

Welcome To
The Future of Impatiens

PanAmericanSeed®

Downy Mildew Resistant
Beacon™ Impatiens
From PanAmerican Seed

PanAmerican Seed®

PanAmerican Seed's Beacon™ Impatiens exhibit high resistance to the currently known and widely prevalent populations of *Plasmopara obducens*, the cause of Impatiens downy mildew.

Product Definition

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What is Impatiens Downy Mildew (IDM)?

A disease caused by an Impatiens host-specific water mold, *Plasmopara obducens*.



Plasmopara obducens



airborne
sporangia



survival oospores
(soil)

The Disease Cycle of IDM



Under high humidity, aerial sporangia release from structures on the underside of the leaf and can be dispersed long distances by wind or short distances by splashing water.

Cool temperatures (60°F/15°C) and high humidity >85% , especially at night, are ideal for rapid disease development.

Moist air, rainy weather or irrigation practices that extend the amount of time moisture remains on the leaves also encourage the development and expression of downy mildew.

Oospores that form inside infected tissues have the potential to overwinter in the ground and re-infect impatiens sown or replanted into the bed the following year.



airborne
sporangia



survival oospores
(soil)

International Seed Federation (ISF) Definition of Terms

- Susceptibility is the inability of a plant variety to restrict the growth and/or development of a specified pest.
- Resistance references living organisms. Is the ability of a plant variety to restrict the growth and/or development of a specified pest and/or the damage it causes when compared to susceptible plant varieties under similar environmental condition and pest pressure. Two levels of resistance are defined – see next slide.
 - High Resistance
 - Intermediate Resistance
- Immunity is when a plant is not subject to attack or infection by a specified pest.
 - IE: Zinnias are immune to IDM.

Tolerance is not recognized by ISF. This references abiotic stressors such as wind and sun.

Resistance Definitions

Intermediate Resistance

Plant varieties that restrict the growth and/or development of the specified pathogen and/or the damage it causes but *may exhibit a greater range of symptoms or damage compared to high resistant varieties.*

Intermediate resistant plant varieties will show less severe symptoms or damage than susceptible varieties under similar environmental conditions and/or pathogen pressures.

High Resistance

Plant varieties that *highly restrict* the growth and/or development of the specified pathogen and/or the damage it causes *under normal pressure when compared to susceptible varieties under similar environmental conditions and pathogen pressure.*

These plant varieties *may, however, exhibit some symptoms or damage under heavy disease pressure.*

What Does High Resistance to IDM Look Like?



Super Elfin® XP Violet (Top)
Vs
Beacon™ Exp. Violet Shades



Beacon™ Exp. Orange (Top)
Vs
Super Elfin® Brt. Orange

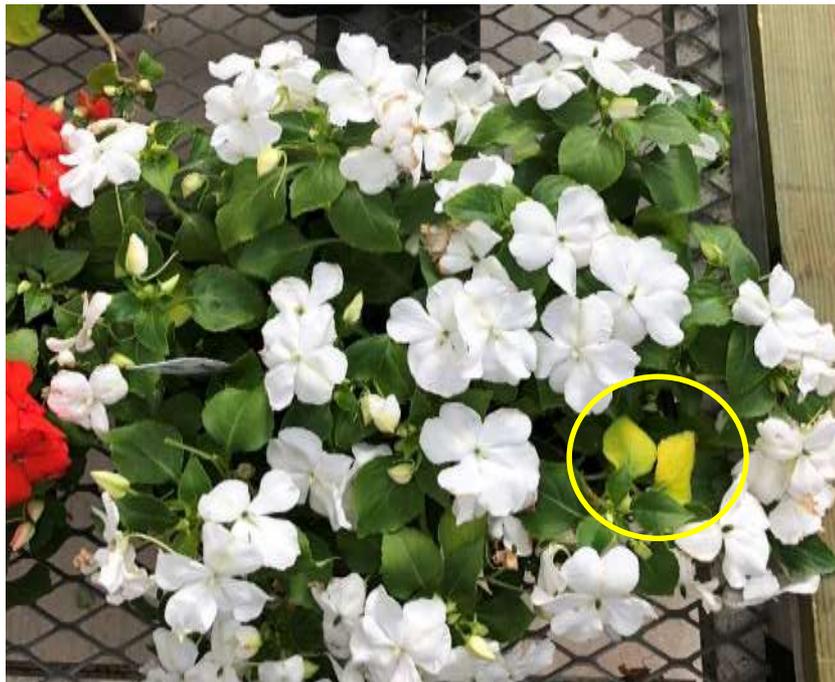
High Resistance is not Immunity – What does this mean?

Per the definition of High Resistance:

- Plant varieties *may exhibit some symptoms or damage* under heavy disease pressure.

This means:

- Possible to see some leaf discoloration, there may be some limited sporulation under high disease pressure.
- Plants may abscise the affected leaves, but the plant will continue to live and thrive.



Beacon™ Exp. White

High Resistance is not Immunity – What does this mean?



- Possible to see some leaf discoloration; there may be some limited sporulation under high disease pressure.
- Plants may abscise the infected leaves, but the plant will continue to live and thrive.

Impatiens Downy Mildew Disease Resistance Screening

Inoculation of plants:

Young plants are challenged with aerial inoculation of *Plasmopara obducens* sporangia under high disease pressure in environmentally controlled conditions.

Resistant screens conducted in Venhuizen, NL and Elburn, IL greenhouses and in the Ball Helix West Chicago, IL laboratory.

All hybrids are screened a minimum of 10 times.

High correlation of results between the greenhouse/lab screen and field.

Example of Young Plant Screen

Sporulation on
Commercial
Variety



From Left to Right: Four Beacon™ Exp. Varieties and 1 Super Elfin® XP Variety.

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Greenhouse Demonstrations

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Resistance Screen: 4 Weeks Post Inoculation

Inoculated

Beacon™ is Thriving



Super Elfin® XP White vs. Beacon™ Exp. White

Venhuizen, NL Week 9, 2018

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Resistance Screen: 4 Weeks after Inoculation

Inoculated

Beacon™ is Thriving



Super Elfin® XP Salmon vs. Beacon™ Exp. Coral

Venhuizen, NL Week 9, 2018

PanAmericanSeed.

Resistance Screen: 4 Weeks after Inoculation

Beacon™ are Thriving

Inoculated



Beacon™

Super Elfin® XP Red
Vs
Beacon™ Exp. Red



Beacon™

Super Elfin® Brt. Orange
Vs
Beacon™ Exp. Orange

Venhuizen, NL Week 9, 2018

PanAmericanSeed.

Resistance Screen:

Inoculated

1 Week After Inoculation Visible IDM Symptoms on Susceptible Variety



Super Elfin® XP
White



Beacon™ Exp. White

Elburn, IL Week 26, 2018

PanAmericanSeed.

Resistance Screen: 5 Weeks Later Beacon™ is Thriving

Inoculated



Resistance Screen:

Inoculated

1 Week After Inoculation Visible IDM Symptoms on Susceptible Variety



Super Elfin® XP
Violet



Elburn, IL Week 26, 2018



Beacon™ Exp. Violet
Shades

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Resistance Screen:

Inoculated

5 Weeks Later Beacon™ is Thriving



Resistance Screen:

Inoculated

5 Weeks Later Beacon™ are Thriving



Beacon™ Exp. Bright Red



Beacon™ Exp. Coral

Elburn, IL Week 31, 2018

PanAmericanSeed.

Resistance Screen:

Inoculated

5 Weeks Later Beacon™ are Thriving



Beacon™ Exp. Orange



Beacon™ Exp. Salmon

Elburn, IL Week 31, 2018

PanAmericanSeed.

Resistance Screen: Beacon™ are Thriving

Inoculated



Trial Overview: Beacon™ Exp. Varieties and Susceptible Commercial Varieties including SE XP and Xtreme (circled).

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Beacon™ Impatiens
Phenotype Demonstration

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Beacon™ Downy Mildew Resistant Varieties

Elburn, IL Week 32, 2018. 3 plants per basket.



White



Red



Violet
Shades



Beacon™ Downy Mildew Resistant Varieties

Elburn, IL Week 32, 2018. 3 plants per basket.



Orange



Coral



Salmon



F

Field Demonstrations

Natural Infection

PanAmerican Seed®

Sporulation Video

Super Elfin® XP
Scarlet
Week 35, 2018
Venhuizen, NL



11 Weeks After Transplant, Beacon™ Exp. is Thriving



Super Elfin® XP White



Beacon™ Exp. White

11 Weeks After Transplant, Beacon™ is Thriving



Beacon™ Exp. Coral vs. Super Elfin® XP Salmon

Container Trials:

Natural Infection

9 Weeks After Transplant, Beacon™ are Thriving

Beacon™ Exp. Varieties



Super Elfin® Varieties

Venhuizen, NL Week 35, 2018

PanAmerican Seed.

9 Weeks After Transplant, Beacon™ are Thriving



Beacon™ Exp. Orange (Top) vs Super Elfin®
Brt. Orange



Beacon™ Exp. Violet Shades (Top) vs Super
Elfin® XP Violet

Field Trials: 7 Weeks after Transplant Beacon™ is Thriving, Super Elfin® XP is Showing First DM Symptoms

Natural Infection

Elburn, IL Week 30, 2018



Super Elfin® XP White



Beacon™ Exp. White



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Field Trial: 2 Weeks Later, Beacon™ is Thriving

Natural Infection

Elburn, IL Week 32, 2018



Super Elfin® XP White



Beacon™ Exp White



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Field Trials: 7 Weeks after Transplant Beacon™ is Thriving, Super Elfin® XP is Showing First DM Symptoms

Natural Infection

Elburn, IL Week 30, 2018



Super Elfin® XP Violet



Beacon™ Exp Violet Shades



PanAmericanSeed.

Field Trial: 2 Weeks Later, Beacon™ is Thriving

Natural Infection

Elburn, IL Week 32, 2018



Super Elfin® XP Violet

Beacon™ Exp Violet Shades

Beacon™ Production Information

Follow Super Elfin Production Protocols:

- Germination conditions

- Plug timing

- Moisture, fertilization and PGR requirements

Good News!

Flower timing and bloom window is very similar to the market leading series, Super Elfin.

Details on next slide.

Beacon™ Production Timing Details

Average Times to 1st Flower and to 50% Flower (Retail Ready):
Comparable to like colors in SE series.

Flower Timing Window: 5-7 Days

Flower Timing from Earliest:

White 771

Salmon

Red

Coral

Violet Shades

Orange

Beacon™: IDM Preventative Fungicide Treatment

Discuss and demonstrate what high resistance is and means.

Talk through the grower production practices and assess risks:

What is their (or their customers) acceptance of possible few yellow leaves?

Are susceptible genetics in production?

Seasonal and Regional implications.

Are plugs or plants being produced where impatiens are currently growing in the landscape and shipping to other regions?

Do they receive plugs or plants from a region where impatiens are currently growing in the landscape?

Trial.

Questions?

Comments?

PanAmericanSeed®

**For More Information about Beacon™ Impatiens:
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