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School of Environmental and Biological Sciences

March Twilight Meeting

Coordinated by:
Carrie Denson

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March 26th, 2020

Welcome to March Twilight Meeting

Agenda for tonight:

5:30 pm: Gary Pavlis: Open meeting

5:35 pm: Gary Pavlis

5:45 pm: Thierry Besancon

5:55 pm: Peter Oudemans

6:05 pm: Dean Polk

6:15 pm: Carrie Denson

6:25 pm: Cesar Rodriguez-Saona

6:35 pm: Gary Pavlis: Close meeting

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Lessons Learned From The 2019 Leaf and Soil Analysis Data

Dr. Gary C. Pavlis
Atlantic County Agricultural Agent

pavlis@aesop.rutgers.edu

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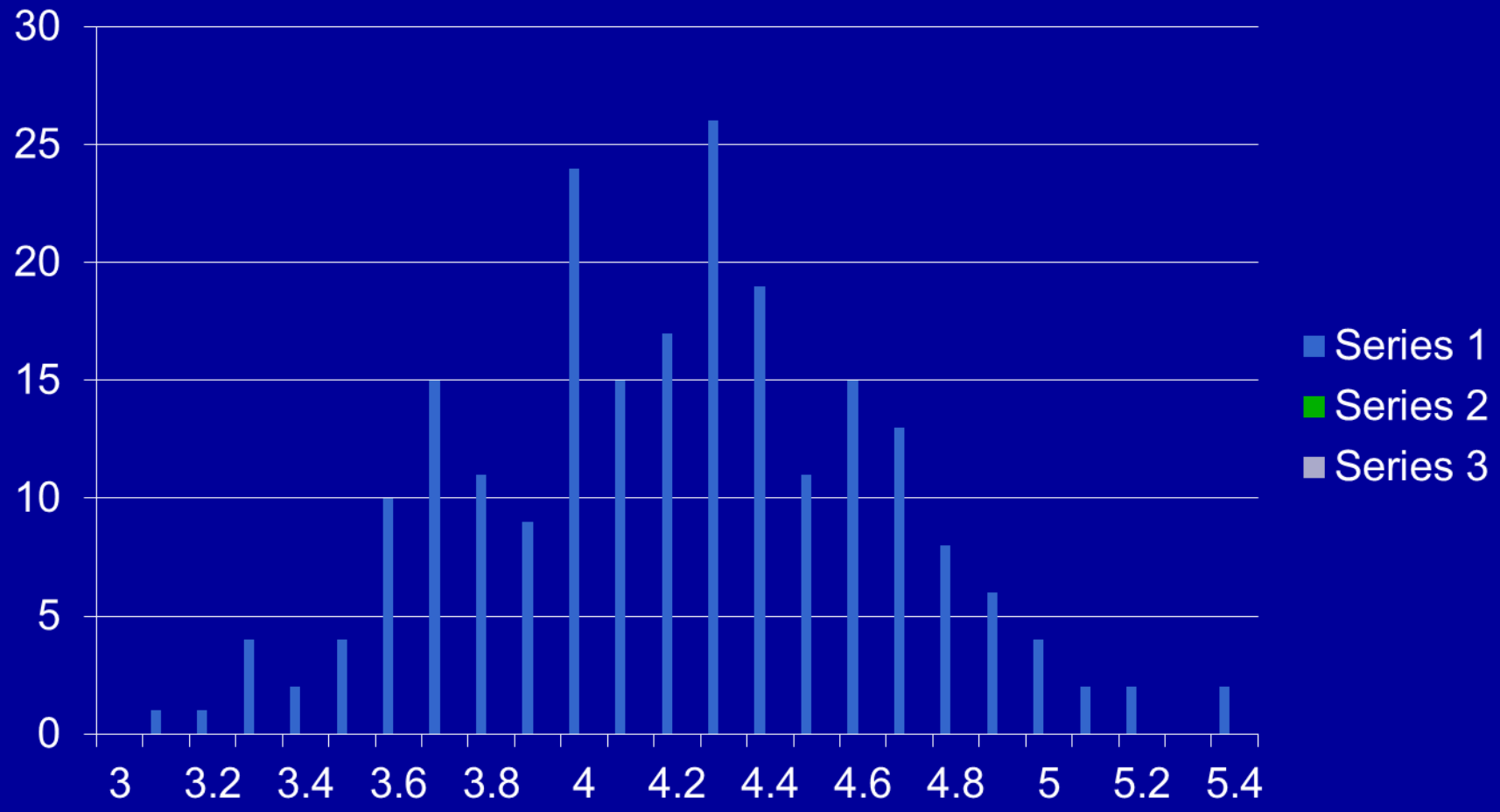
2019 pH



2019 Leaf Analysis

- 1.Total of 255 samples taken, 2,522 pieces of data
- 2. Analysis tests for:

Macro Nutrients	Micro-Nutrients
Nitrogen	Manganese
Phosphorus	Iron
Potassium	Copper
Calcium	Boron
Magnesium	Zinc

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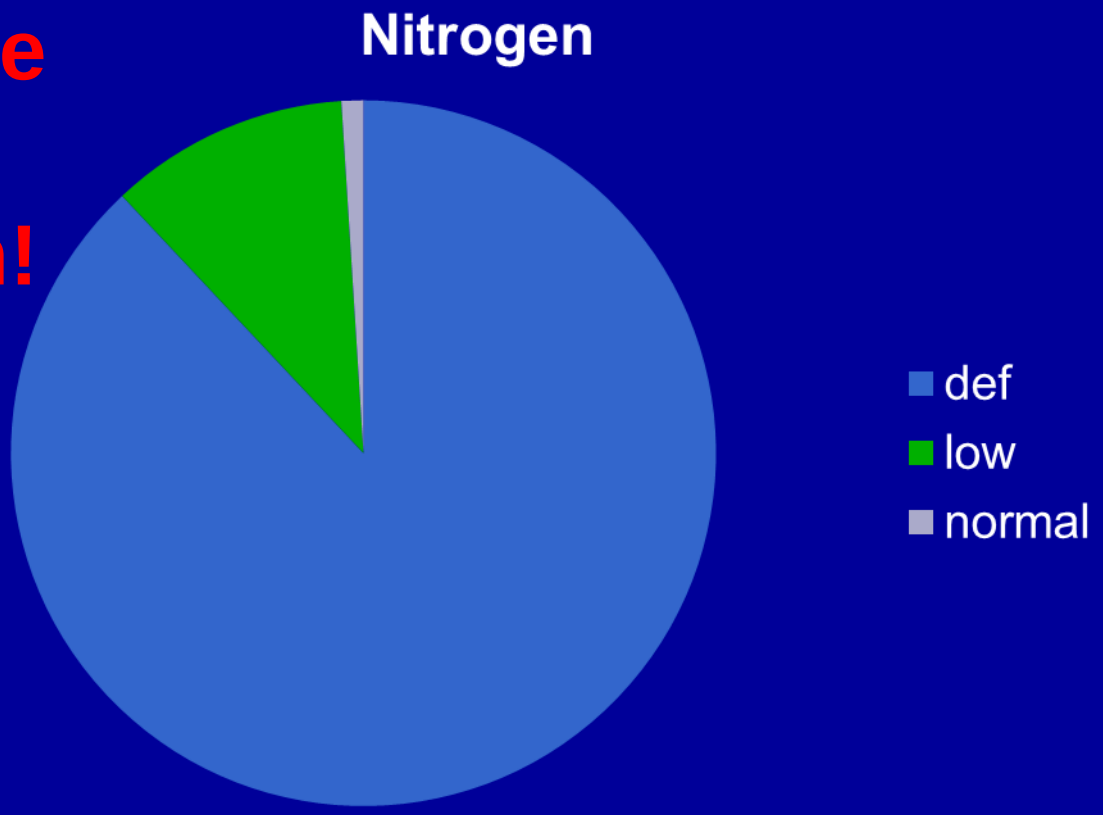
Leaf analysis - 2019

98.8% are below optimum!



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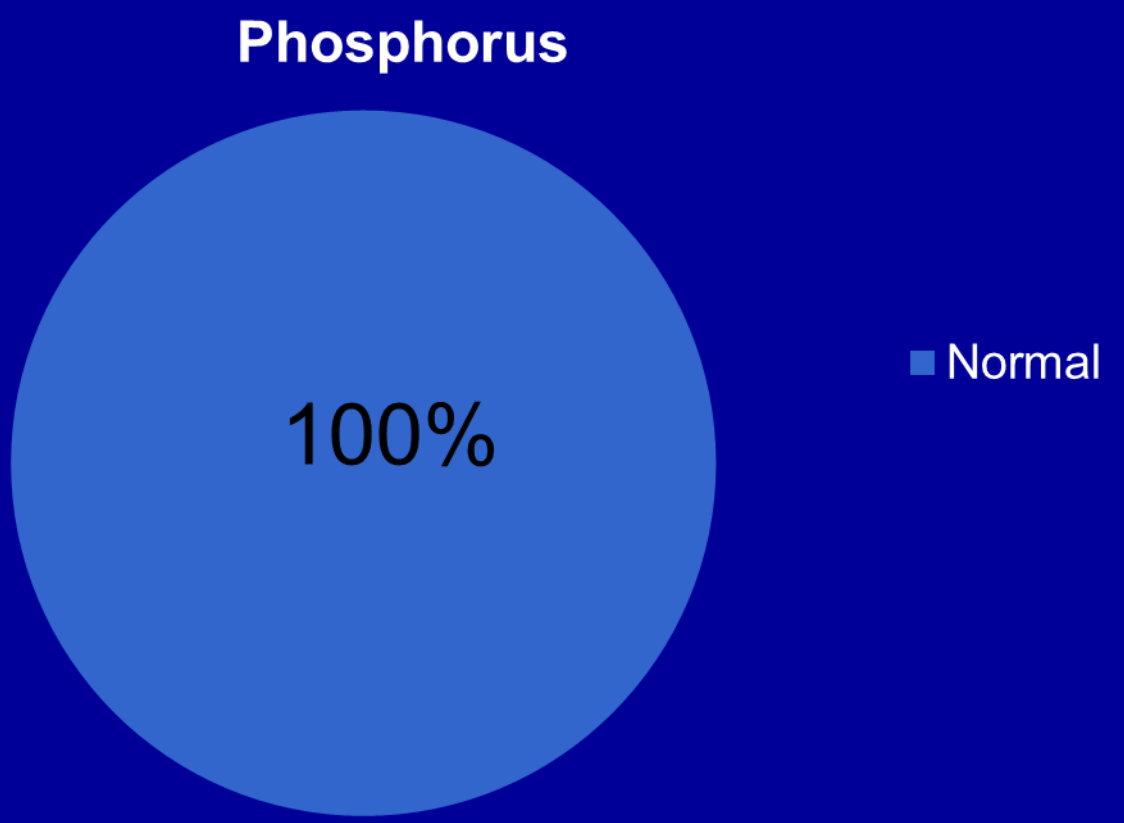
Leaf Analysis - 2019



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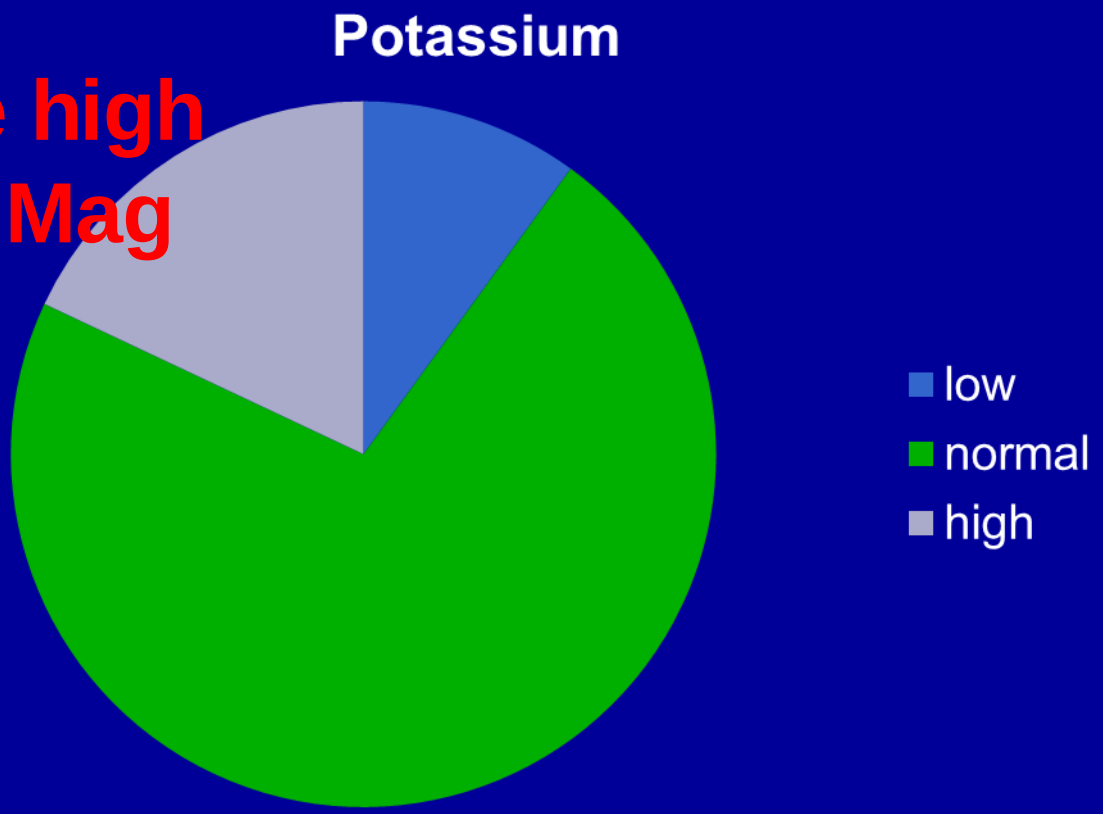
Leaf Analysis - 2019

18% are high
Ties up Mag



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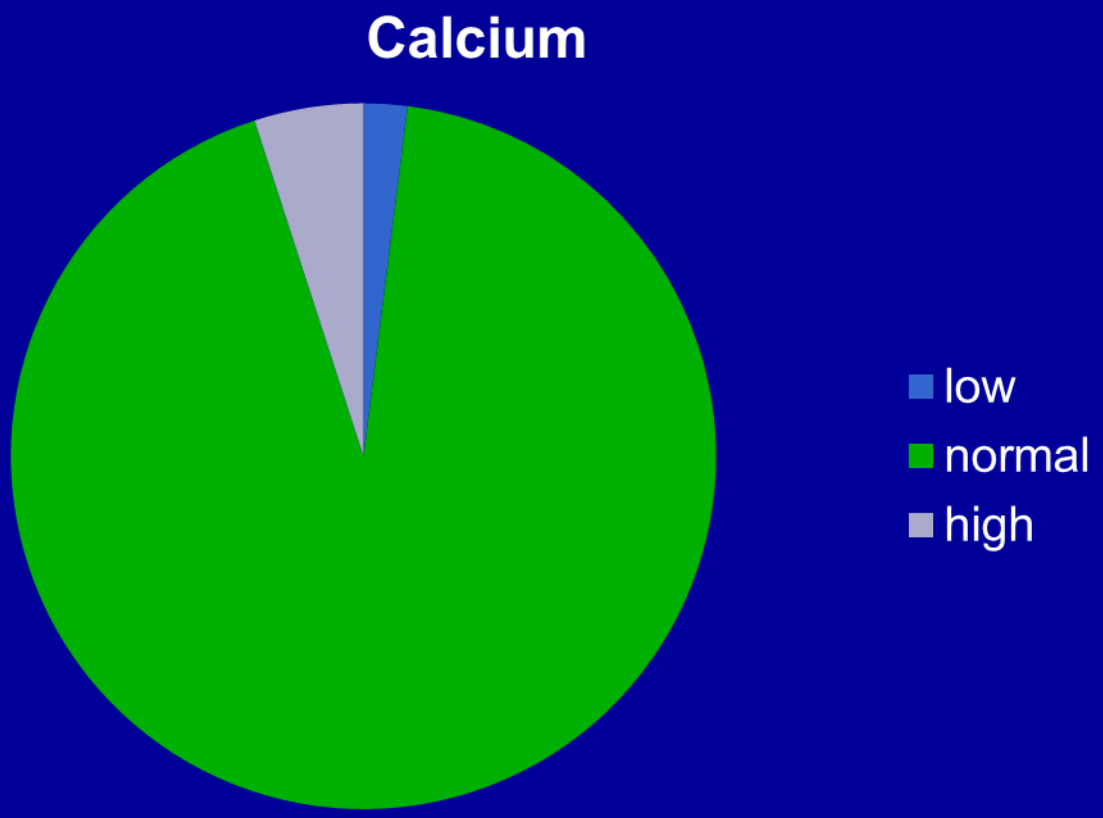
Leaf Analysis - 2019



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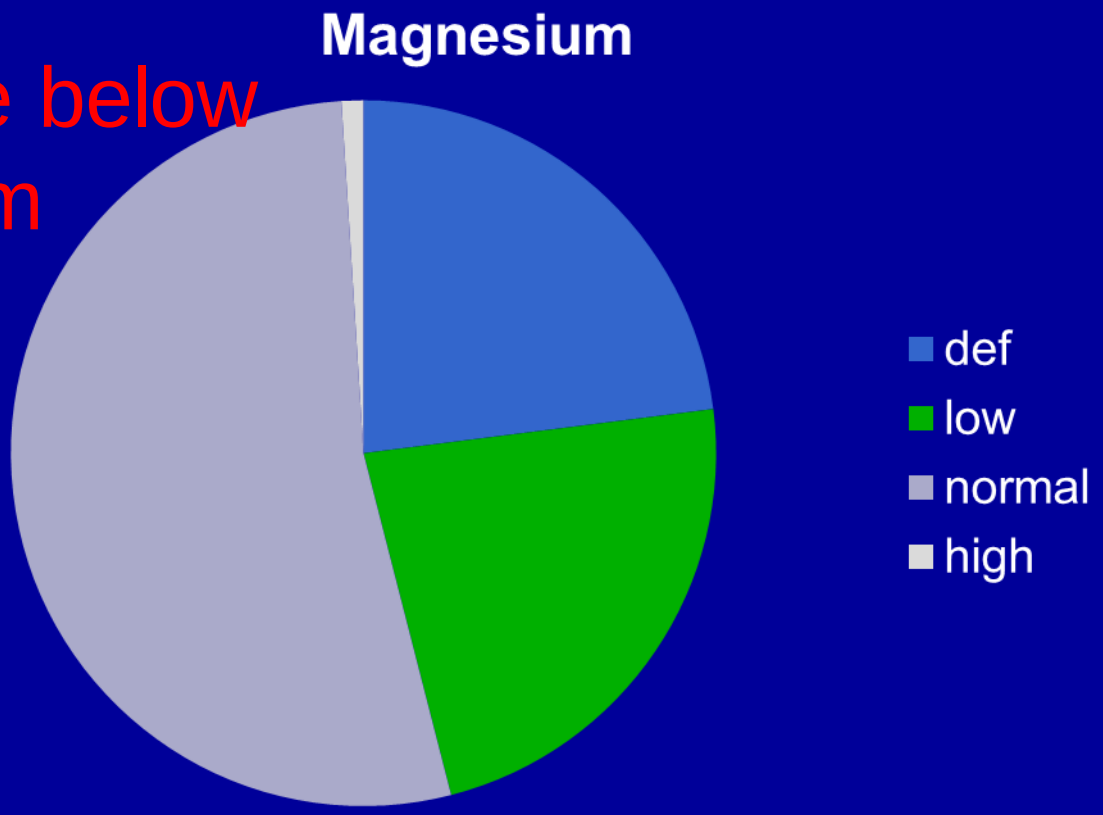
Leaf Analysis - 2019

46% are below optimum



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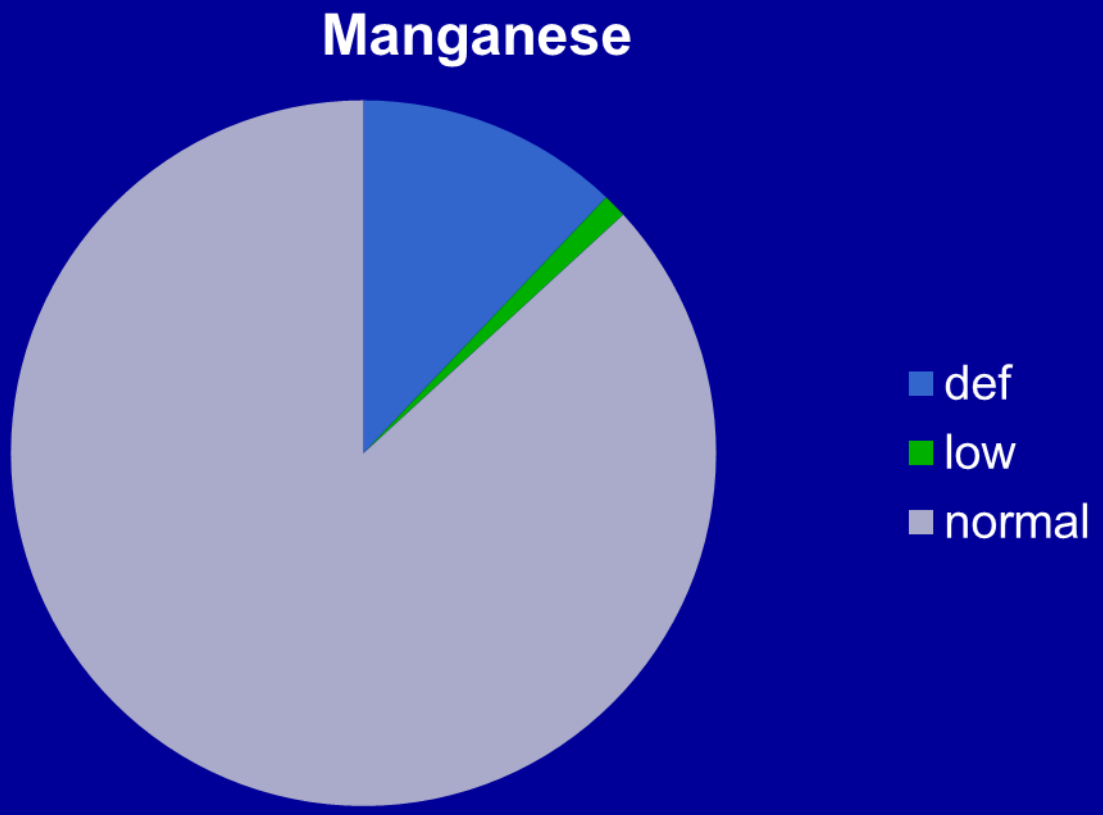
Leaf Analysis - 2019



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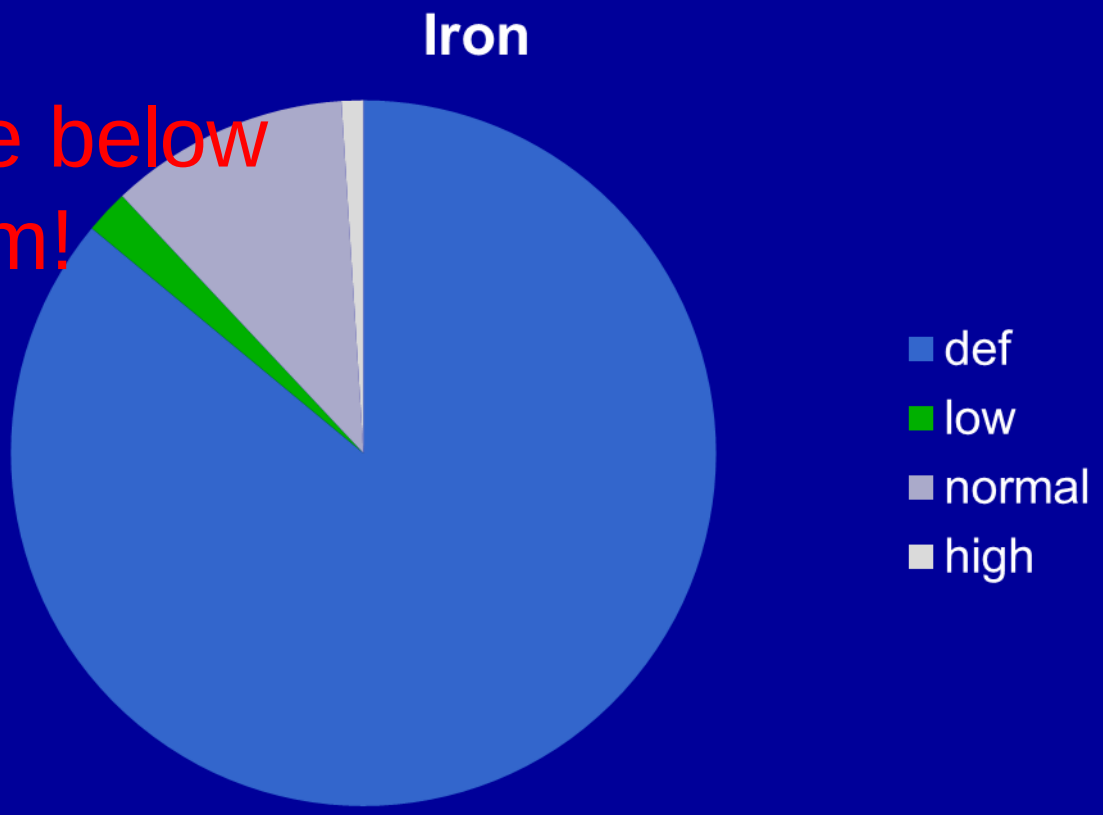
Leaf Analysis - 2019

88% are below Optimum!



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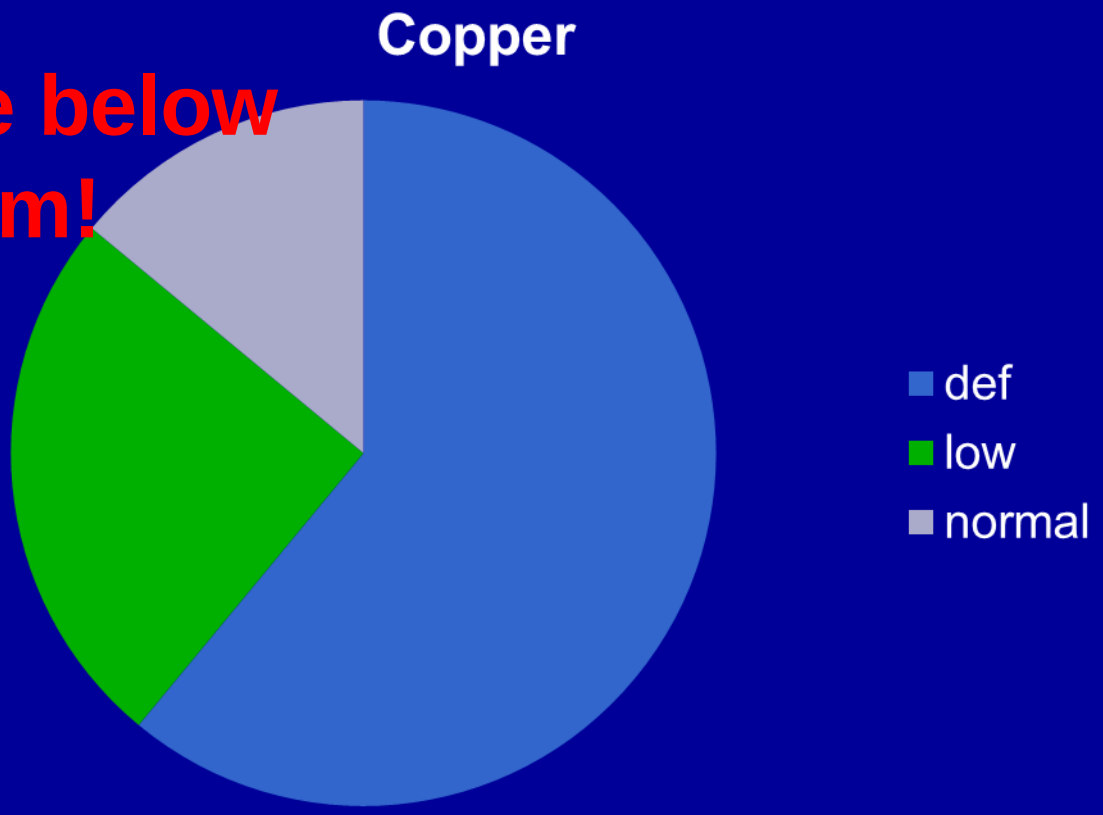
Leaf Analysis - 2019

86% are below optimum!



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Leaf Analysis - 2019

70% are above optimum!

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Boron – normal range 30-50ppm.

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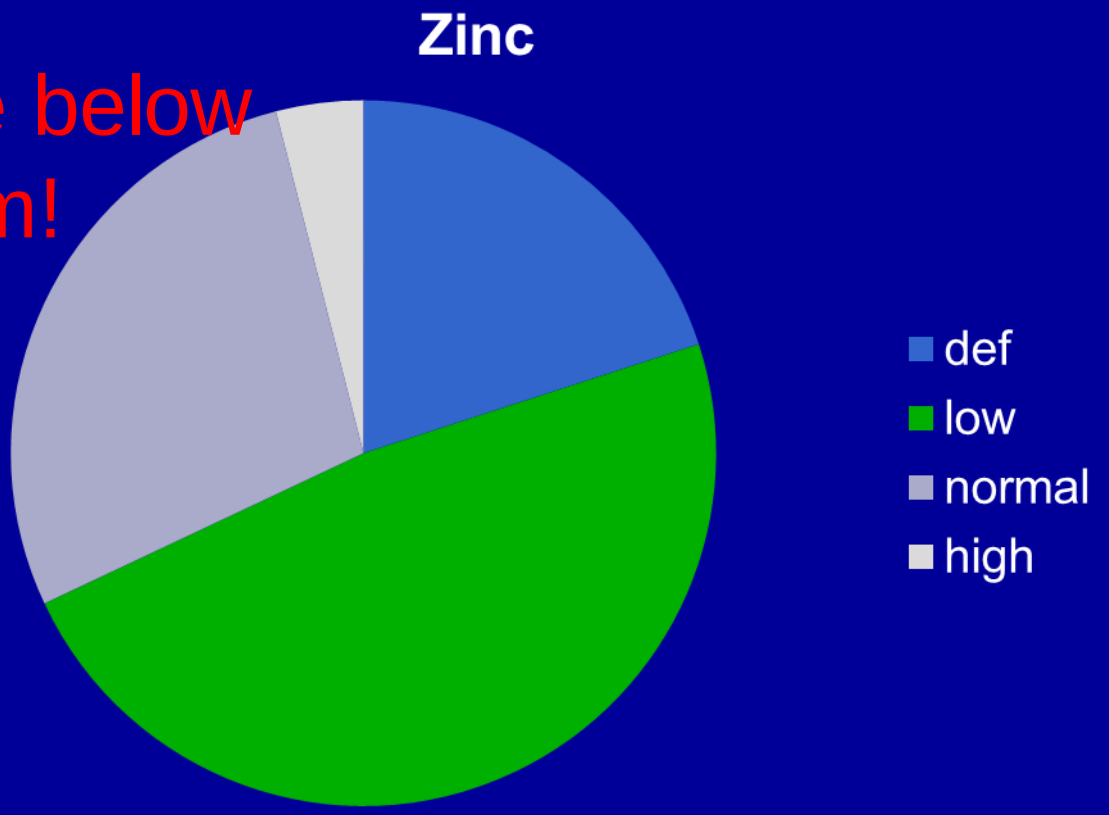
Leaf Analysis - 2014

68% are below optimum!



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Conclusions and Take Home Lessons

Macro - Nutrients

1. 98.8% of samples are low or deficient in Nitrogen, needs to be addressed.
2. 18% of samples are high in Potassium, This ties up Magnesium needs to be addressed.
3. 46% of samples are low or deficient in Magnesium, needs to be addressed.
4. Calcium and Phosphorus look good.

Micro – Nutrients

1. Key micro problems are Iron – 88% below optimum and Copper – 86% below optimum.
2. 70% of samples are high in Boron. There is a need to find out where this B is coming from and omit it.

Out of 255 samples only 3 had optimum nitrogen!!!!
IRON IS 88% LOW OR DEFIENCENT!!!

BORON IS 70% HIGH OR EXCESSIVE

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Low Nitrogen Effects

1. Decreased cell division
2. Decreased cell expansion.
3. Prolonged dormancy.
4. Delayed bud swell.
5. Reduction in size of leaves, fruit, stems and roots.
6. Decrease in formation of laterals.
7. Chlorophyll production decreased.
8. Premature leaf abscission.

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Iron deficiency Effects

Iron:

1. **Decreased photosynthesis.**
2. **Decreased protein synthesis.**
3. **Decreased chlorophyll synthesis.**

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Preemergence Herbicides for Blueberry Production

Thierry E. Besançon
Weed Science Extension Specialist
Blueberry Twilight Meeting – March 26th, 2020

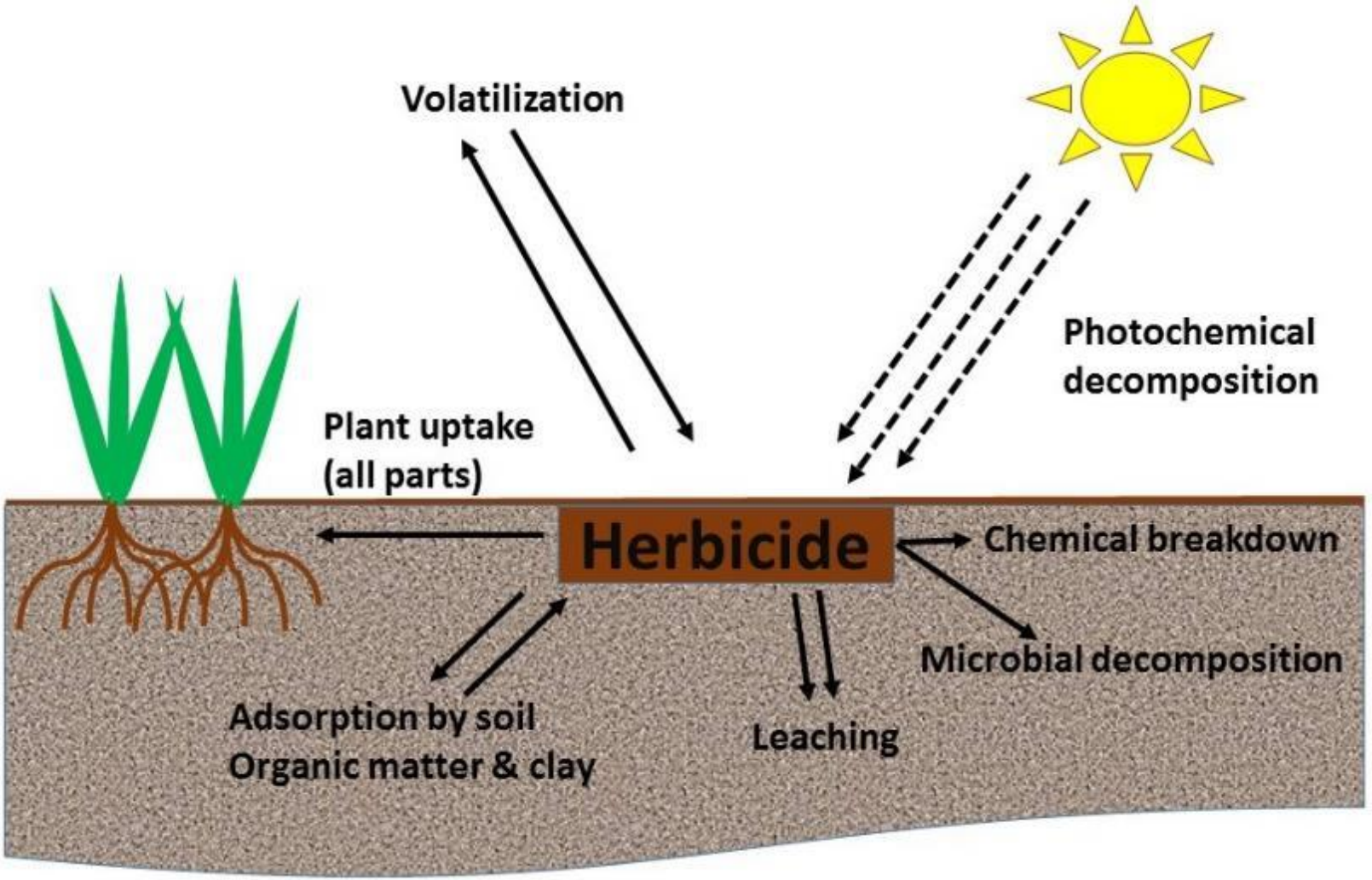
Best weed control strategy is to prevent weed emergence:

- **Bed preparation**
- **Mulches**
- **Preemergence herbicides**

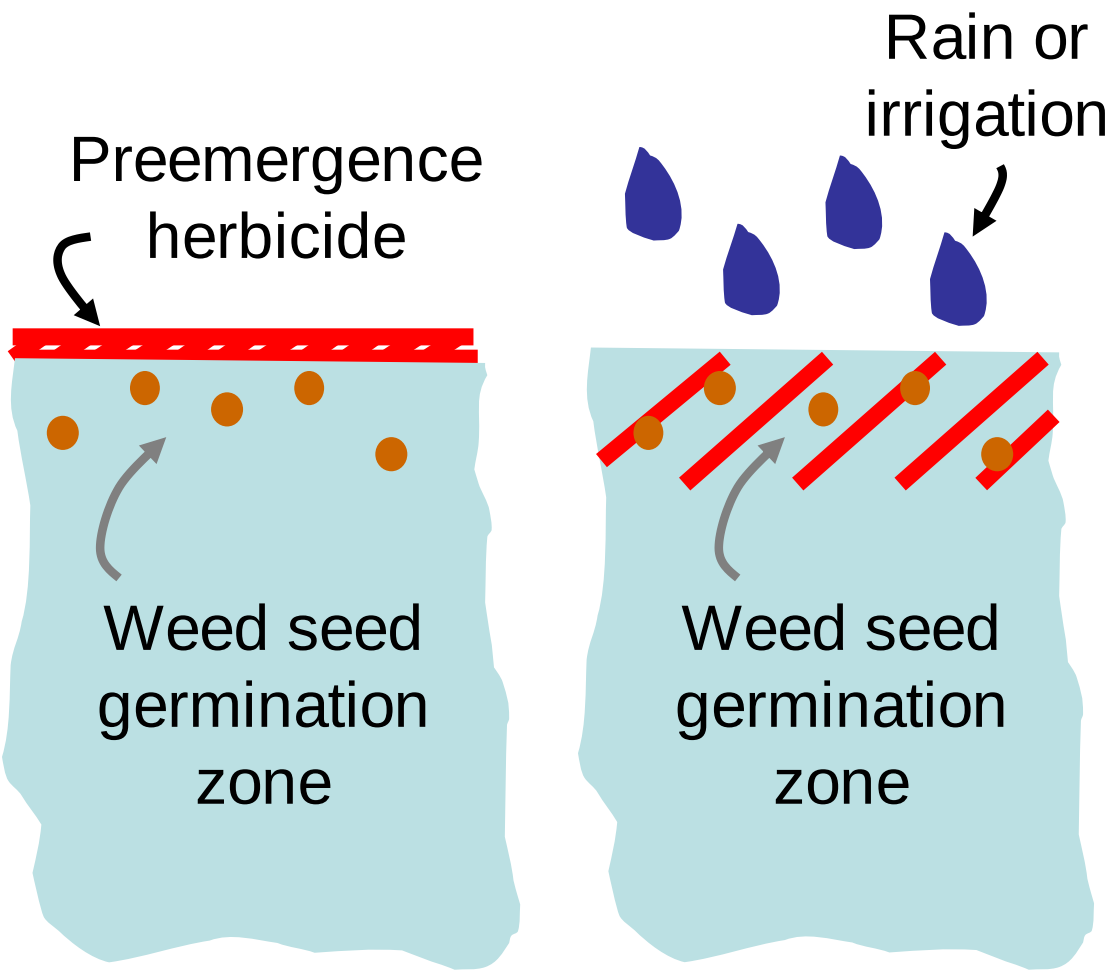
Preemergence herbicides:

- Apply to bare soil or mulch before germination of seeds
- Only effective on weeds that have not yet emerged
- Need water to move (activate) herbicide into seed germination zone

Herbicide fate after application



Preemergence herbicide activation



Benefits:

Herbicide move to the weed seed germination zone

Herbicide protected from

- volatilization
- photodegradation

Lack of PRE Herbicide Performances

- Applied after weed emergence!
- No activating rainfall / irrigation
- Excessive rain after application…
- Poor site drainage
- Gaps in herbicide ground coverage
- Herbicide rate not adapted to soil texture
- Humidity and heat will speed up microbial degradation…

Blueberry Chemical Weed Control

❑ Spring Preemergence for Grass Control

Herbicide	Annual		Perennial	
	Grasses	Broadleaf	Grasses	Broadleaf
Devrinol [1]	G	P	nc	nc
Surflan [1]	G	P	nc	nc
Solicam	G	F	F	nc
Dual Magnum[1,2]	G	F	sedge	nc

[1] indicates label for new planting and established planting

[1] 24 (c) Special Local Need label for New Jersey

Blueberry Chemical Weed Control

❑ Preemergence for Broadleaf Control

Herbicide	Annual		Perennial	
	Grasses	Broadleaf	Grasses	Broadleaf
Princep / Karmex	nc / F	G	nc	nc
Callisto [2]	nc	G	nc	nc
Chateau [2]	F	G	nc	nc
Sinbar	F	G	F	nc
Casoron	F	G	F	F
Matrix SG	F	G	sedges	dandelion
Zeus Prime XC	F	G	sedges	nc

[2] indicates label for new planting and established planting

Bearing blueberry

YEAR 2

- **Light weed pressure**
- **Target : annual broadleaf and grass weeds**
- **Spring application up to T3**

Herbicide	Rate lb ai/A	Cost ($)/A banded application
Dual Magnum	1.26	5.5
Chateau	0.35	20.5
Gramoxone SL 2.0 + NIS	0.75	4.0
Total /A		**30.0**

Bearing blueberry

- **Heavy grass infestation**
- **Target : annual broadleaf and grass weeds**
- **Early spring application (before T3)**

Herbicide	Rate lb ai/A	Cost ($)/A banded application
Solicam	1.97	29.5
Chateau	0.35	20.5
Gramoxone SL 2.0 + NIS	0.75	4.0
Total /A		**53.5**

Bearing blueberry

- **Nutsedge infestation**
- **Target : annual broadleaf / grass weeds + nutsedge**
- **Early spring application (before T3)**

Herbicide	Rate lb ai/A	Cost ($)/A banded application
Solida	0.0625	23.0
Dual Magnum	1.26	5.5
Zeus XC	0.38	9.0
Gramoxone SL 2.0 + NIS	0.75	4.0
Total /A		**41.5**

Bearing blueberry

- **Perennials: nutsedge / goldenrod / Canada thistle**
- **Target : annual grass weeds + perennials**
- **Split program (Fall + spring before T3)**

Timing	Herbicide	Rate lb ai/A	Cost ($)/A banded application
Fall	**Casoron 4G**	4.00	84.0
	Gramoxone SL 2.0	0.75	4.0
Spring	Dual Magnum	1.26	5.5
	Princep 4L	2.00	3.5
	Gramoxone SL 2.0	0.75	4.0
Total /A			**101.0**

SUMMARY

- ✓ Pick up the right herbicide for the right weed!
- ✓ Use at least 2 different products with 2 different MOA
- ✓ Start clean !!! – very little residues on soil surface
- ✓ Adjust rate to soil type and organic matter
- ✓ Uniform spray coverage – calibration + nozzle choice
- ✓ Activation is required – at least ½" rain 7 DAT
- ✓ Don't disturb the ground!
- ✓ Wash off of PRE herbicide with drip irrigation…

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Strategies for Early Season Blueberry Disease Management

Peter V. Oudemans
Professor
Plant Biology

Philip E. Marucci
Blueberry and Cranberry
Research and Extension Center

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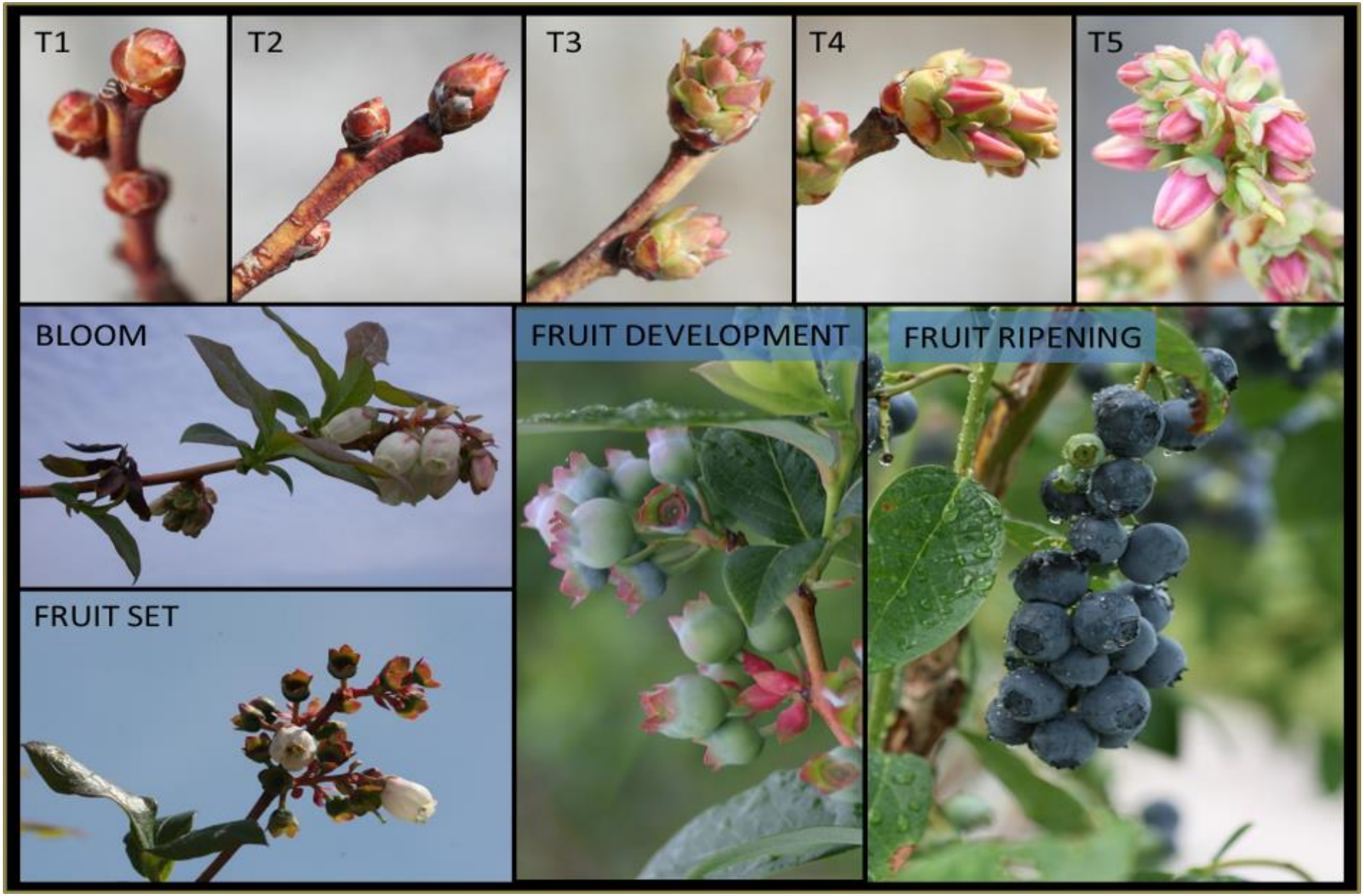
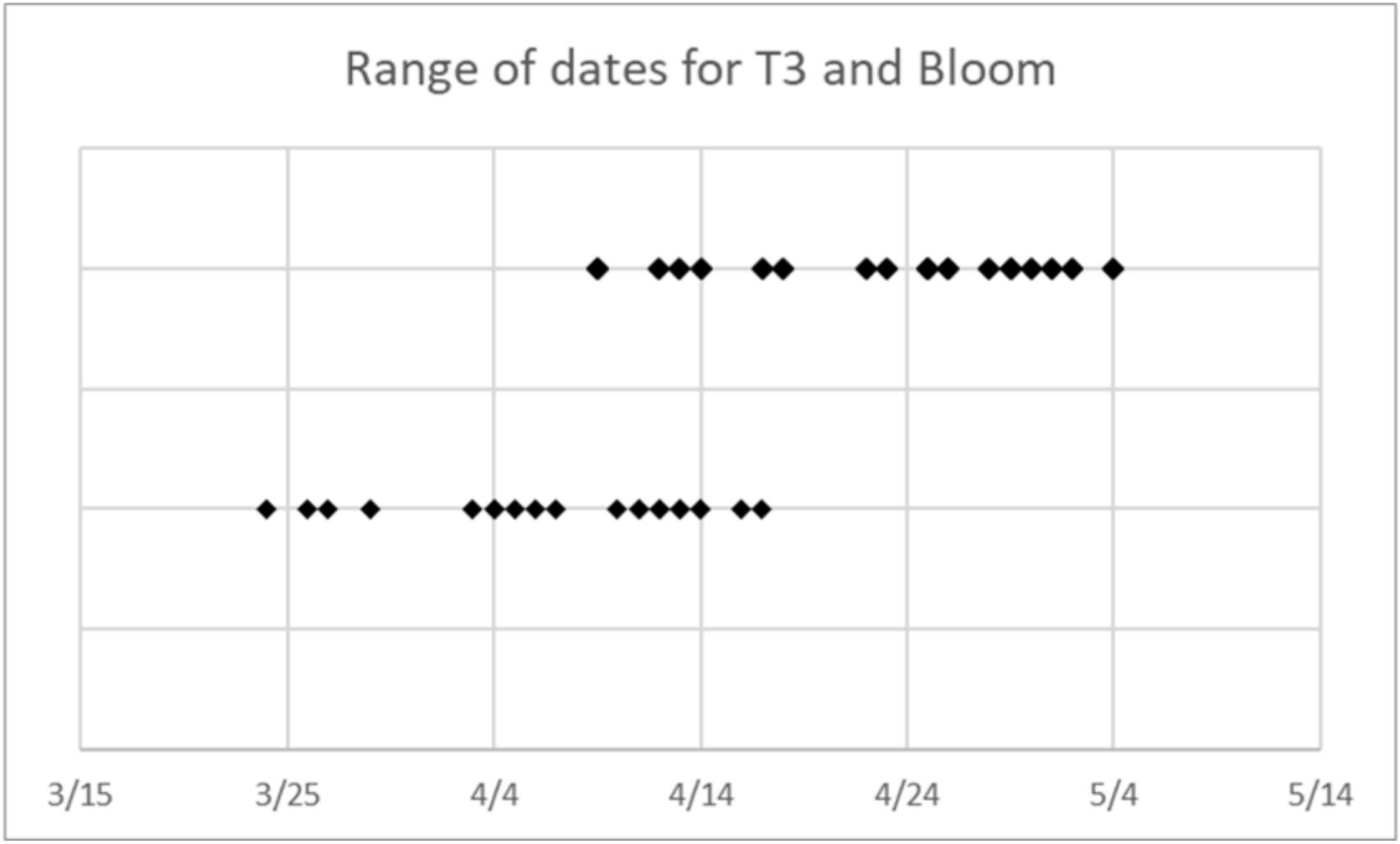
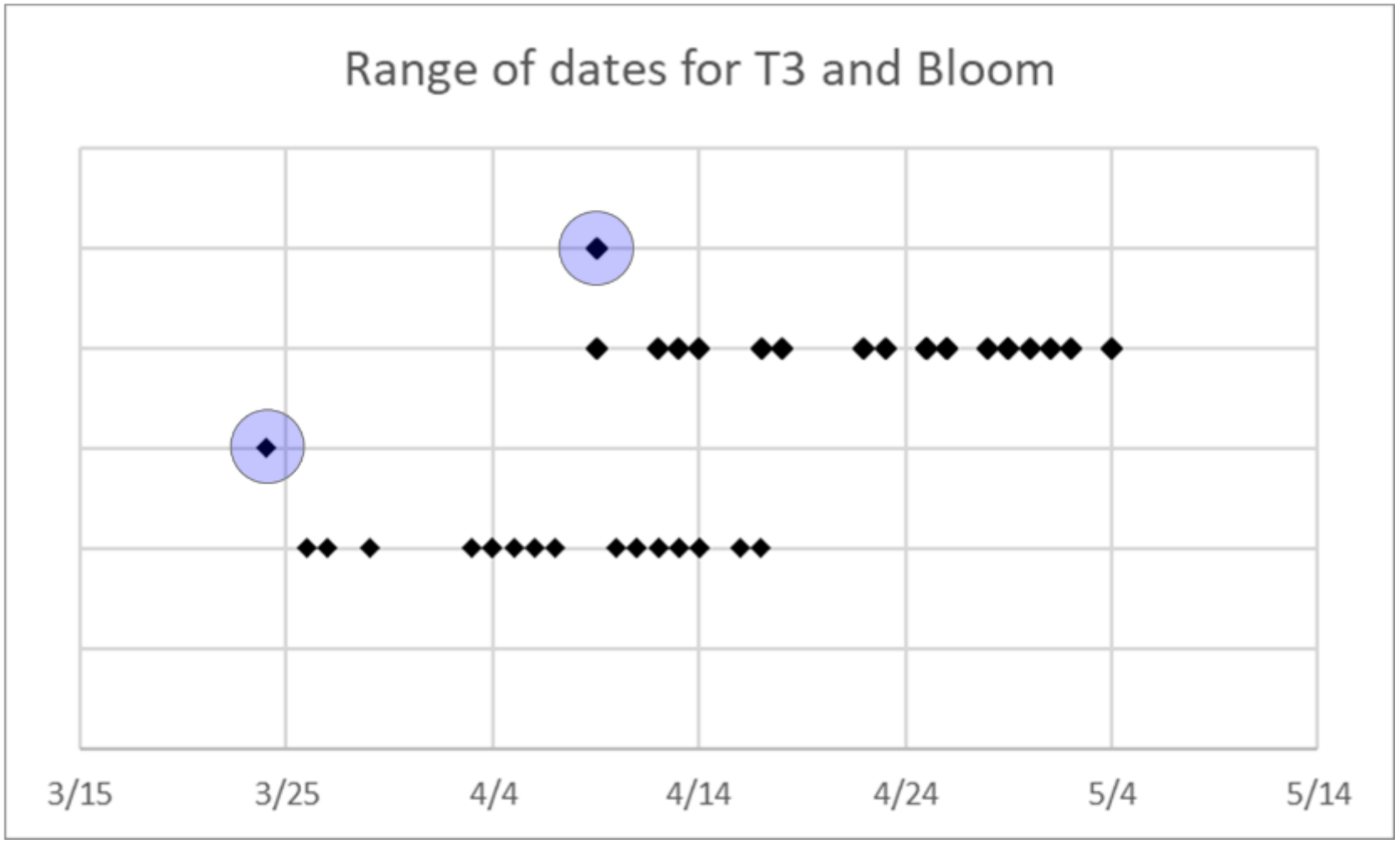
Experiment Station

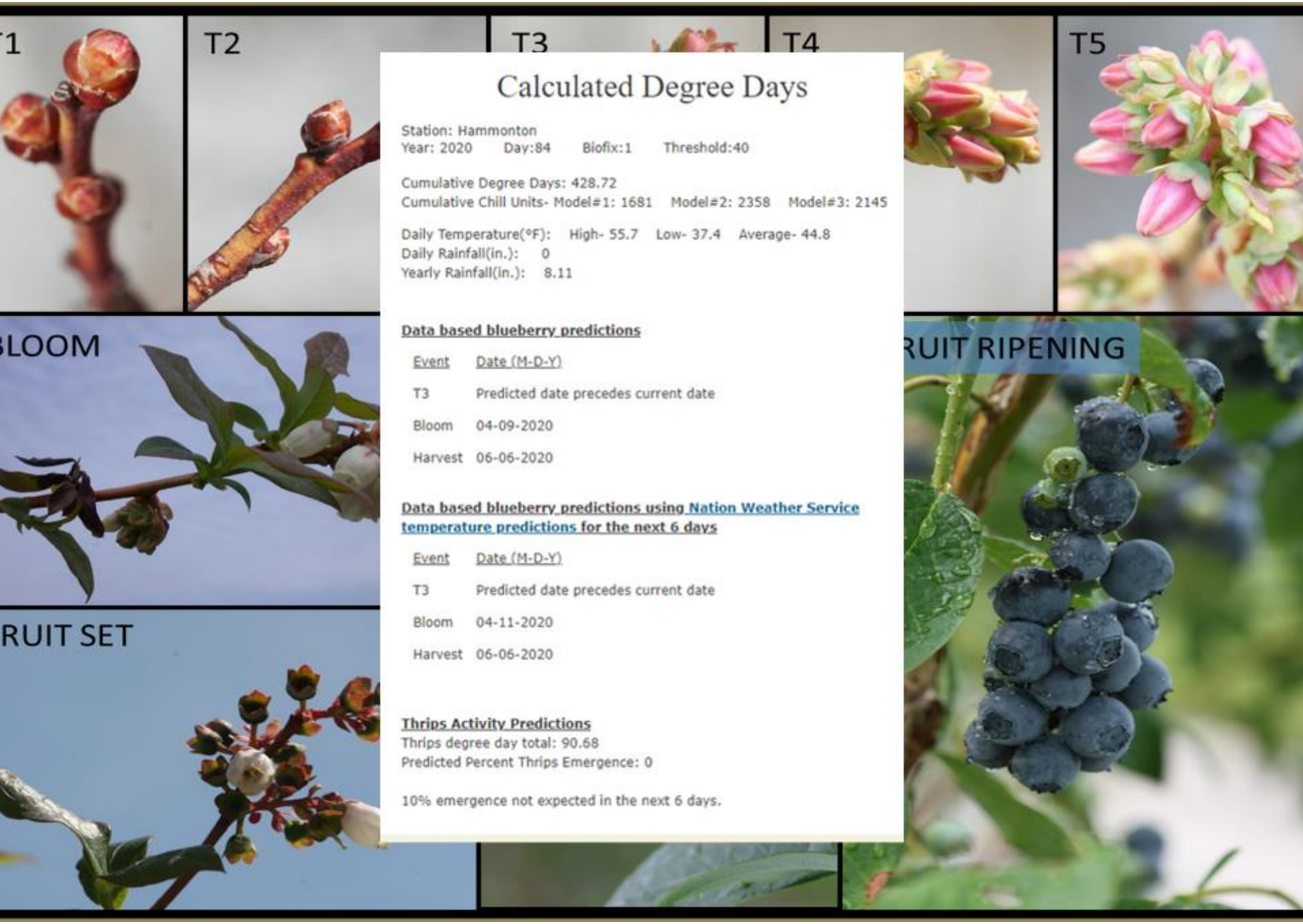

T1
T2
T3
T4
T5
BLOOM
FRUIT SET
FRUIT DEVELOPMENT
FRUIT RIPENING

Dates for T3 and Bloom from 2000-2019



Dates for T3 and Bloom from 2000-2020





Calculated Degree Days

Station: Hammonton
Year: 2020 Day:84 Biofix:1 Threshold:40

Cumulative Degree Days: 428.72
Cumulative Chill Units- Model#1: 1681 Model#2: 2358 Model#3: 2145

Daily Temperature(°F): High- 55.7 Low- 37.4 Average- 44.8
Daily Rainfall(in.): 0
Yearly Rainfall(in.): 8.11

Data based blueberry predictions

Event	Date (M-D-Y)
T3	Predicted date precedes current date
Bloom	04-09-2020
Harvest	06-06-2020

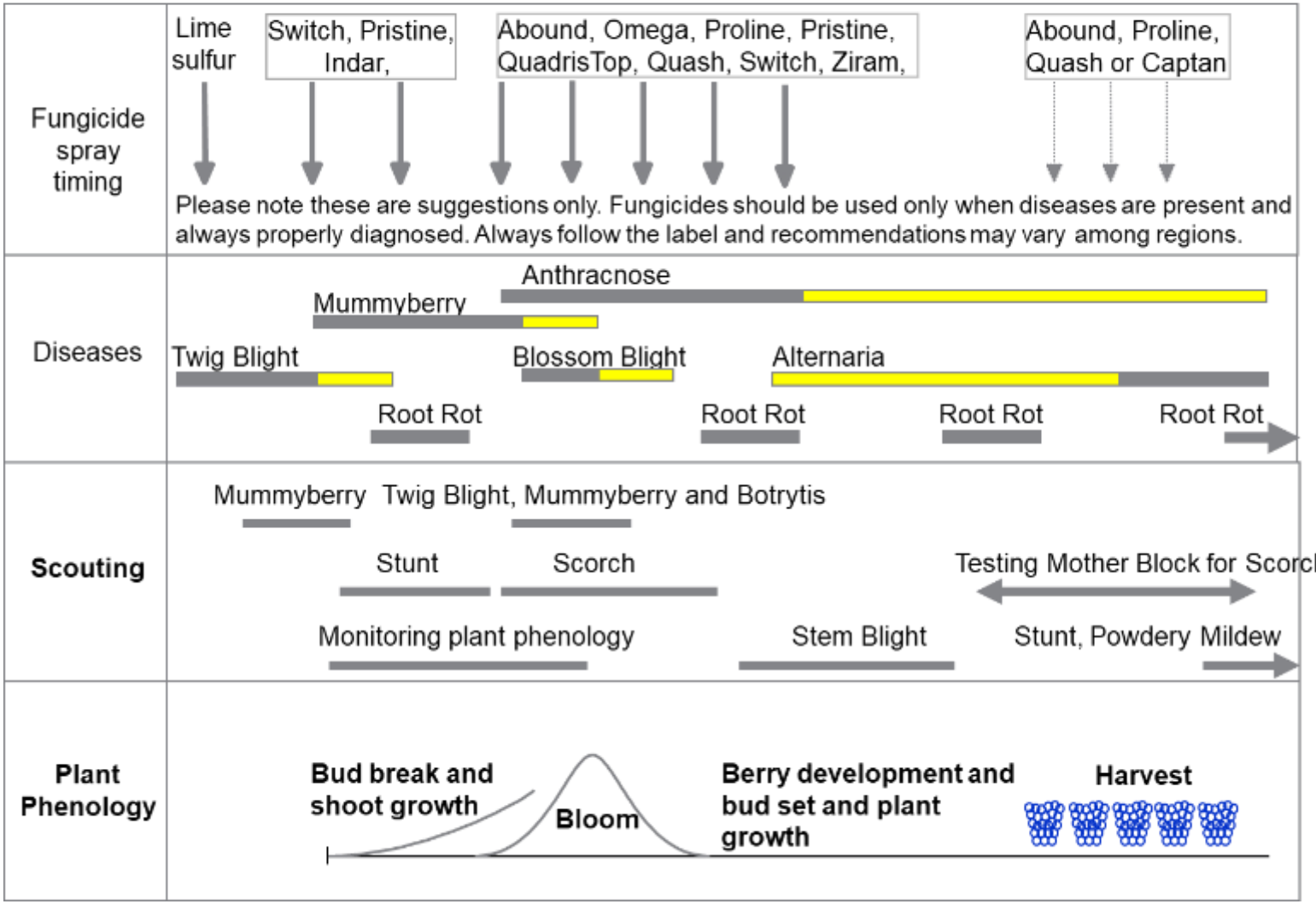
Data based blueberry predictions using Nation Weather Service temperature predictions for the next 6 days

Event	Date (M-D-Y)
T3	Predicted date precedes current date
Bloom	04-11-2020
Harvest	06-06-2020

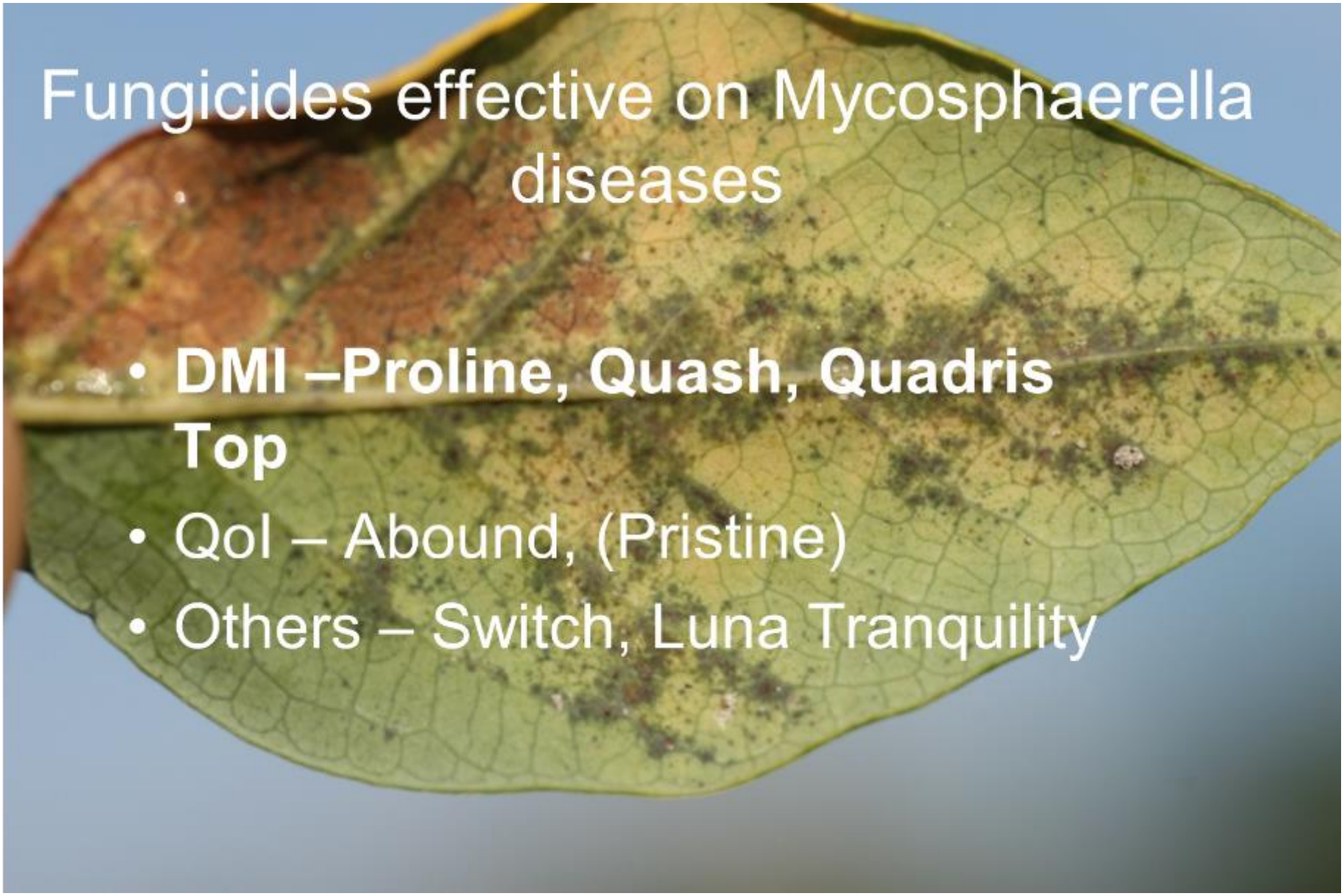
Thrips Activity Predictions
Thrips degree day total: 90.68
Predicted Percent Thrips Emergence: 0

10% emergence not expected in the next 6 days.

In Season Blueberry Disease Management Northeastern USA



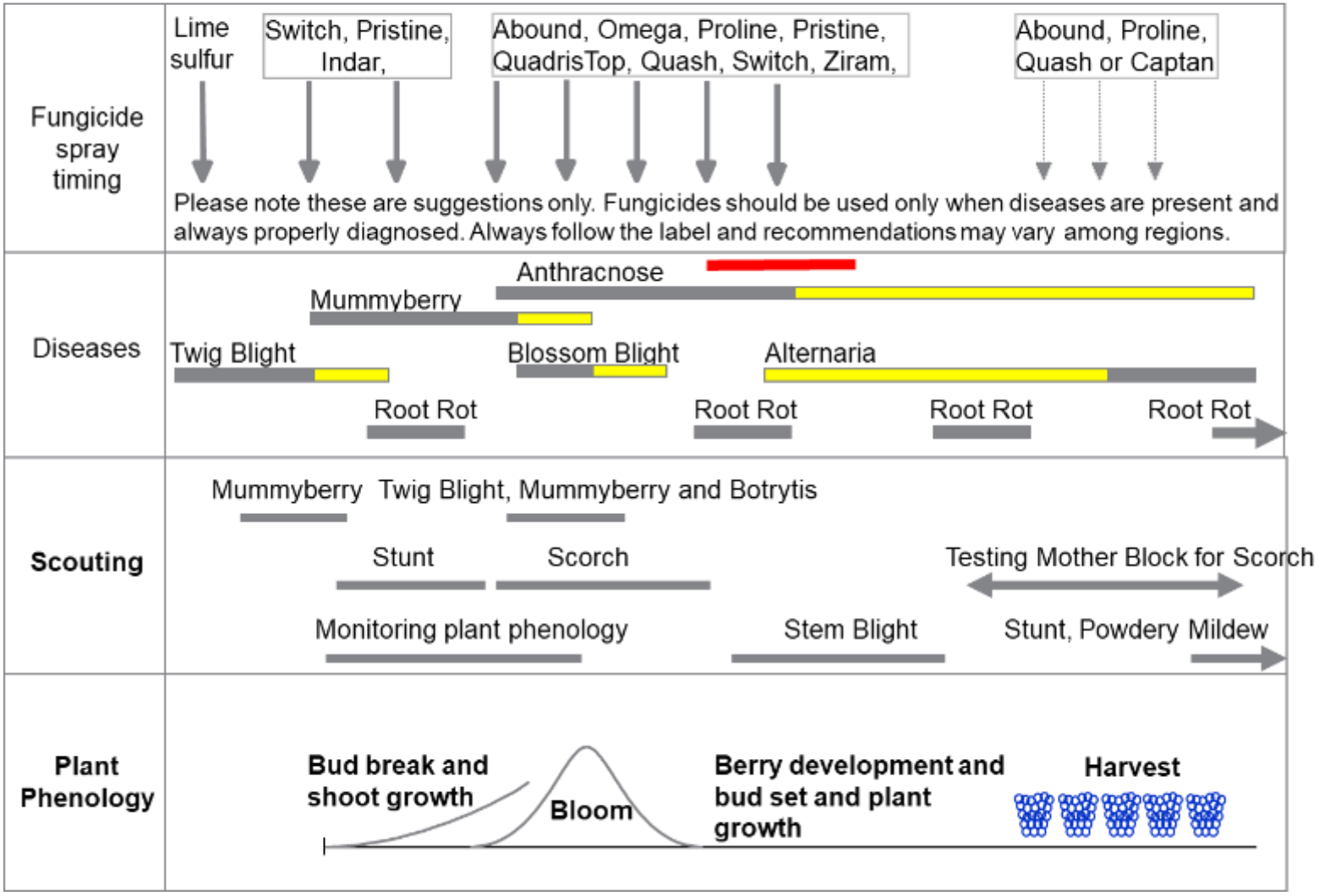
Phomopsis Targets



Fungicides effective on Mycosphaerella diseases

- **DMI –Proline, Quash, Quadris Top**
- QoI – Abound, (Pristine)
- Others – Switch, Luna Tranquility

In Season Blueberry Disease Management Northeastern USA



DMI Fungicides

Active		Activity against Anthracnose
Fenbuconazole	Indar	Very poor
Propiconazole	Bumper, Tilt, Fitness, Topaz	Very poor
Difenconazole	**Quadris Top**	Excellent
Metconazole	**Quash**	Good-Excellent
Prothioconazole	**Proline**	Excellent
Tetraconazole	Mettle	Not tested
Triflumizole	Procur	Not tested

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Blueberry Update for March 26, 2020
IPM Program Status & Pollination

Dean Polk, Chelsea Abegg, Carrie Denson

IPM Program Status

- We are planning a program and are currently scouting.
- All of Rutgers: Research and Extension is doing priority setting and defining essential services, so the program format may change.

What we plan:

- Calling the growers to confirm if you physically want us on your farms.
- Most scouting will be done solo.
- Reports to be left in a protected, but none 'populated' area.
- Electronic report- The report may be scanned in the field and sent to you by email.
- Follow-up by program associates may be done by phone or email.

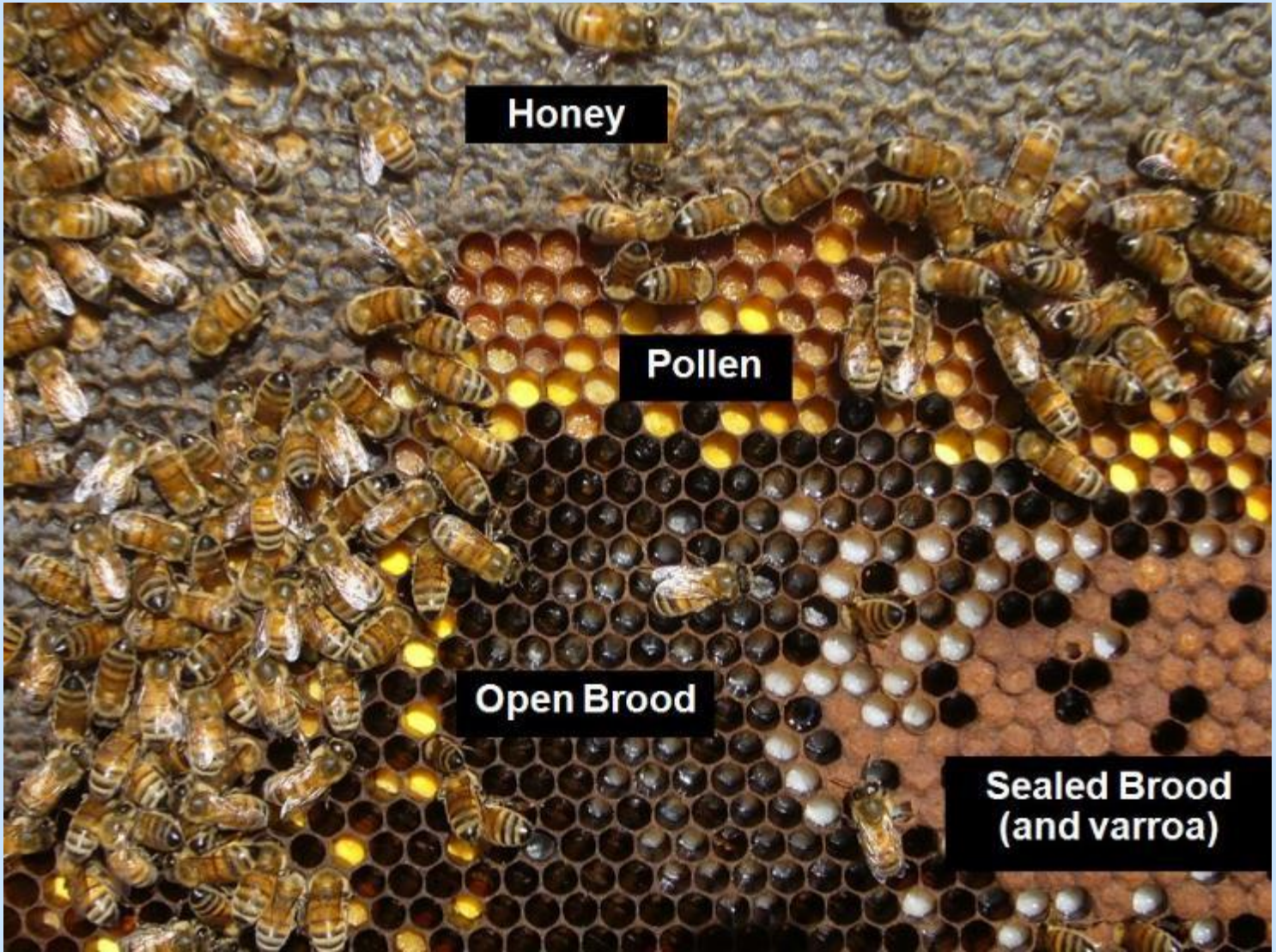
IPM Field Visits

- Possible less scouts, since they will have to work more independently.
- Will be done solo, and drive solo.
- Will not come inside.
- Will keep our distance.

Trouble Shooting Field Visits

- Will be done solo if possible.
- If 1 RCE person needs help, then a maximum of 2 (3 with the grower) & (and keeping our distance).

A Few Word About Bees and Pollination Services

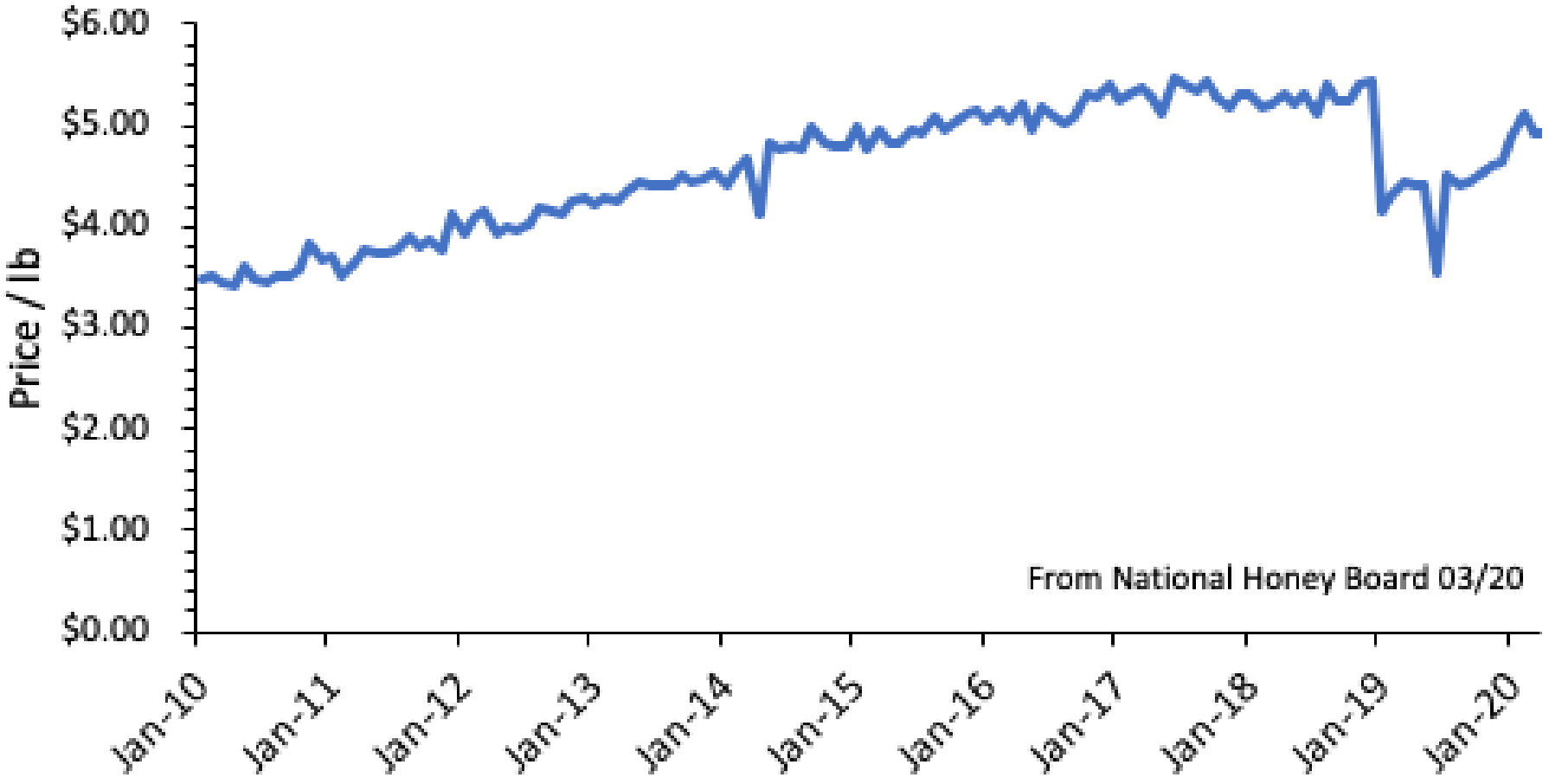


Start of BB Pollination

End of BB Pollination

Some Beekeeper Economics

- We use an average of 2 hives per acre in blueberries, some growers use less, some use more.
- This is about 18,000 hives coming into NJ during mid April – late May.
- Prices might range from $80 to $110 per hive for 2020, or total ~ $1.4 to $2 million.
- In 2018 beekeepers lost ~ $1 million to bee deaths in blueberries.
- Hive replacement cost the beekeeper ~ $250/hive.
- Healthy hives can produce 80 lb of honey/yr


Wholesale Honey Prices 1/2010-3/2020
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00
Price / lb
From National Honey Board 03/20
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20

- At $5/lb honey return = $400/hive @ 80lb/hive
- If a beekeeper sustained 30 – 50% losses –
  * Why pollinate?

Almond Pollination Costs = $216/colony for 8 frames

State	Colonies Shipped for 2019 Almond Bloom	Percent Change from 2018
Idaho	360,127	6%
North Dakota	277,961	4%
Florida	156,432	-27%
Oregon	145,483	-3%
Washington	141,234	1%
Montana	127,373	3%
South Dakota	118,809	9%
Texas	105,497	-22%
Minnesota	77,527	2%
Utah	38,737	14%
Net change for top 10 states		**-2%**

Bee Culture 1/20

So when beekeepers sustain losses and can make a living on alternative income streams, they raise pollination prices or leave the pollination business, which may also raise prices.

Beekeepers are suggesting:

1. 1st Anthracnose application just prior to bees in.
2. Night applications after bees in hives.
3. Drops on field edges?
4. Anecdotal comments from 2019 – Ziram only had little effect on bees?

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IPM Pest Update

Carrie Denson
Program Associate
Twilight March 26th, 2020

Scouts

- No returning scouts this year, moving along with interviewing.
- Will have some guidelines that we will need to follow, but we will work them out in this coming month.
- Field Scouting: I have already been out in the fields this past week.

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Week Ending 3/20

Report Totals for Week Ending 3/20

Farmer Sites 6 Total	Cranberry % Bud Damage	Cranberry Weevil #per bush	Leafroller # per bush
Avg	20%	1.7	0.1
Max	40%	9.6	0.3

First Cranberry Weevil was capture on March 20th.

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Week Ending 3/26

Report Totals for Week Ending 3/26

Farmer Sites 10 Total	Cranberry % Bud Damage	Cranberry Weevil #per bush	Leafroller # per bush
Avg	20%	.52	0.1
Max	40%	3	0.3

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Food Safety Letter

- If you are part of the IPM program and you need a food safety letter explaining your involvement with the program we be happy to help.

If you need me or have any questions please call me at 609-313-2406.

Lets have a great season!!!

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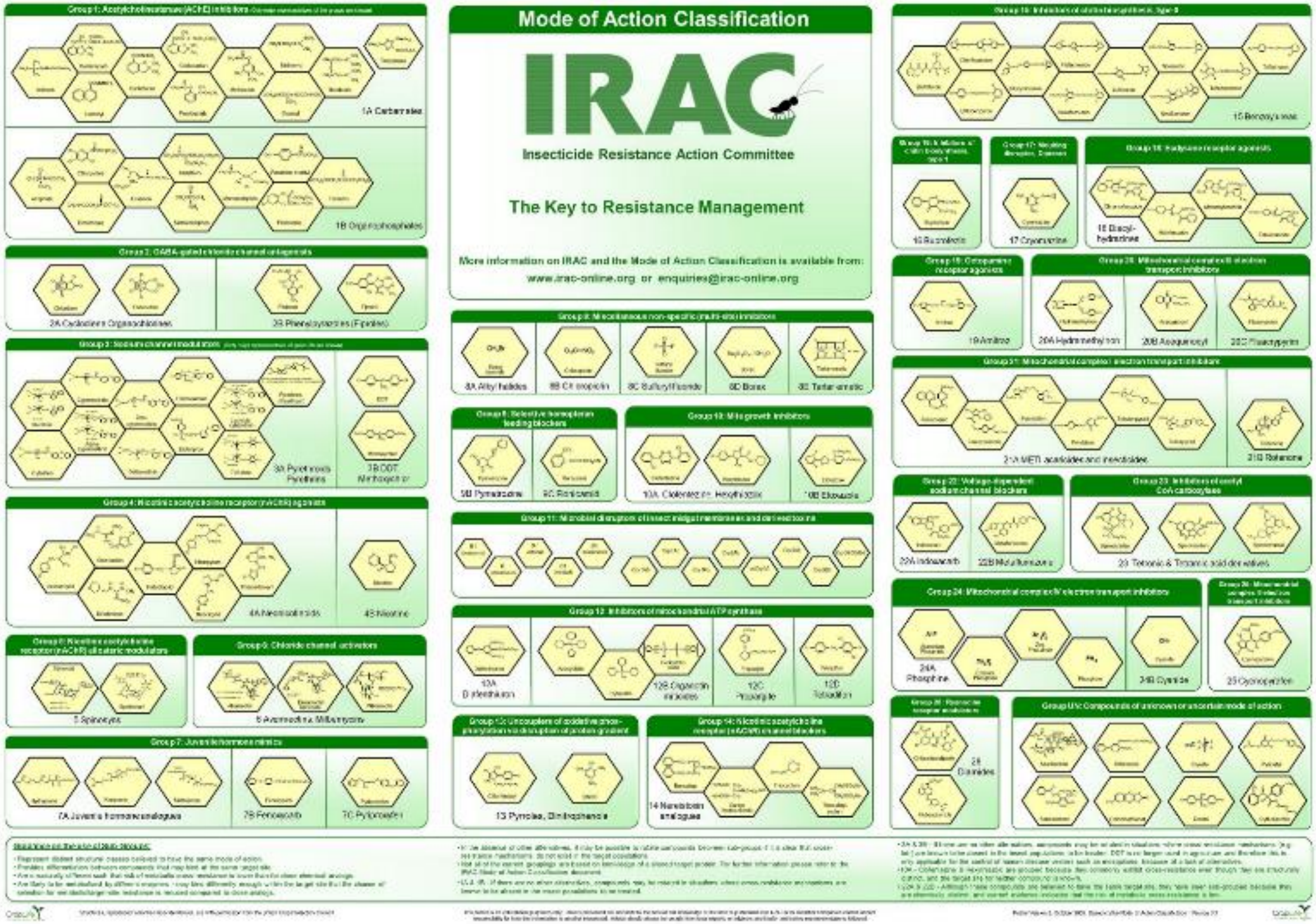
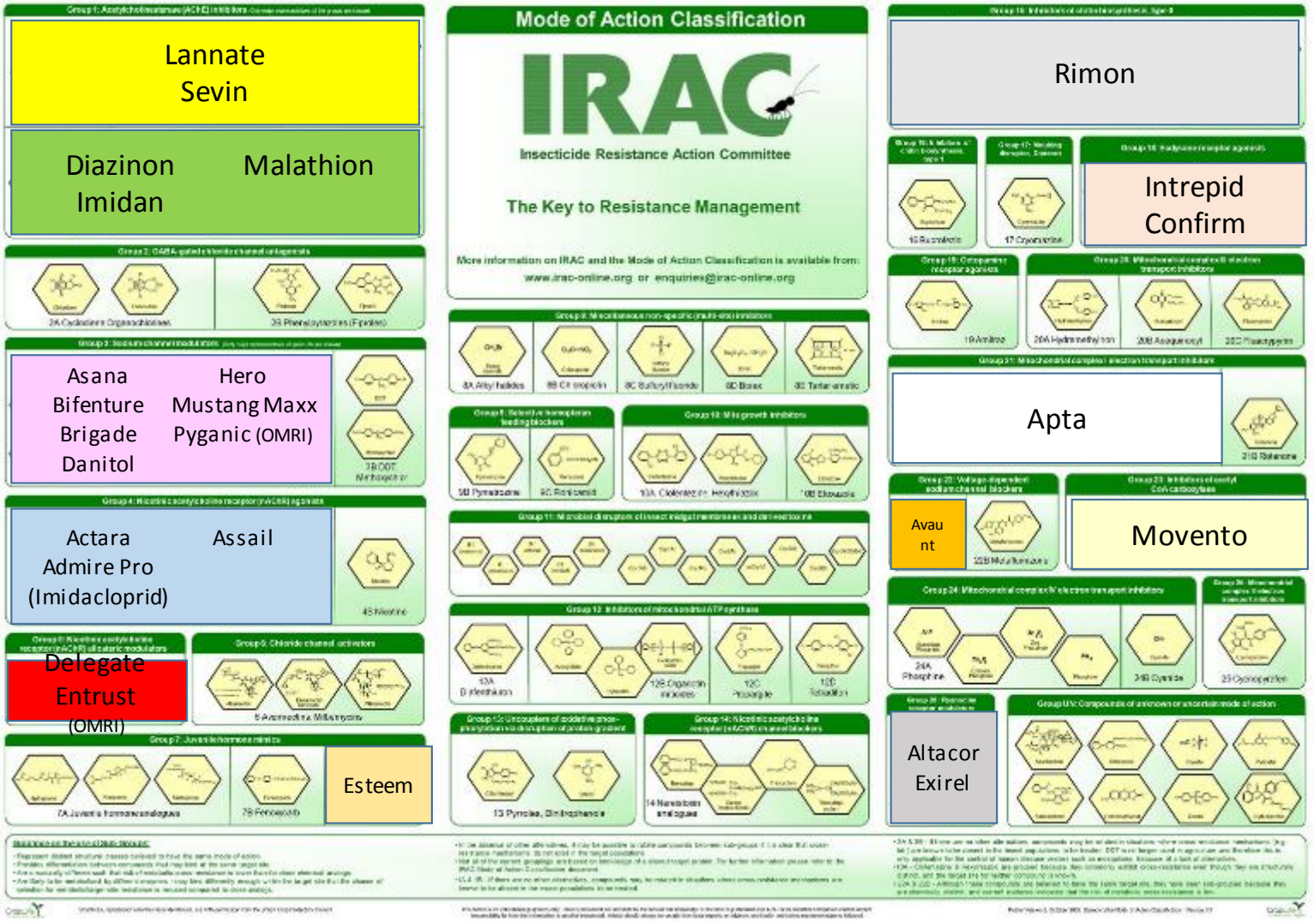
2020 BLUEBERRY INSECT PEST RECOMMENDATIONS FOR NEW JERSEY

Cesar Rodriguez-Saona

P.E. Marucci Blueberry/Cranberry Research and Extension Center



Mode of Action Classification
IRAC
Insecticide Resistance Action Committee
The Key to Resistance Management
More information on IRAC and the Mode of Action Classification is available from:
www.irac-online.org or enquiries@irac-online.org
1A Carbamates
1B Organophosphates
2A Cyclodiene Organochlorines
2B Phenylpyrazoles (Fiproles)
3A Pyrethroids Pyrethrins
3B DDT Methoxychlor
4A Neonicotinoids
4B Nicotine
5 Spinosyns
6 Avermectins, Milbemycins
7A Juvenile hormone analogues
7B Fenoxycarb
7C Pyriproxyfen
8A Alkyl halides
8B Chloropicrin
8C Sulfuryl fluoride
8D Borax
8E Tartar emetic
9B Pymetrozine
9C Flonicamid
10A Clofentezine, Hexythiazox
10B Etoxazole
12A Diafenthiuron
12B Organotin miticides
12C Propargite
12D Tetradifon
13 Pyrroles, Dinitrophenols
14 Nereistoxin analogues
15 Benzoylureas
16 Buprofezin
17 Cyromazine
18 Diacylhydrazines
19 Amitraz
20A Hydramethylnon
20B Acequinocyl
20C Fluacrypyrim
21A METI acaricides and insecticides
21B Rotenone
22A Indoxacarb
22B Metaflumizone
23 Tetronic & Tetramic acid derivatives
24A Phosphine
24B Cyanide
25 Cyenopyrafen
28 Diamides


Mode of Action Classification
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www.irac-online.org or enquiries@irac-online.org
Lannate
Sevin
Diazinon
Malathion
Imidan
Asana
Bifenture
Brigade
Danitol
Hero
Mustang Maxx
Pyganic (OMRI)
Sivanto
Actara
Admire Pro
(Imidacloprid)
Assail
Delegate
Entrust
(OMRI)
Esteem
Rimon
Intrepid
Confirm
Apta
Avaunt
Movento
Altacor
Exirel
1
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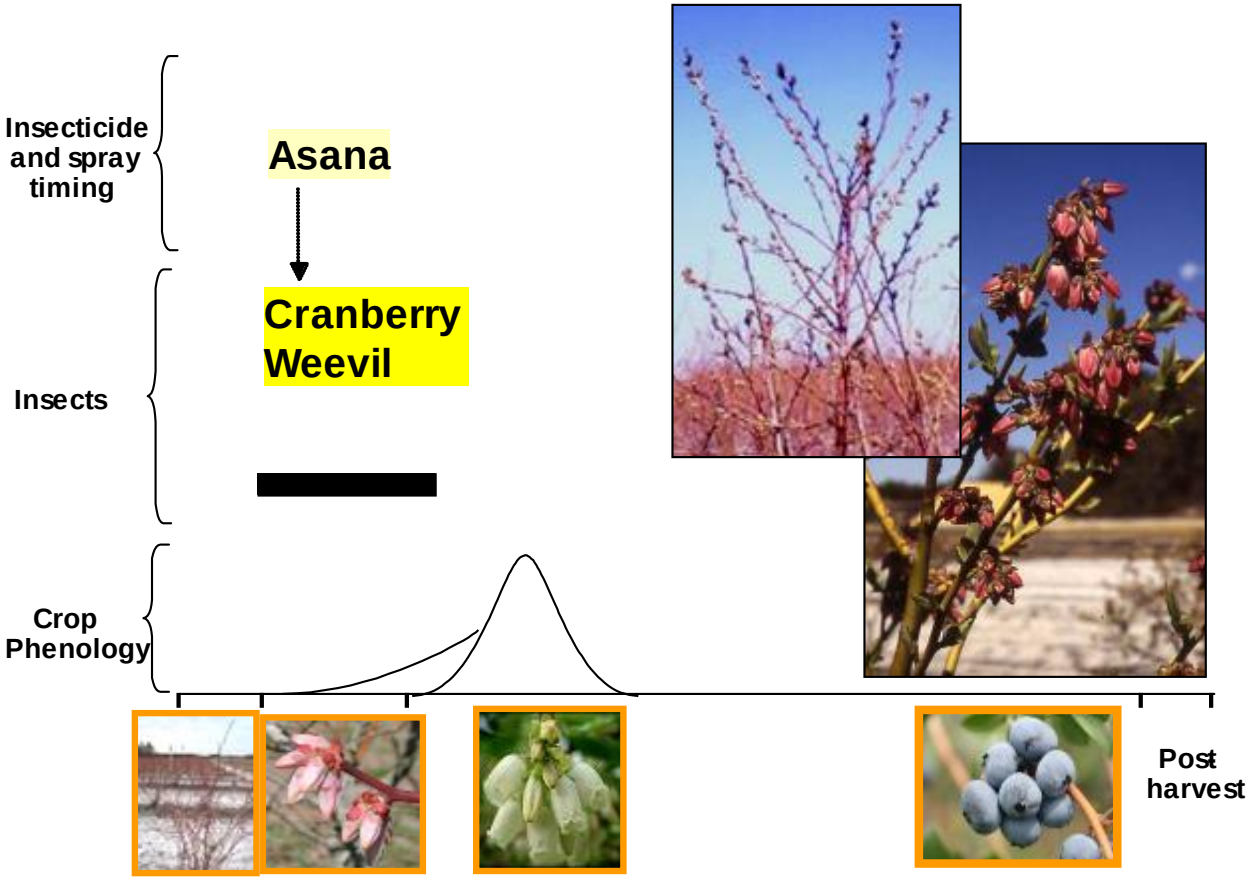
11, 12
13

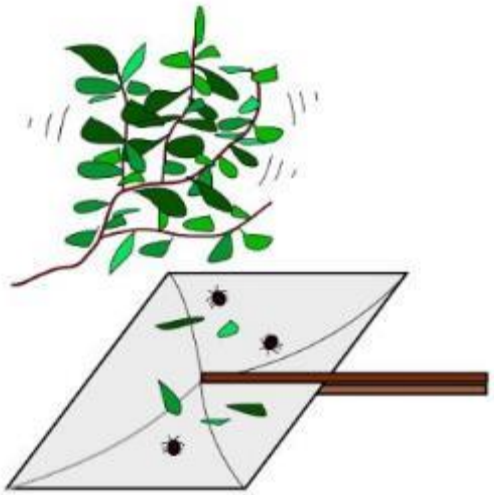
BUD-BREAK TO BLOOM



CRANBERRY WEEVIL

- Small size - 1/16 inch.
- Brown beetle with white marks on elytra.
- Mouthparts on a short snout.
- Overwinters in wooded areas and unkempt fields.
- Active on bushes as early as bud swell.

CRANBERRY WEEVIL



Threshold:

5 weevils per bush or at least 20% injured clusters

Control:

Avaunt at 6 oz/A
Asana at 6 to 8 oz/A
Brigade WSB at 5.3 to 16 oz/A
Mustang Max at 4 fl oz/A
Imidan 70WSB at 1.33 lb/A

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Entomology Program

Pest Management Information

The focus of the extension program is to disseminate research-based information to other research and extension specialists, county agricultural agents, growers, various levels of government, and private-industry through an innovative educational program comprising grower meetings, workshops, in-service training sessions, newsletters, and the Internet.

Relevant pest management information is transmitted via the following:

Entomology Program Links

- Pest Management Information
- Projects
- Research

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Any questions?
If you have a question you can unmute yourself.