

2014 Disease Management Update

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Today

◉ Anthracnose

- Biology
- IWA supported research into host resistance
- Timing of fungicide applications

◉ Fusarium wilt

- IR-4 supported fungicide research
- Proline 480 SC

Anthracnose of watermelon

Anthracnose management

- Crop rotation ~3 years
- Fall tillage
- Field/greenhouse sanitation
- Timely fungicide applications



anthracnose

Host resistance-anthracnose

- Diploid varieties needed to pollinate seedless
- Non-harvested diploids often used
- Pollenizers vary greatly in fruit size, leaf shape etc.
- Are there differences in anthracnose resistance?



Sweet harmony watermelon pollinizer



Sidekick watermelon pollenizer



Polimax watermelon pollinizer



SP-5 watermelon pollinizer



Royal Sweet watermelon



Ace watermelon pollinizer

ANT resistance in pollenizers

- 15 diploid varieties grown in randomized/replicated design
- Inoculated with anthracnose fungus
- Plants rated for disease
- 2012 and 2013

Rainfall comparison in inches-Vincennes, IN

Month	2012	2013
May	1.33	9.57
June	0.47	8.35
July	1.59	3.53
August	2.76	0.65

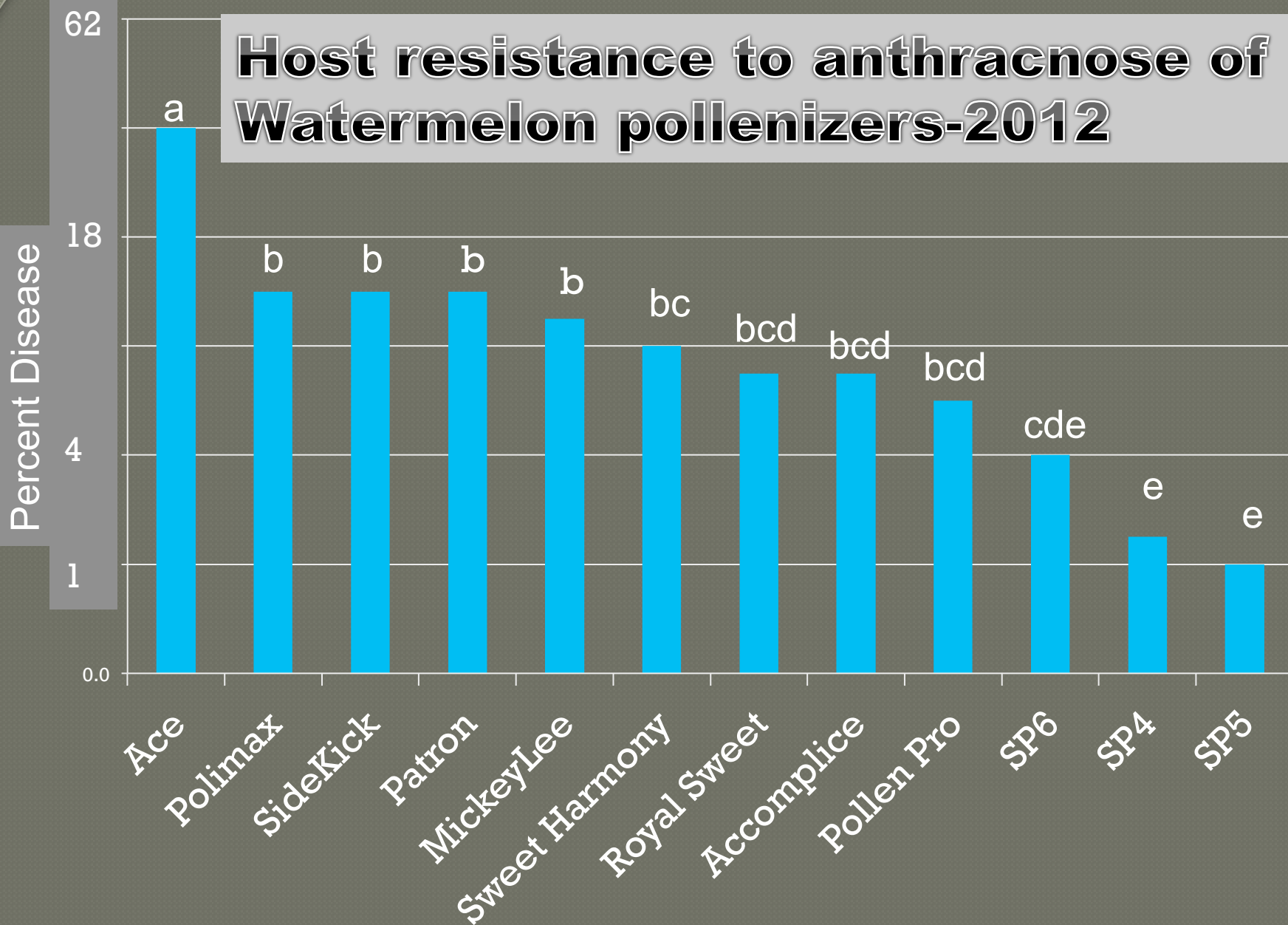
Both May and June were
the 4th wettest since 1984.

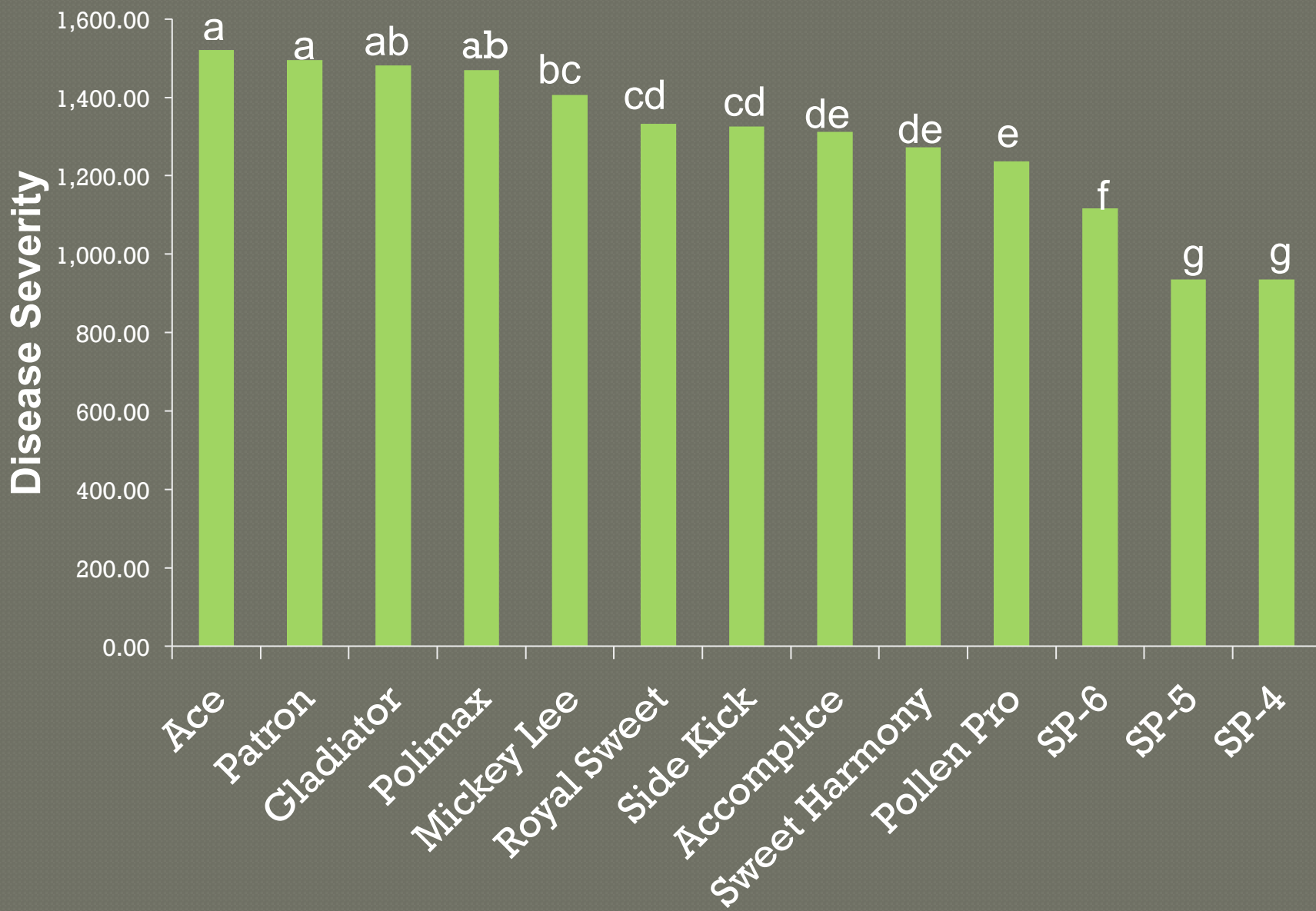


**IWA Supported Research:
Pollenizer resistance to
anthracnose of watermelon**



Host resistance to anthracnose of Watermelon pollenizers-2012





Host resistance of watermelon pollenizers-2013

Table of watermelon pollenizer anthracnose resistance-Page 98 2014 MW Veg Prod Guide

Variety	Type	Resistance ¹
Accomplice	pollenizer	++1/2
Ace	pollenizer	+
Mickey Lee	pollenizer/edible	++
Patron	pollenizer	++
Pollen pro	pollenizer	+++
Pollimax 6017	pollenizer	++
Royal Sweet	edible	++
Sweet Harmony	pollenizer	++1/2
SP-4	pollenizer	++++
SP-5	pollenizer	++++
SP-6	pollenizer	++++

+ is susceptible

++++ is resistant

Early Season Male Flowers 2013 Data

Variety	Seed Company	Total Flowers per square meter ^z	Average Flowers per square meter per week
Gladiator	Nunhems	10.8 a ^y	5.4 a
SP5	Syngenta	8.4 ab	4.2 ab
Polimax	Nunhems	7.3 bc	3.7 bc
Pollen Pro	Syngenta	6.8 bc	3.4 bc
Mickeylee	Wilhite Seed	6.8 bc	3.4 bc
SP4	Syngenta	6.3 bc	3.2 bc
Patron	Syngenta	6.1 bc	3.1 bc
Ace	Sakata	5.3 bcd	2.7 bcd
ACX 10319DP	Nunhems	4.8 cde	2.4 cde
Accomplice	Harris Moran	4.3 cde	2.2 cde
Side Kick	Harris Moran	2.4 def	1.2 def
SP6	Syngenta	2.1 def	1.1 def
Sweet Harmony	Sakata	1.6 ef	0.8 ef
Royal Sweet	Seminis	1.5 ef	0.8 ef
Champ	USDA	0.6 f	0.3 f

^zWeekly flower count from June 4 –June 11 (2 weeks)

^yMeans in columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.

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Mid-Season Male Flowers

Variety	Seed Company	Total Flowers per square meter ^z	Average Flowers per square meter per week
Side Kick	Harris Moran	42.4 a ^y	21.2 a
Accomplice	Harris Moran	41.5 a	20.8 a
Pollen Pro	Syngenta	39.3 a	19.7 a
SP4	Syngenta	38.0 a	19.0 a
SP5	Syngenta	37.6 a	18.9 a
Patron	Syngenta	27.5 b	13.8 b
SP6	Syngenta	27.1 b	13.6 b
Sweet Harmony	Sakata	24.5 bc	12.3 bc
ACX 10319DP	Nunhems	23.6 bc	11.9 bc
Gladiator	Nunhems	23.4 bc	11.7 bc
Ace	Sakata	22.6 bc	11.4 bc
Mickeylee	Wilhite Seed	21.8 bc	10.9 bc
Royal Sweet	Seminis	19.9 c	10.0 c
Polimax	Nunhems	19.5 c	9.8 c
Champ	USDA	9.8 d	4.9 d

^zWeekly flower count from June 19 – June 25 (2 weeks)

^yMeans in columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.

Late Season Male Flowers

Variety	Seed Company	Total Flowers per square meter ^z	Average Flowers per square meter per week
SP5	Syngenta	26.8 a ^y	8.9 a
SP6	Syngenta	20.0 b	6.7 b
SP4	Syngenta	18.4 bc	6.1 bc
Champ	USDA	14.8 cd	4.9 cd
Accomplice	Harris Moran	11.9 de	4.0 de
Side Kick	Harris Moran	7.1 ef	2.4 ef
ACX 10319DP	Nunhems	6.8 fg	2.3 fg
Pollen Pro	Syngenta	5.4 fgh	1.8 fgh
Royal Sweet	Seminis	2.4 fghi	0.8 fghi
Gladiator	Nunhems	2.2 fghi	0.7 fghi
Sweet Harmony	Sakata	1.9 ghi	0.6 ghi
Polimax	Nunhems	1.1 hi	0.4 hi
Mickeylee	Wilhite Seed	1.0 hi	0.4 hi
Patron	Syngenta	0.5 hi	0.2 hi
Ace	Sakata	0.3 i	0.1 i

^zWeekly flower count from July 2 – July 16 (3 weeks)

^yMeans in columns separated by Fisher's least significant difference test ($P \leq 0.05$), means with same letter are not significantly different.

Total Male Flowers

Variety	Seed Company	Total Flowers per square meter ^z	Average Flowers per square meter per week
SP5	Syngenta	72.8 a ^y	10.4 a
SP4	Syngenta	62.6 b	9.0 b
Accomplice	Harris Moran	57.6 bc	8.2 bc
Side Kick	Harris Moran	51.9 c	7.4 c
Pollen Pro	Syngenta	51.4 c	7.3 c
SP6	Syngenta	49.3 c	7.0 c
Gladiator	Nunhems	36.3 d	5.2 d
ACX 10319DP	Nunhems	35.1 d	5.0 d
Patron	Syngenta	34.1 de	4.9 de
Mickeylee	Wilhite Seed	29.5 def	4.2 def
Ace	Sakata	28.1 def	4.0 def
Sweet Harmony	Sakata	28.0 def	4.0 def
Polimax	Nunhems	27.9 def	4.0 def
Champ	USDA	25.1 ef	3.6 ef

^zWeekly flower count from May 30 – July 16 (7 weeks)

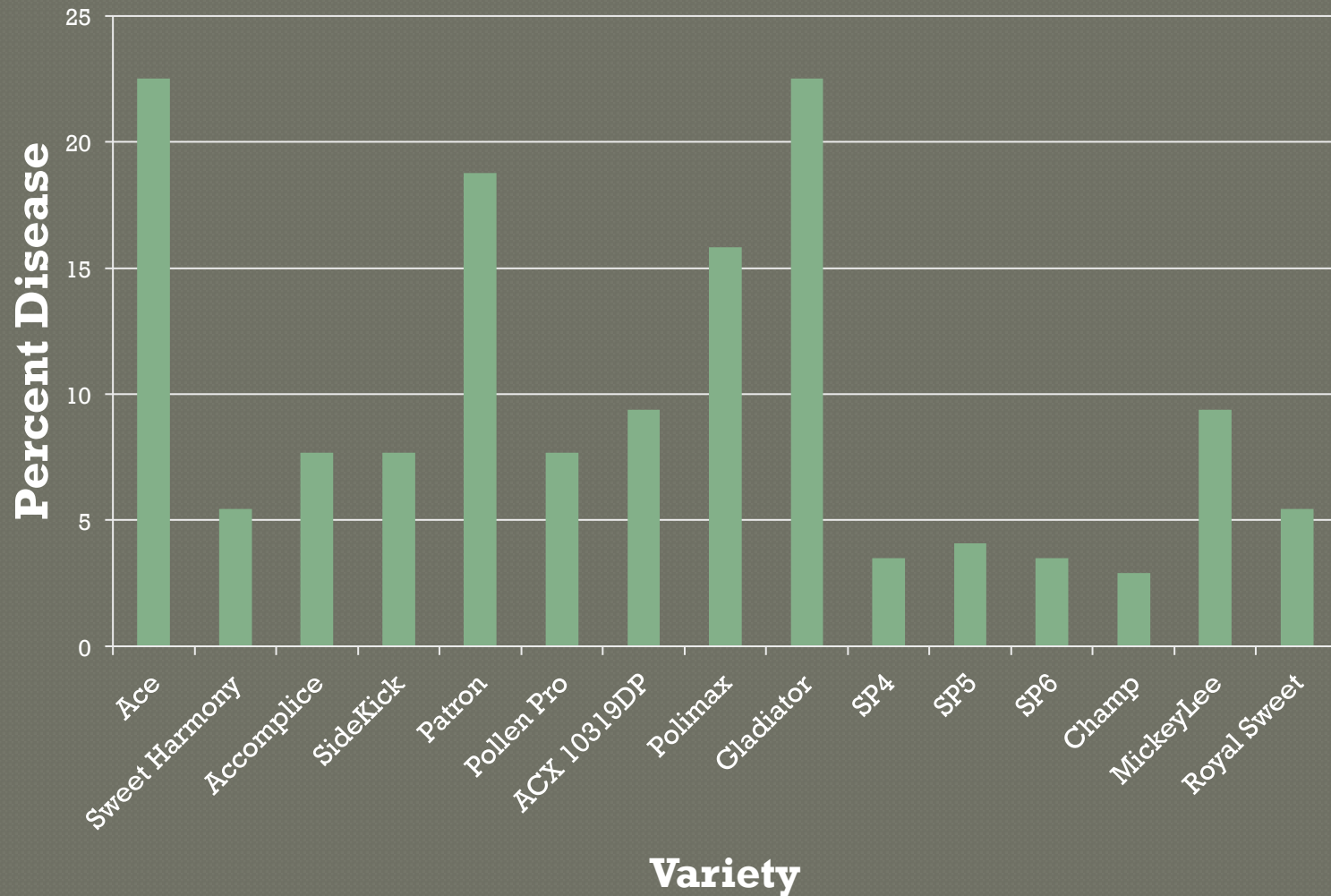
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Fungicide timing

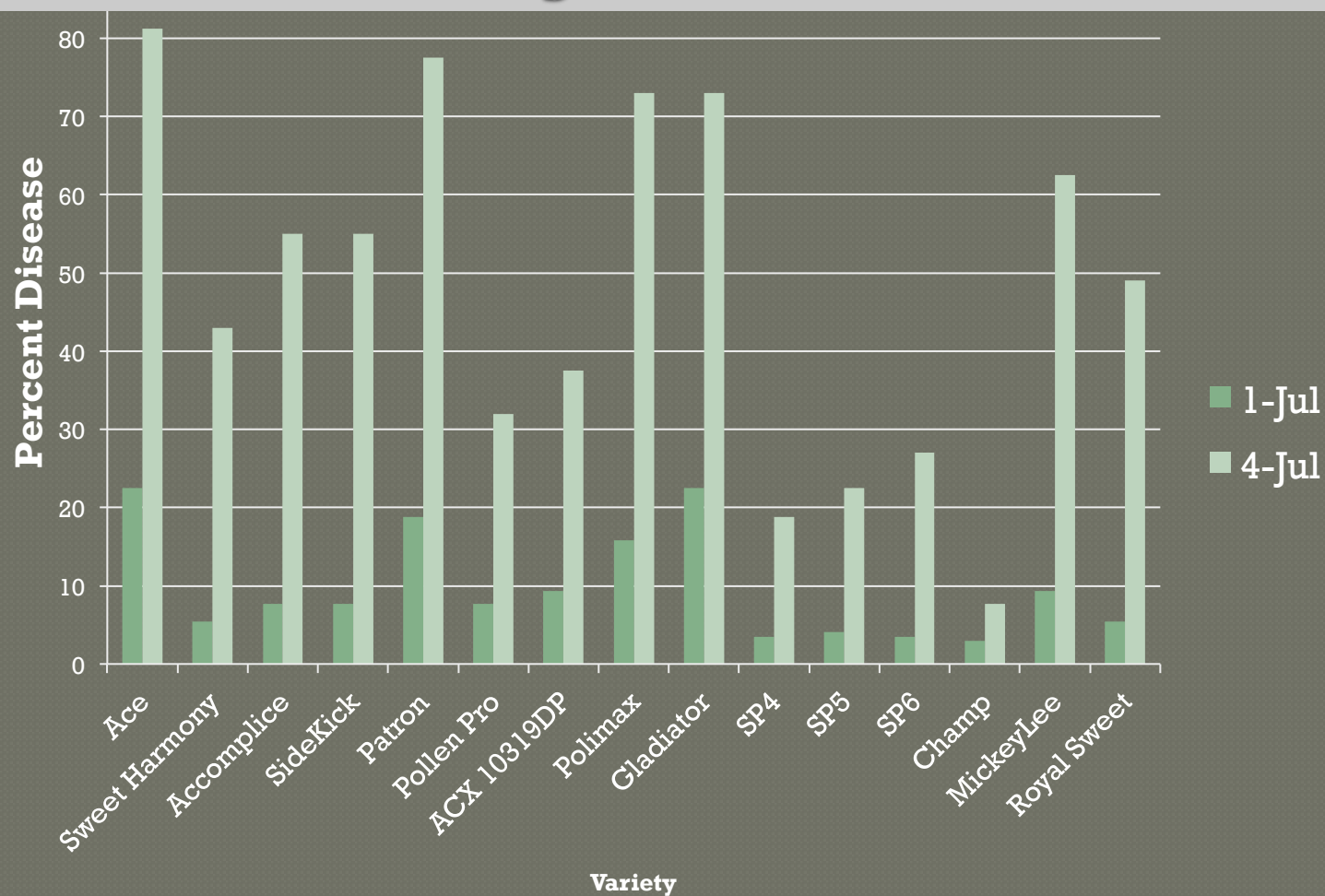
- Re-visit pollinizer trial



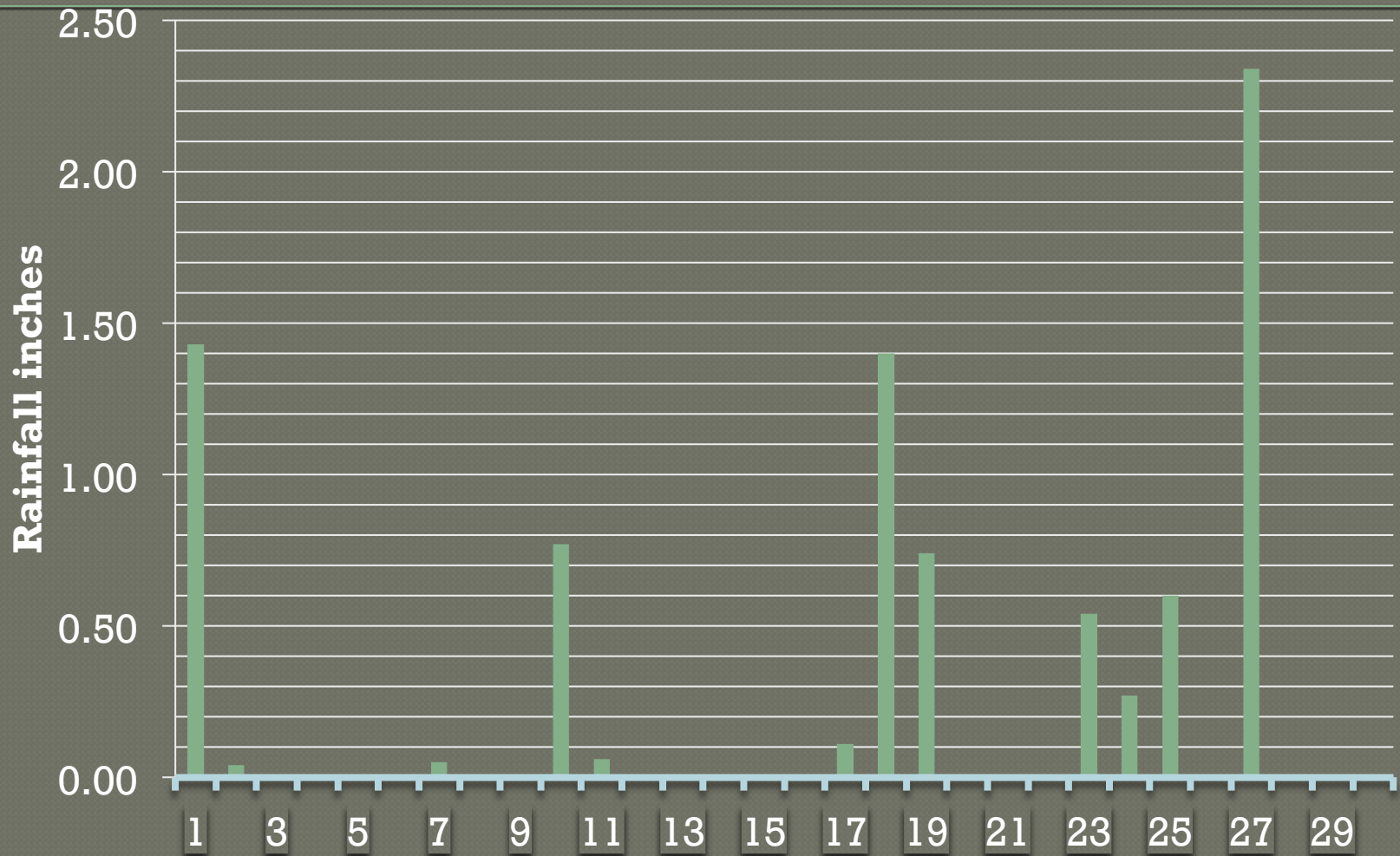
Anthracnose of watermelon-July 1 2013



Comparison of anthracnose severity- July 1 vs. 4-2013



Rainfall amounts for June 2013



How often should I spray?

- Most intervals should be 7-14 days.
- The frequency of rain is more important than the amount.
- A rain in the evening may be more impt than one at midday.
- It is best to spray before rain if possible.
- Poor crop rotation affects spray intervals.

MELCAST vs Calendar based

- Calendar-based--every 7-14 days
- MELCAST-every 7-14 days or 35 EFI values if sooner.

Fungicide applications with MELCAST-summer 2014

Date	Cumulative EFI values	EFI Spray counter	Days from last spray
15 June	82	--	--
22 June	114	32	7
29 June	144	30	7
3 July	179	35	5
17 July	206	27	14

Fusarium wilt of watermelon



Fusarium wilt of watermelon

◉ Management methods

- Long crop rotations
- Partial host resistance
- Inspect transplants
- Fungicides?

**Products labeled for Fusarium wilt of watermelon
Nathan Kleczewski field data-
USDA specialty grant**

Product	AUDPC
Untreated Check	1327.6
Serenade 1x	1244.0
Oxidate	1196.9
Serenade 2x	974.3
T22	908.8
Regalia	829.4
P-value	0.7282

**No significant difference in
products labeled before 2014**

IR-4 grant

- IR-4 is a USDA organization that helps label pesticides for specialty crops
- Dan Egel is IR-4 rep for Indiana

2009 IR-4 grant

- To find products for fungicide management of Fusarium wilt of watermelon-Egel, PI
 - Greenhouse screen
 - Field studies
- Proline 480 SC identified from this project

Proline 480 SC

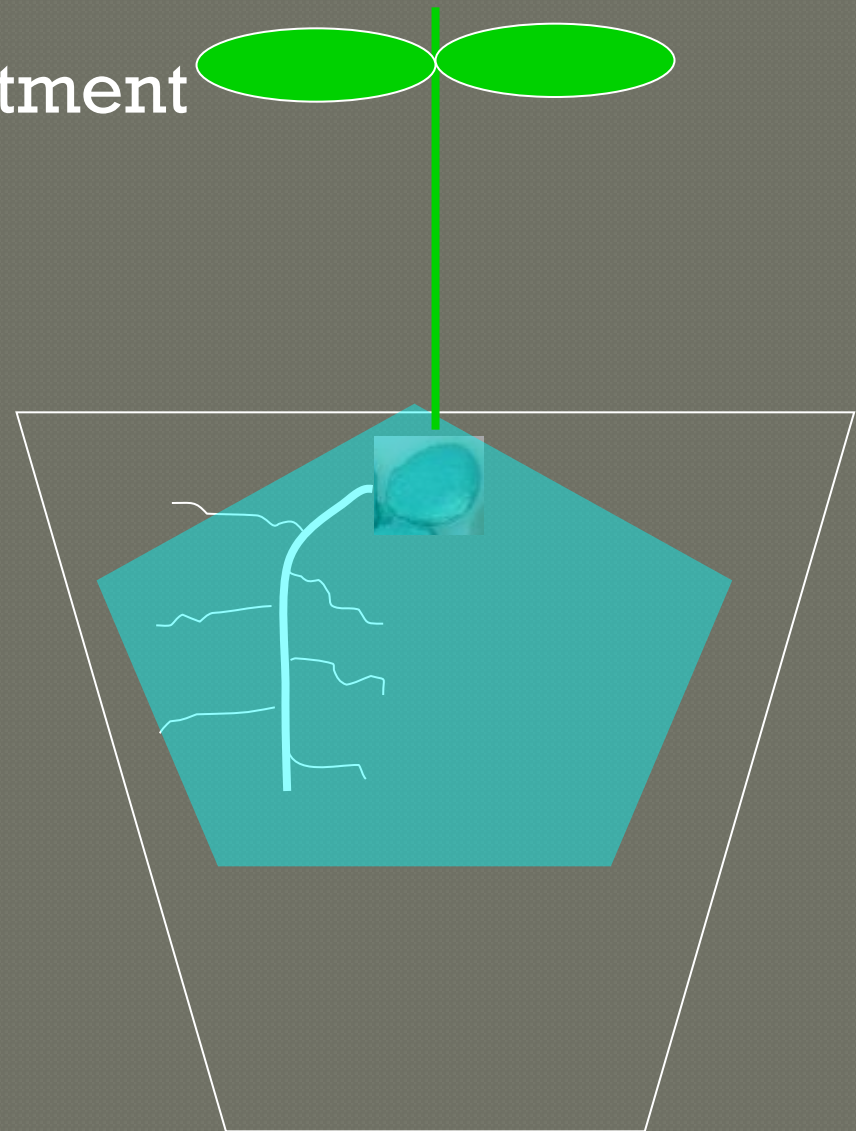
- Labeled for Fusarium wilt of watermelon
- PROLINE 480 SC FUNGICIDE may be applied by either ground or chemigation application equipment (including drip irrigation). Do not use in water used for hand transplanting. Not for use in greenhouse/transplant house.
- Also labeled for gummy stem blight, powdery mildew

Proline methods

- Labeled for drip application 5.7 fl oz per acre
- Apply at 0.25 acre inch after transplant

Proline Fungicide treatment for Fusarium wilt

- Fungicide must be taken up by roots
- Drip irrigation or high volume aerial spray



Proline data

- Indiana 2009-Proline treatment had 66% less wilt than control
- Maryland 2009-Proline treatment had 42% less wilt than control



Proline methods

- Each drip application 5.7 fl oz per acre
- 1st application 0.25 acre inch after transplant
- 2nd and 3rd application-0.5 acre inches at 2 & 4 weeks after transplant

Watermelon EFI Value Changes over 2 week period

