

Disease Update

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2019-2020

NEW ENGLAND GREENHOUSE FLORICULTURE GUIDE

A Management Guide for
Insects, Diseases, Weeds,
and Growth Regulators

New England Floriculture, Inc. and
the New England Land Grant Universities

\$40.00

New fungicides in the 2020 Guide

****Asperello T34: (*Trichoderma asperellum*) [NC]**

Fusarium RR, Phytophthora/Pythium RR, Rhizoctonia RR

Areca: (fosetyl al) [33]

Phytophthora blight, Pythium, downy mildew

Artavia 2SC: (azoxystrobin) [11]

**Botrytis, downy mildew, fungal ls, Fusarium RR,
foliar Phytophthora, PM, Rhizoctonia RR, rust**

Astun: (Isofetamid) [7]

Botrytis

New fungicides in the 2020 Guide

****Badge X2: (copper oxychloride + hydroxide) [M1]**

bacterial leaf spots

****BotryStop: (*Ulocladium oudemansii*) [BM]**

Botrytis blight

Broadform: (fluopyram + trifloxystrobin) [7+11]

**Botrytis blight, fungal ls, foliar Phyophthora, PM,
Rhizoctonia RR, rust**

FenStop: (fenamidone) [11]

DM, foliar Phyophthora, Phytophthora/Pythium RR

New fungicides in the 2020 Guide

KleenGrow: (ddac) [NC]

most diseases

OxiPhos: (hydrogen peroxide+ phosphoprus acid) [NC]

DM, foliar Phyophthora

Prostar: (flutolanil) [7]

foliar Rhizoctonia, Rhizoctonia RR, rust

****Pvent: (*Gliocladium catenulatum*) [NC]**

Botrytis, Phytophthora/Pythium RR, Rhizoctonia RR,
Scleroinia (white mold)

New fungicides in the 2020 Guide

Pylon: (chlorofenapyr) [IRAC 13]

foliar nematode

****Stargus: (*Bacillus amyloliquefaciens*) [NC]**

Botrytis blight, DM, Fusarium RR, Phytophthora/Pythium RR,
Rhizoctonia RR,

Talaris 4.5 Pro: (thiophanate-methyl) [1]

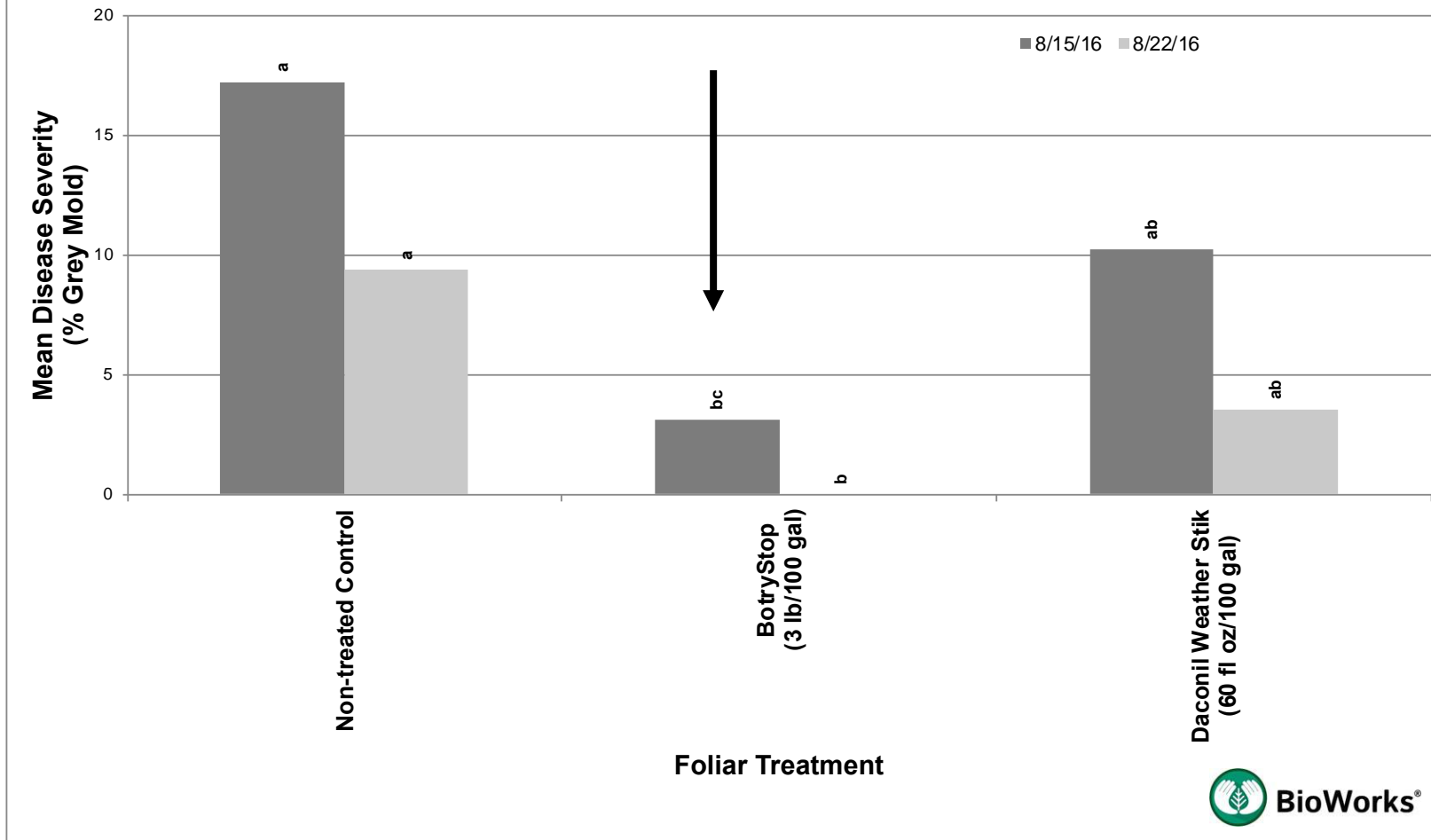
black RR, fungal ls, Fusarium RR, PM, Rhizoctonia RR,
Sclerotinia (white mold)

Trigo: (trifloxystrobin + triadimefon) [11 + 3]

PM, rust

Efficacy of Different Foliar Treatments against Botrytis Grey Mold of Begonia ('Blitz')

(Chris Rose, Victor, NY - 2015)

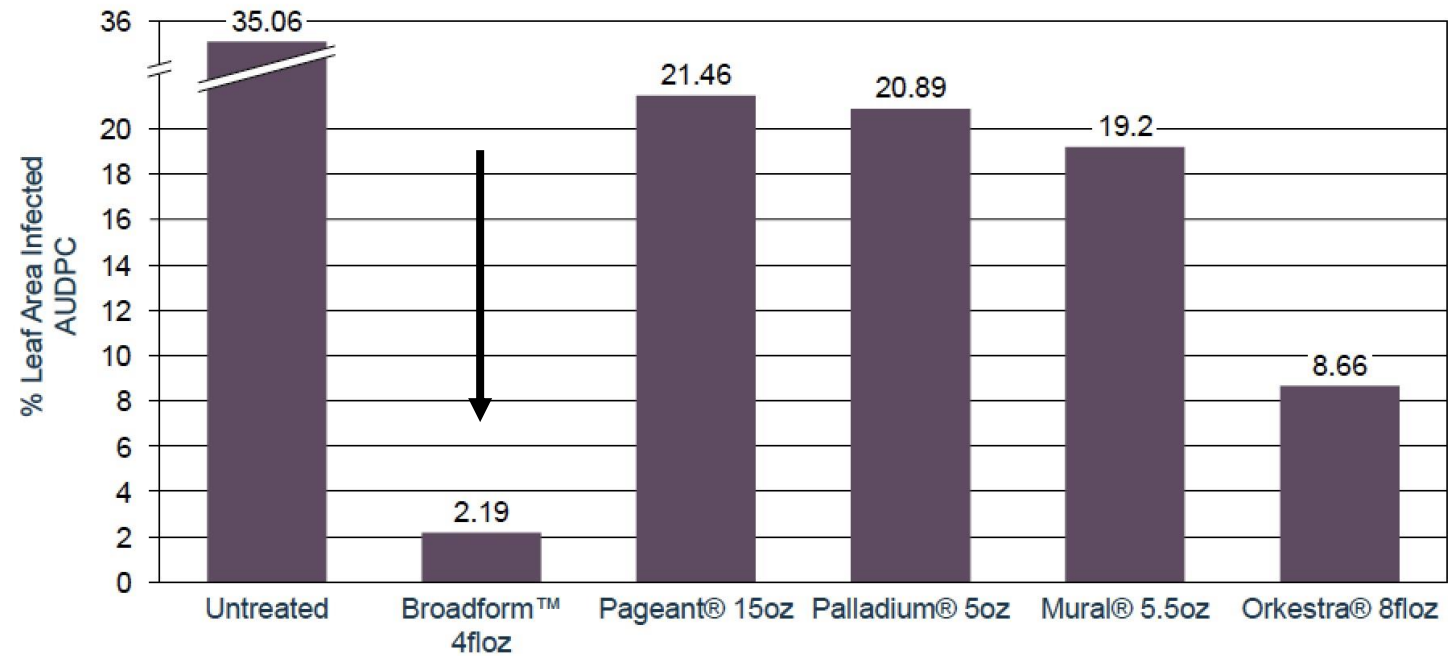


Data – D. Palumbo-Sanders, BioWorks



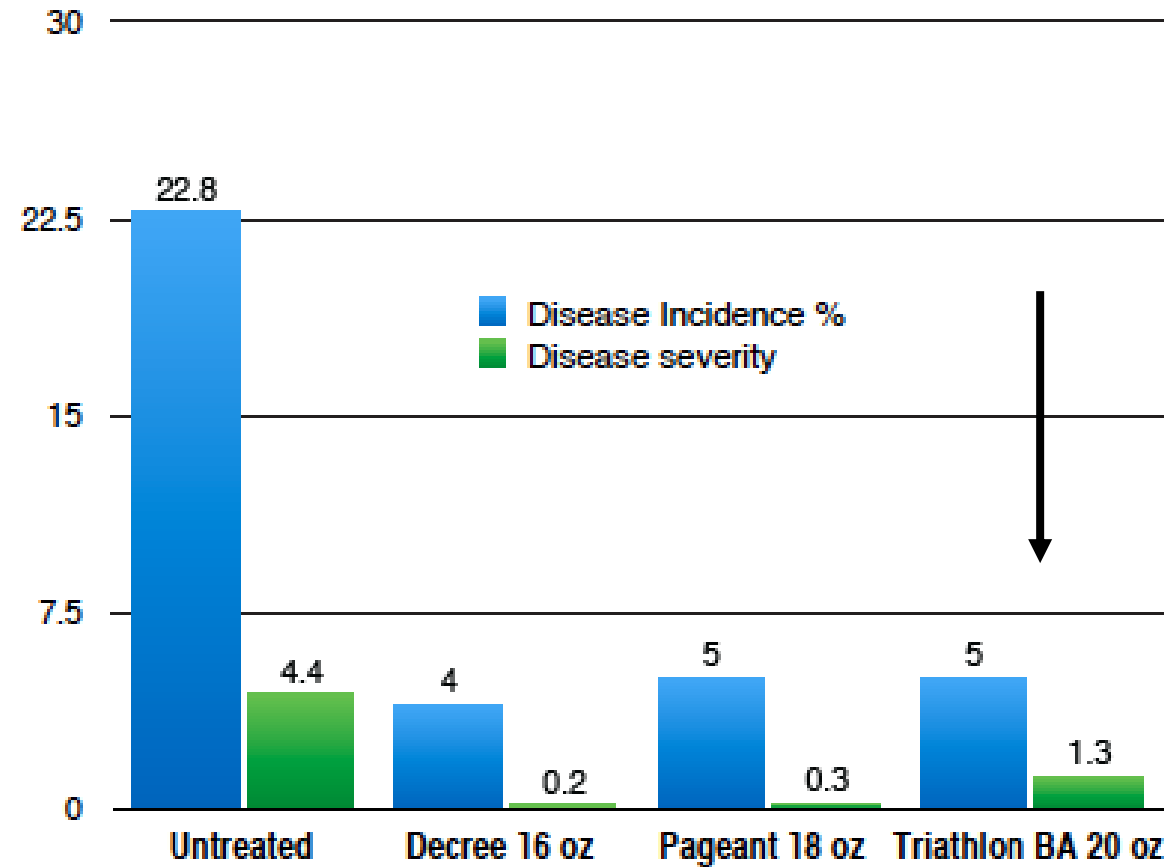
Botrytis on Geranium

Length of Control



Data – A. Palmateer, Bayer US

BOTRYTIS TRIAL



Three applications on a monthly interval
UC Davis, 2014 - PDMR 9:SMF001

Data – PDM reports

Powdery Mildew



Verbena PM

Photo M. Daughtrey



Verbena PM
Reddening and chlorosis

Same one goes to Pumpkins



And also to Petunia – chlorosis from PM



Photo M. Daughtrey

PM products (Biological / Biorational (all OMRI))

potassium bicarbonate: (Kaligreen, MilStop)

neem oil: (Triact)

Sulfur: (Microthiol Disperss)

Bacillus amyloliquifaciens (Double Nickel, Stargus, Triathlon BA)

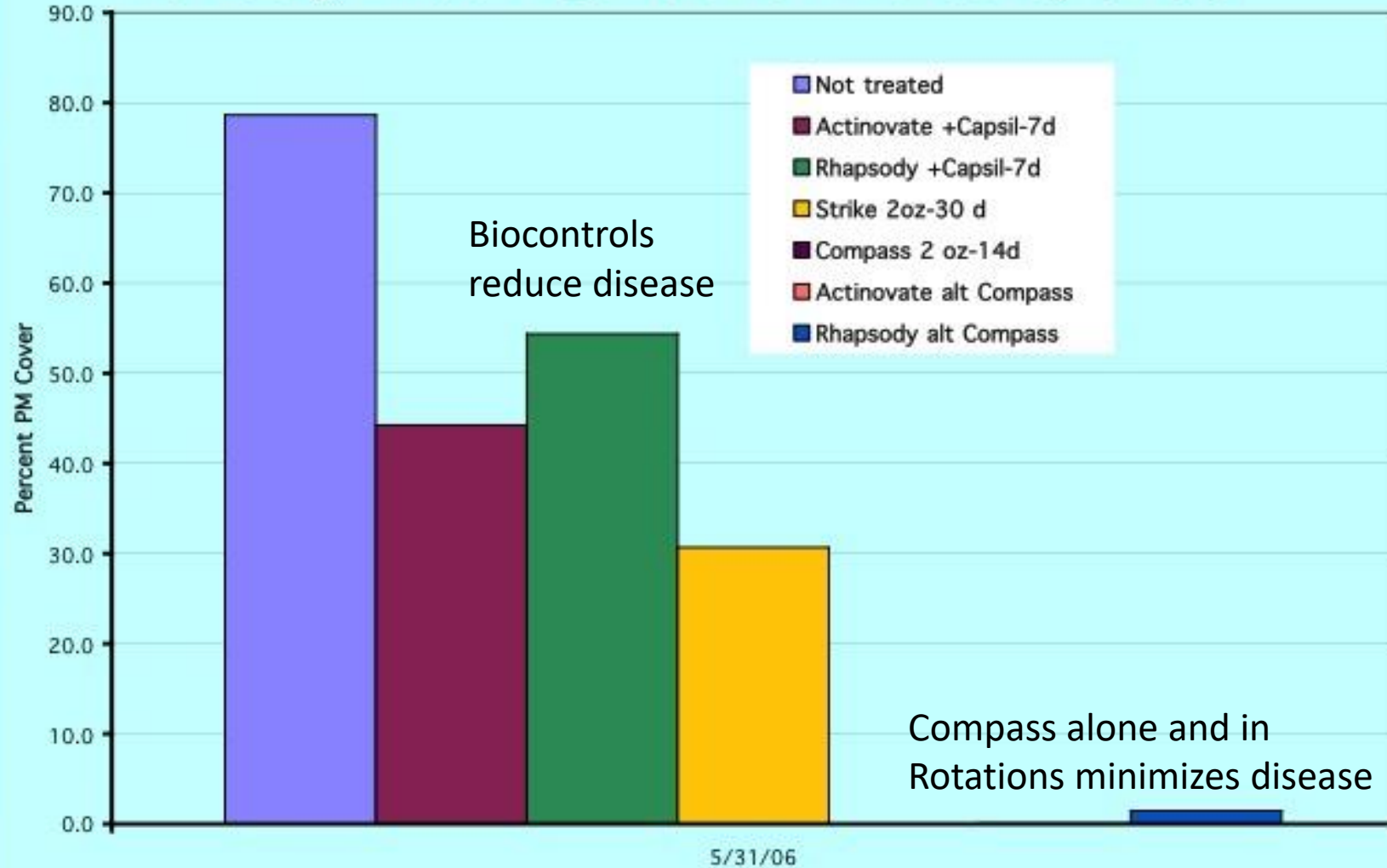
Bacillus subtilis (Cease)

Streptomyces lydicus (Actinovate SP)

Reynoutria sachalinensis (Regalia CG)

Streptomyces and *Bacillus* against PM

Powdery Mildew Control on Verbena, 0406



Downy mildews

Often misdiagnosed or overlooked

Relatively narrow host range

Often angular leaf spot pattern

Sporulation on underside of leaves

Stunting, distortion (esp new growth)

Infected leaves may brown and die

May be seed-borne, or on plugs



**Downy mildew
on
potentilla**



Downy mildew on coleus





Photo M. Daughtrey

July 16, 2018 Syngenta's New Disease Resistant Impatiens



131 - Imara™ XDR Salmon Shades



103
Susc. cvar



132 - Imara™ XDR Salmon Shades

July 16, 2018 Syngenta's New Disease Resistant Impatiens



123 - Imara™ XDR Orange Star



103 susceptible
cultivar



124 - Imara™ XDR Orange Star

DM Fungicides (underside coverage critical)

phosphorus acid (Alude, Rampart, Oxiphos...) [33]

dimethomorph (Stature) [40]

azoxystrobin (Heritage) [11]

cyazofamid (Segway O) [21]

etr Diazole (Truban) [14]

fluopicolide (Adorn) [43]

fenamidone (FenStop) [11]

fosetyl-al (Aliette, Fosetyl-al) [33]

mandipropamid (Micora) [40]

oxathiapiprolin (Segovis) [U15]

DM Combo products

Orvego [40+45]

Mural [11+7]

Orkestra [7+11]

Junction [M1+M2]

Pageant Intrinsic [7+11]

Trigo (11+3)

Others

mancozeb (several)

Coppers (several)

Biological products (all OMRI)

Bacillus amyloliquifaciens

(Double Nickel, Stargus, Triathlon BA)

Bacillus subtilis

(Cease)

Streptomyces lydicus

(Actinovate SP)

Reynoutria sachalinensis

(Regalia CG)

What's wrong here?



Stunting, nutrient deficiency symptoms – Pythium root rot

check for healthy roots



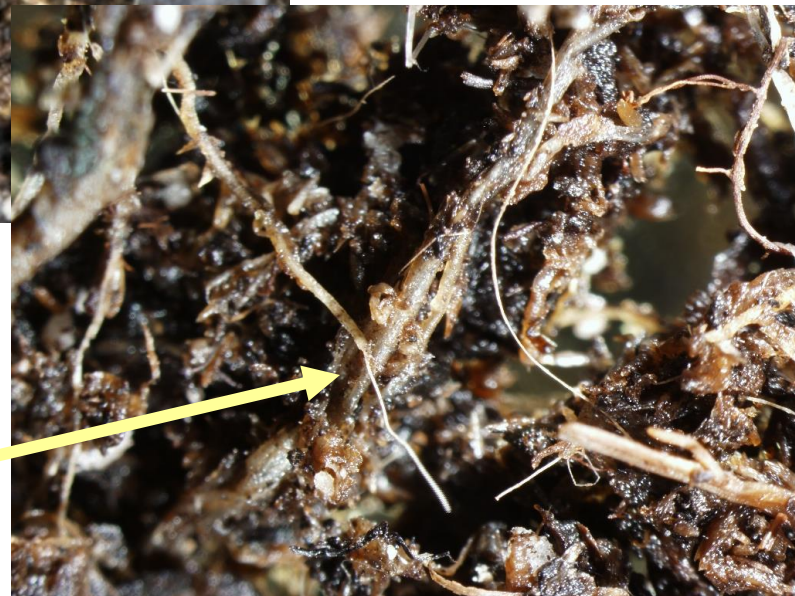
Not good





**Pythium
root rot**

sloughing roots



Pythium/Phytophthora Combo products

Orvego [40+45]

Banrot [14+1]

Mural [11+7] (some)

Biological products (all OMRI)

Bacillus amyloliquifaciens

(Double Nickel, Stargus, Triathlon BA)

***Bacillus subtilis* (Cease)**

***Streptomyces lydicus* (Actinovate SP)**

***Reynoutria sachalinensis* (Regalia CG)**

***Trichoderma sp.* (RootShield Plus)**

Gliocladium catenulatum

(Prestop, PVent)

Edema



Intumescence





Intumescence on tomato





Xanthomonas axonopodis pv. *begoniae*

Bacterial blight on begonia



Photo: B. Kennedy, UK



Xanthomonas axonopodis pv. *begoniae*

LOOKING TOWARDS NEXT SEASON

Disinfection and preparation for next year

Approach:

- All materials have been disinfected
- All greenhouse structures have been washed and disinfected through a two-phased process
- Following disinfection a new substrate has been placed in all pots to start clean

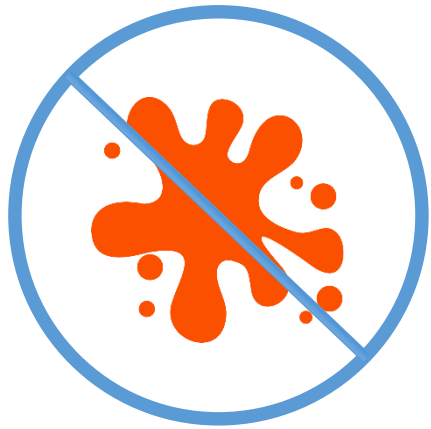
Result:

- We expect this to be the best quality/lowest disease level of any supply to date



INFRASTRUCTURE IMPROVEMENTS

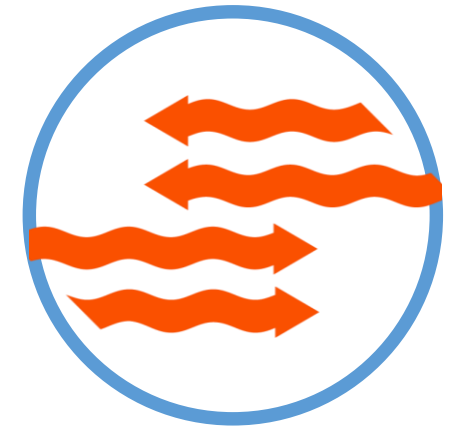
Protect introduction or potential spread from external influences



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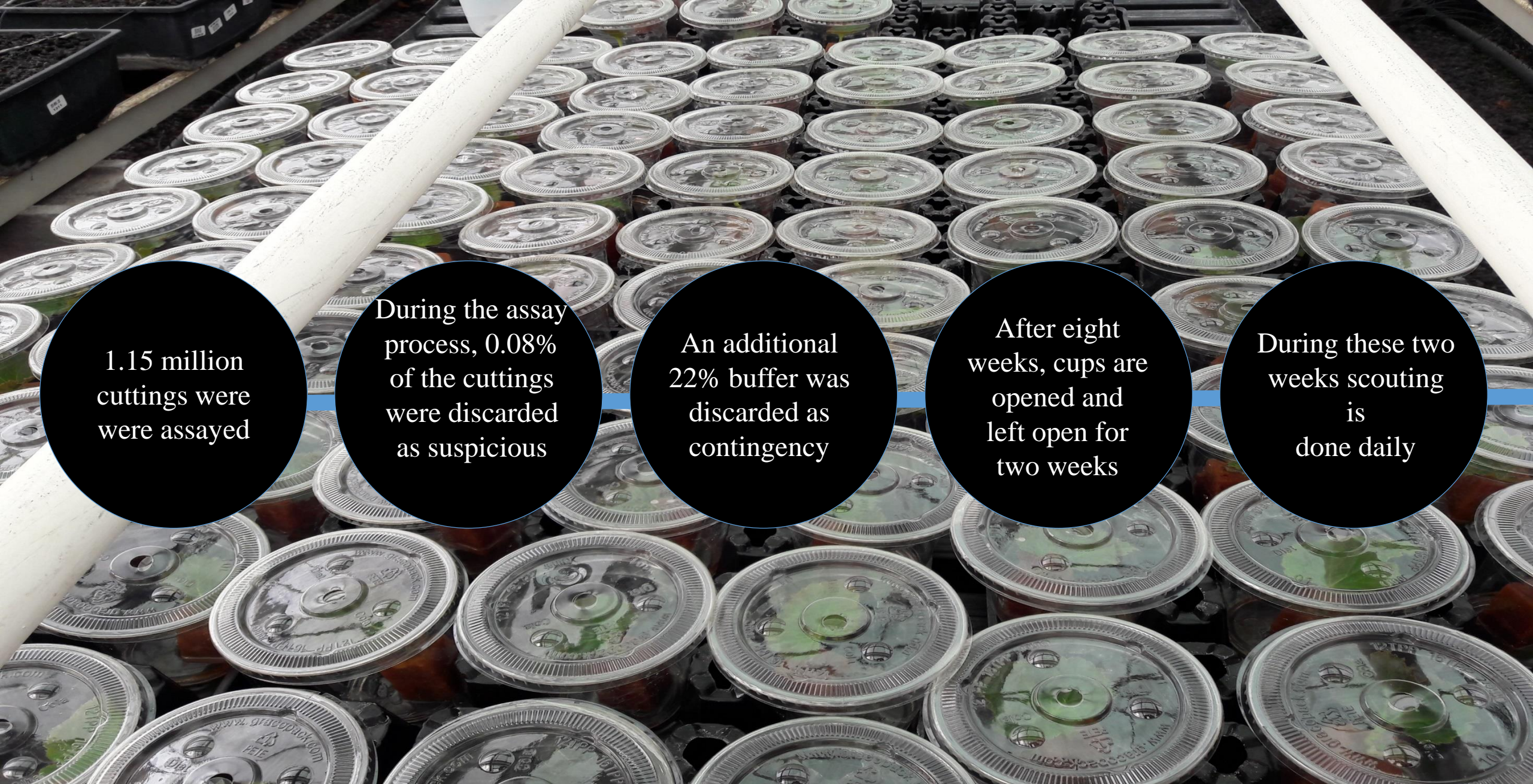
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Gutter systems revamped to prevent splashing of water into the greenhouses and subsequent risk of introduction and/or spread of pathogens

Physical barriers placed between smaller sanitation units to prevent unnecessary contact and disease spread

Enhancement of air flow to promote an active climate to promote optimal growth and development



1.15 million
cuttings were
assayed

During the assay
process, 0.08%
of the cuttings
were discarded
as suspicious

An additional
22% buffer was
discarded as
contingency

After eight
weeks, cups are
opened and
left open for
two weeks

During these two
weeks scouting
is
done daily





PROTOCOL ENHANCEMENTS

Minimal Plant Contact. Small Sanitary Units

- Sanitation units decreased
- Knives are changed per sanitation unit
- Knife disinfection is made with a dishwasher to ensure extreme temperature sanitation, alkaline solution application and removal of organic matter is consistent and thorough
- An encasement/division with plastic is made around each half bed to prevent spread of splashing water
- Gloves are changed per sanitation unit
- Greenhouse lots are rooted separately



BEYOND THE FARM

- *Rooting Station Focus. Consistent Quality Product.*
- **Begonia-specific** rooting stations have disinfected their facilities after cleaning out begonia product.
- **Moving forward at each begonia-specific rooting station:**
 - All personnel sticking cuttings will wear gloves
 - Gloves will be changed after breaks and lunch.
 - Gloves will be disinfected or changed between varieties
 - Where applicable, personnel putting plants down on benches will disinfect hands upon filling each bench, table or bay.
 - **All shearing implements and benches** will be disinfected.
 - **Scouting** will occur on a weekly basis for any concerning signs/symptoms.

Viruses

TMV - Petunia





CMV on Aconitum

Coleus Vein Necrosis Virus (INSV)



Photo M. Daughtrey



Tomato Spotted Wilt Virus (TSWV) on Tomato

(cousin to INSV)

INSV & PM



Photo M. Daughtrey

Tomato – This time INSV



Photo M. Daughtrey



Chlorotic spots

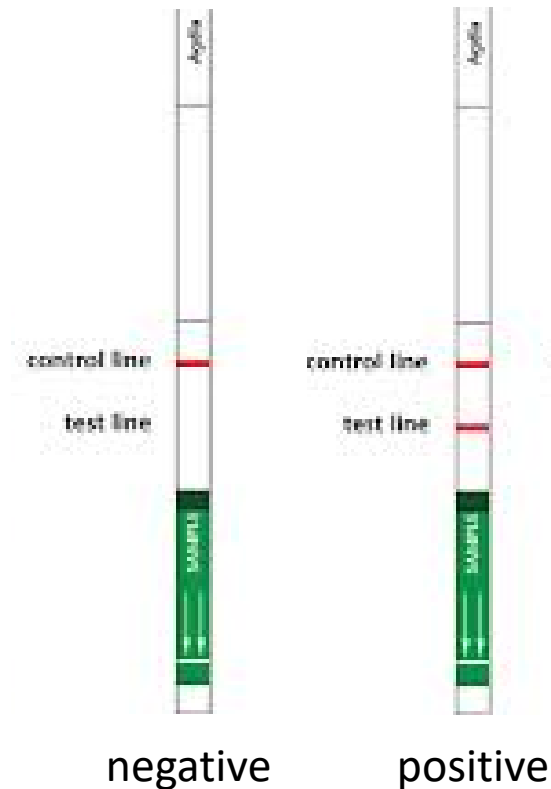
Impatiens Necrotic Spot Virus (INSV) on Pepper transplants



Necrotic spots

Agdia ImmunoStrips

- Very easy to use
- 5 to 20 minutes for the assay
- Can be used in the field
- One immunostrip tests one pathogen
- Limited number of tests for pathogens
- Cost about \$7.00 per test



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