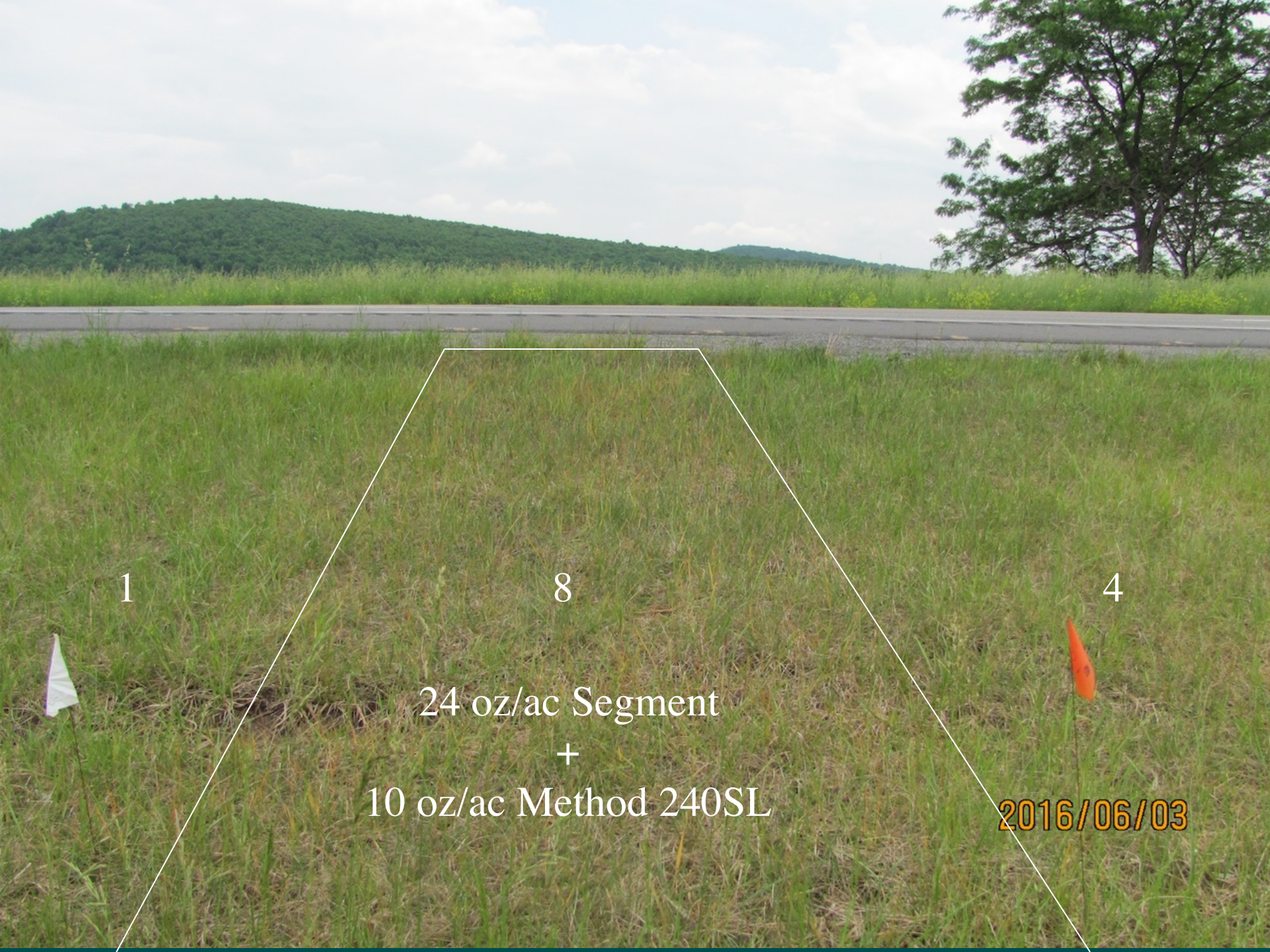
- Turf Height
  - blade length
- Seedhead Reduction
  - percent seedheads visibly absent for species
- Turf Phytotoxicity
  - scale (0-10)
- Turf Cover
- Broadleaf Weed Control


Tall Fescue (FESAR) Ht
Port Matilda
inches
16
14
12
10
8
6
4
2
0
untreated
2 oz/ac Plateau
3 oz/ac Plateau
4 oz/ac Plateau
2 oz/ac Plateau + 0.2 oz/ac Escort XP
3 oz/ac Plateau + 0.2 oz/ac Escort XP
4 oz/ac Plateau + 0.2 oz/ac Escort XP
0.33 oz/ac Escort XP
6 oz/ac Embark + 0.2 oz/ac Escort XP
8 oz/ac Segment
16 oz/ac Segment
24 oz/ac Segment
FESAR Ht 5/20/16
FESAR Ht 6/3/16
FESAR Ht 6/17/16
FESAR Ht 7/1/16
FESAR Ht 7/15/16

Tall Fescue (FESAR) Seedhead Inhibition
Port Matilda




Turf Phytotoxicity
Port Matilda
(0-10 scale)
10
9
8
7
6
5
4
3
2
1
0
untreated
2 oz/ac Plateau
3 oz/ac Plateau
4 oz/ac Plateau
2 oz/ac Plateau + 0.2 oz/ac Escort XP
3 oz/ac Plateau + 0.2 oz/ac Escort XP
4 oz/ac Plateau + 0.2 oz/ac Escort XP
0.33 oz/ac Escort XP
6 oz/ac Embark + 0.2 oz/ac Escort XP
8 oz/ac Segment
16 oz/ac Segment
24 oz/ac Segment
Turf Phyto 5/20/16
Turf Phyto 6/3/16
Turf Phyto 6/17/16
Turf Phyto 7/1/16


1
8
4
24 oz/ac Segment
+
10 oz/ac Method 240SL
2016/06/03

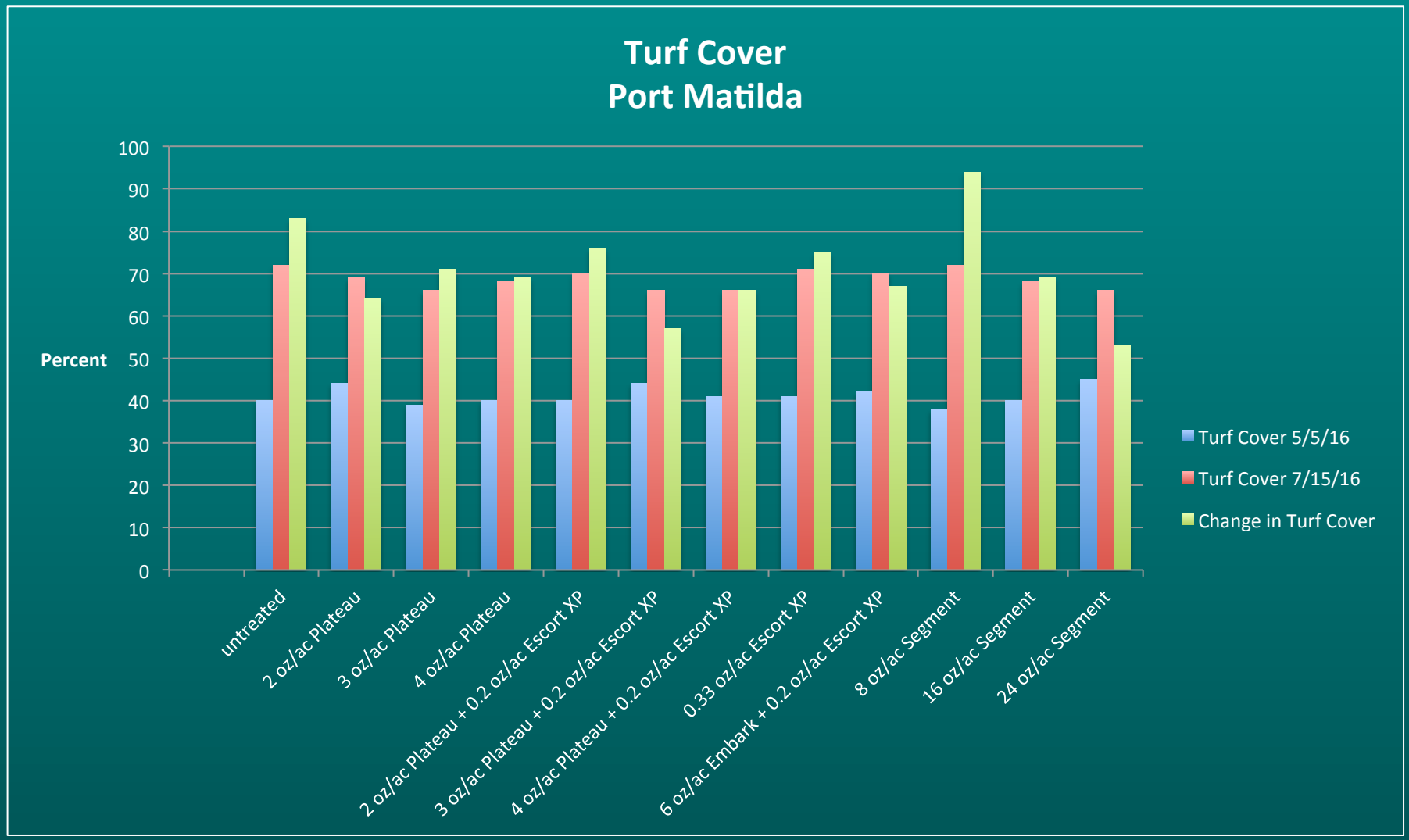
Phytotoxicity Summary

Questionable injury with:

3 oz/ac Plateau plus 0.2 oz/ac Escort XP

4 oz/ac Plateau plus 0.2 oz/ac Escort XP

16 oz/ac or greater Segment


Turf Cover
Port Matilda
Percent
100
90
80
70
60
50
40
30
20
10
0
untreated
2 oz/ac Plateau
3 oz/ac Plateau
4 oz/ac Plateau
2 oz/ac Plateau + 0.2 oz/ac Escort XP
3 oz/ac Plateau + 0.2 oz/ac Escort XP
4 oz/ac Plateau + 0.2 oz/ac Escort XP
0.33 oz/ac Escort XP
6 oz/ac Embark + 0.2 oz/ac Escort XP
8 oz/ac Segment
16 oz/ac Segment
24 oz/ac Segment
Turf Cover 5/5/16
Turf Cover 7/15/16
Change in Turf Cover

Birdsfoot Trefoil Injury
Port Matilda

product	oz/ac	product	oz/ac
untreated	---		
Plateau Method 240SL	2 10	Escort XP Method 240SL	0.33 10
Plateau Method 240SL	3 10	Embark 2S Escort XP Method 240SL	6 0.2 10
Plateau Method 240SL	4 10	Segment Method 240SL	8 10
Plateau Escort XP Method 240SL	2 0.2 10	Segment Method 240SL	16 10
Plateau Escort XP Method 240SL	3 0.2 10	Segment Method 240SL	24 10
Plateau Escort XP Method 240SL	4 0.2 10		


06/08/2010