Intrinsic®
Brand Fungicides

Orkestra™ Intrinsic Brand Fungicide

U.S. Technical Information Brochure

BASF
We create chemistry

contents

Introduction

Orkestra™ Intrinsic® brand fungicide provides nursery and greenhouse growers with fast, long-acting disease control during production, resulting in healthier, more consistent, high quality plants. **Orkestra Intrinsic** brand fungicide contains a new BASF active ingredient, **Xemium®**. In combination with a second active ingredient, **Orkestra Intrinsic** brand fungicide provides highly effective control of foliar and soil-borne diseases, and delivers plant health benefits. These potent active ingredients are members of two different classes of chemistry: carboxamide and strobilurin.

above:
Orkestra Intrinsic *brand fungicide protects Hydrangea from Botrytis blight.*

With its dual modes of action, **Orkestra Intrinsic** brand fungicide expands the spectrum of disease control in herbaceous and woody ornamentals in nurseries and greenhouses. The two modes of action also make it a valuable rotation partner for fungicide resistance management in ornamental production.

Orkestra Intrinsic brand fungicide provides preventive, early curative, and residual protection against key ornamental diseases, quickly stopping the growth of fungal cells. This premix fungicide also delivers plant health benefits, including greater photosynthetic efficiency and stronger roots that promote resilience to stressors like drought and extreme temperatures in the production process.

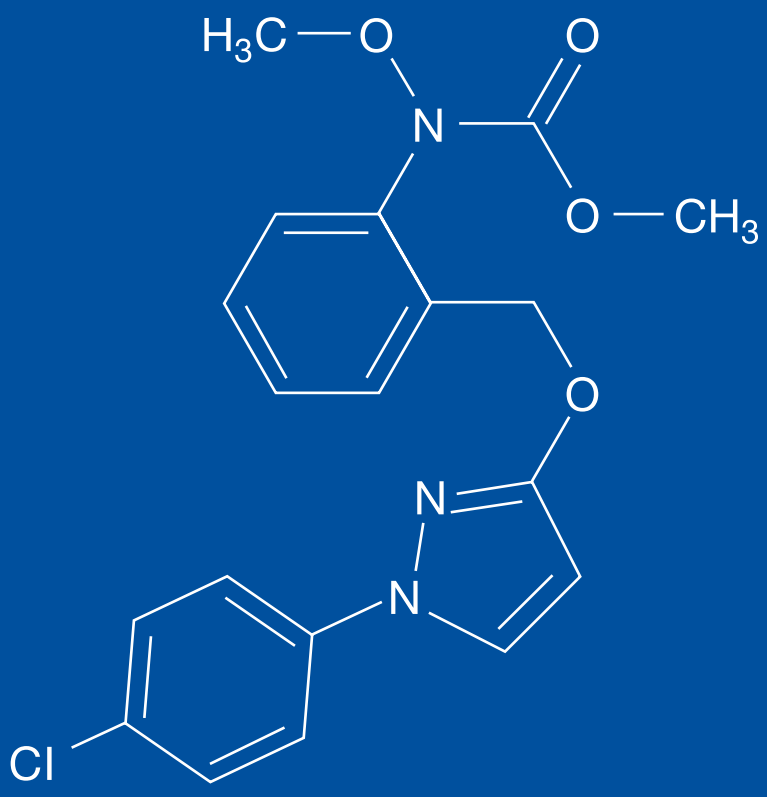
Research trials have demonstrated that **Orkestra Intrinsic** brand fungicide provides excellent disease prevention, control, and residual activity.

Key Features and Benefits:

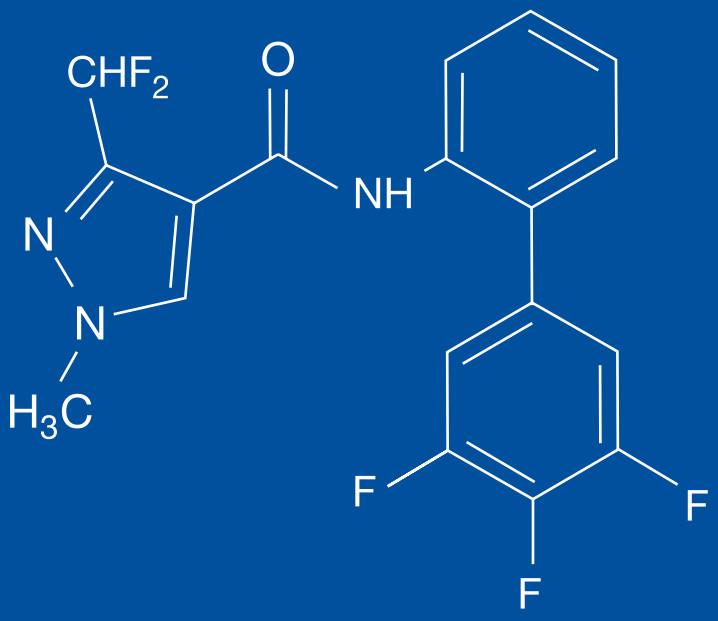
- Controls 48 genera of plant pathogens that cause disease in production ornamentals
- Formulated for translaminar stability to stay where diseases occur
- Includes the active ingredient pyraclostrobin for enhanced plant health
- Delivers dual modes of action for better efficacy and resistance management
- Rainfast: important in nursery and greenhouse applications where irrigation and rainfall are frequent

physical and chemical properties

BSI Common Name	Pyraclostrobin
Chemical Family	Strobilurin
CAS Number	175013-18-0
Chemical Name (IUPAC)	methyl N-[2-[[1-(4-chlorophenyl)pyrazol-3-yl]oxymethyl]phenyl] -N-methoxycarbamate
Chemical Name (CA)	2-methoxyethyl a-cyano-a-[4-1,1-dimenthylethyl)phenyl]- ß-oxo2-(trifluoromethyl) benzene propanoate
Empirical Formula	$C_{19}H_{18}ClN_3O_4$
Molecular Mass	387.82 g/mol
Appearance	White or light beige crystalline solid
Odor	Odorless
Melting Point	63.7° - 65.2°C
Density	1.285 g/cm^3
Octanol/water partition coefficient (log)	at 22°C: 3.99
Vapor Pressure	at 20°C: 1.95 x 10^{-10} x 10^{-6} mm Hg
Solubility in Water	at 20°C: 1.9 mg/L
pH	6.4 at 25°C



BSI Common Name	Fluxapyroxad
Chemical Family	Carboxamide
CAS Number	907204-31-3
Chemical Name (IUPAC)	3-(difluoromethyl)-1-methyl-*N*-(3', 4', 5'-trifluorobiphenyl-2-yl) pyrazole-4-carboxamide
Chemical Name (CA)	3-(difluoromethyl)-1-methyl-N-(3', 4', 5'-trifluoro[1, 1'-biphenyl]-2-yl)-1*H*-pyrazole-4-carboxamide
Empirical Formula	$C_{18}H_{12}F_5N_3O$
Molecular Mass	381.31 g/mol
Appearance	Off-white, pink tint
Odor	Faint odor, fruity
Melting Point	156.8°C
Density	1.47 g/cm^3
Octanol/water partition coefficient (log)	at 20°C: 3.08
Vapor Pressure	at 25°C: 8.1 x 10^{-9} Pa
Solubility in Water	at 20°C: 3.88 mg/L at pH 5.8
pH	5.8 of 1% solution in water



top to bottom:

Fusarium leaf spot of Aucuba, Phytophthora stem and crown rot of African Violet, Juniper Phomopsis twig blight, and black spot of Rose

Biological Profile

Mode of Action

Orkestra™ Intrinsic® brand fungicide contains two classes of chemistry assigned by the Fungicide Resistance Action Committee (FRAC). Pyraclostrobin is a quinone outside inhibitor (QoI) and a Group 11 fungicide. **Xemium®** is a succinate-dehydrogenase inhibitor (SDHI) and a Group 7 fungicide.

Pyraclostrobin works by inhibiting quinone, which is located in Complex III of the intermembrane space of the mitochondria. When inhibited, the fungus can no longer perform mitochondrial respiration and produce ATP. This starves the pathogen of energy and kills the fungus. Pyraclostrobin is translaminar and locally systemic; it does not translocate in the plant via xylem or phloem.

Xemium® works by inhibiting succinate-dehydrogenase in fungi's Complex II. Inhibition of this important enzyme in the mitochondrial respiratory chain rapidly reduces ATP in cells, resulting in fungal cell starvation and death. The active ingredient is transported acropetally from the point of application: it travels with water through the xylem, up and out to the leaf tips, providing systemic protection from fungal pathogens.

The combination of these two active ingredients and their dual modes of action imparts **Orkestra Intrinsic** brand fungicide's fungal selectivity and broad-spectrum activity.

Diseases Controlled by Orkestra™ Intrinsic® Brand Fungicide

The following table lists foliar, crown, and soilborne diseases controlled by **Orkestra Intrinsic** brand fungicide.

Disease	Pathogen
Anthracnose	*Colletotrichum* spp.
Crown and basal rot	*Cylindrocladium* spp., *Fusarium* spp., *Rhizoctonia solani, Sclerotinia* spp.
Downy mildew	*Peronospora* spp., Pseudoperonospora spp., *Plasmopara* spp.
Flower and petal blight	*Botrytis* spp., *Coniothyrium* spp., *Exobasidium* spp., *Monilinia* spp., *Ovulina* spp.
Leaf spot	*Alternaria* spp., *Blumeriella* spp., *Cercospora* spp., *Diplocarpon rosae, Entomosporium* spp., *Helminthosporium* spp., *Mycosphaerella* spp., *Myrothecium* spp., *Phyllosticta* spp., *Sphaceloma* spp., *Wilsonomyces* spp.
Phytophthora aerial blight	*Phytophthora spp.*
Powdery mildew	*Erysiphe* spp., *Oidium* sp., *Podosphaera* sp., *Sphaerotheca* sp., *Uncinula* sp.
Rot, blight	*Botryosphaeria* spp., *Botrytis* spp., *Coniothyrium* spp., *Exobasidium* spp.
Rust	*Albugo spp., Coleosporium* spp., *Gymnosporangium* spp., *Puccinia* spp., *Uromyces* spp.
Scab	*Venturia* spp., *Cladosporium* spp.
Stem or twig blights and dieback	*Botrytis* spp., *Botryosphaeria* spp., *Cylindrocladium* spp., *Gloeosporium* spp., *Monilinia* spp., *Nectria* spp., *Phoma spp., Phomopsis* spp., *Sclerotium rolfsii, Volutella* spp.
Soilborne disease	*Cylindrocladium spp., Fusarium* spp., *Rhizoctonia solani, Sclerotinia* spp., *Sclerotium rolfsii, Thielaviopsis* spp.*, *Phytophthora* spp., *Pythium* spp.

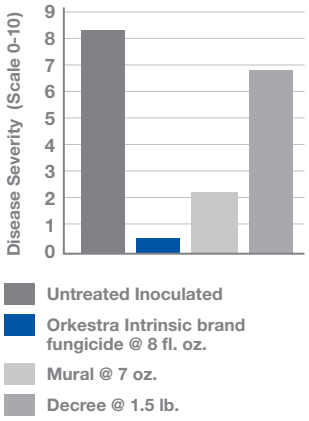
** Suppression.*

top to bottom:
Dahlia powdery mildew, Gardenia leaf spot caused by Phyllosticta, and Botrytis blight of Hydrangea

Research Trial Results

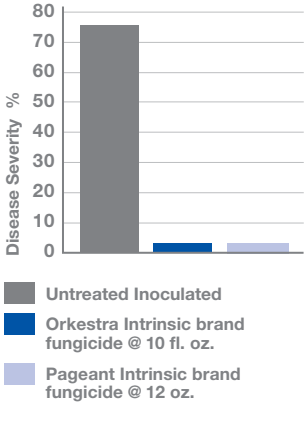
Trial results show that **Orkestra™ Intrinsic®** brand fungicide is an effective disease control solution on a broad range of diseases and imparts plant health benefits to growing plants. These attributes combine to make **Orkestra Intrinsic** brand fungicide a valuable tool for maintaining healthy plants during production.

Gray Mold Control of Tulip *(Botrytis eliptica)*



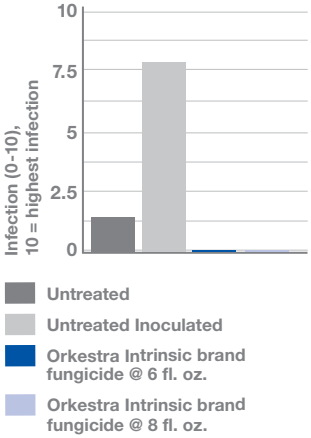
N. Catlin, Cornell University, 2015 IR-4 sponsored trial. (1)

Control of Japanese Ligustrum Cercospora *(Cercospora* spp.*)*



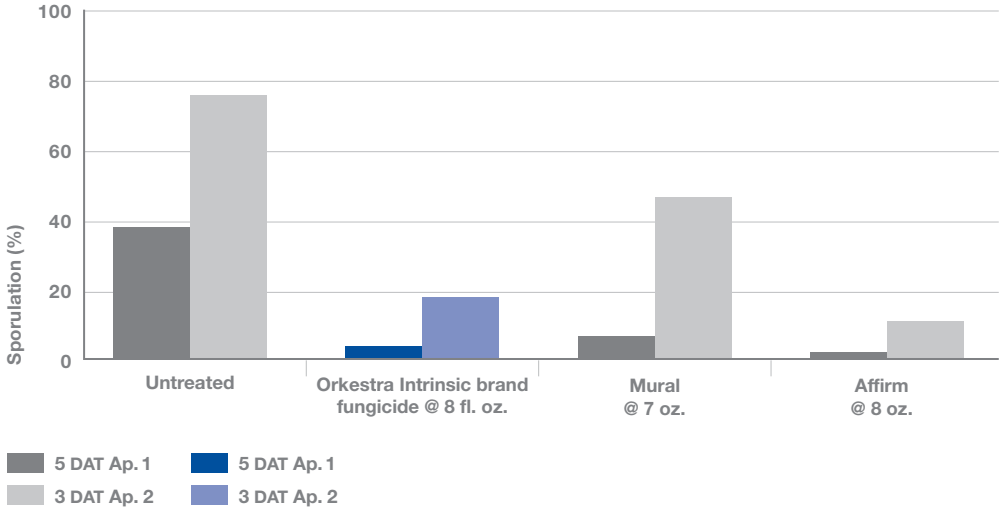
A. Palmateer, University of Florida, 2014. BASF-sponsored trial. (2)

Control of *Puccinia* spp. on Snapdragon



Dr. G. Chastagner, Wash State Univ., 2015. Application: 10-5, 10-19, 11-4, 11-19. BASF-sponsored trial. (3)

Gray Mold (Botrytis cinerea) Sporulation Controlled in Geranium

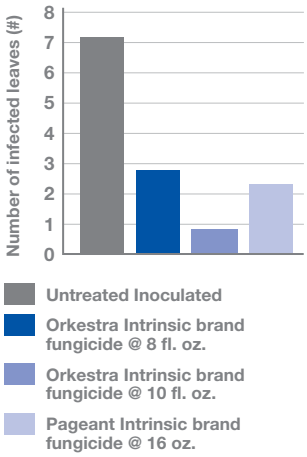


M. Hausbeck, Michigan State University, 2015. IR-4 sponsored trial. (4)

Research footnotes:

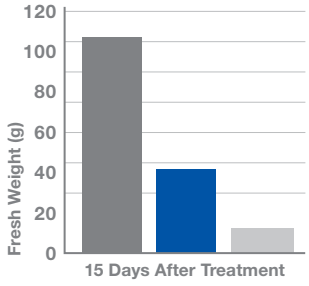
1. ***Orkestra™ Intrinsic®** brand fungicide and Mural fungicide treatments statistically similar and different from Decree and Untreated Inoculated.*
2. ***Orkestra Intrinsic** brand fungicide and **Pageant Intrinsic** brand fungicide statistically similar and different from Untreated Inoculated.*
3. ***Orkestra Intrinsic** brand fungicide statistically different from Untreated Inoculated. Partial treatments shown.*
4. *Partial data is shown. **Orkestra Intrinsic** brand fungicide is statistically different from Mural and Untreated Inoculated after two applications. **Orkestra Intrinsic** brand fungicide is statistically similar to Affirm; however, for **Orkestra Intrinsic** brand fungicide after 2nd Application and for Affirm following 3rd Application.*

Control of Fusarium Aerial Blight *(Fusarium* spp.*)* of Hosta 'Areomarginata'



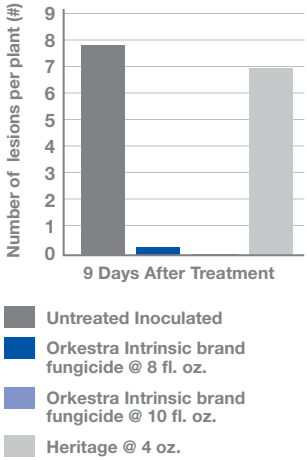
J. Buck, University of Georgia, 2014. BASF-sponsored trial. (5)

Florist Geranium Fresh Weight Reflects Control of Sclerotinia *(Sclerotinia sclerotiorum)*



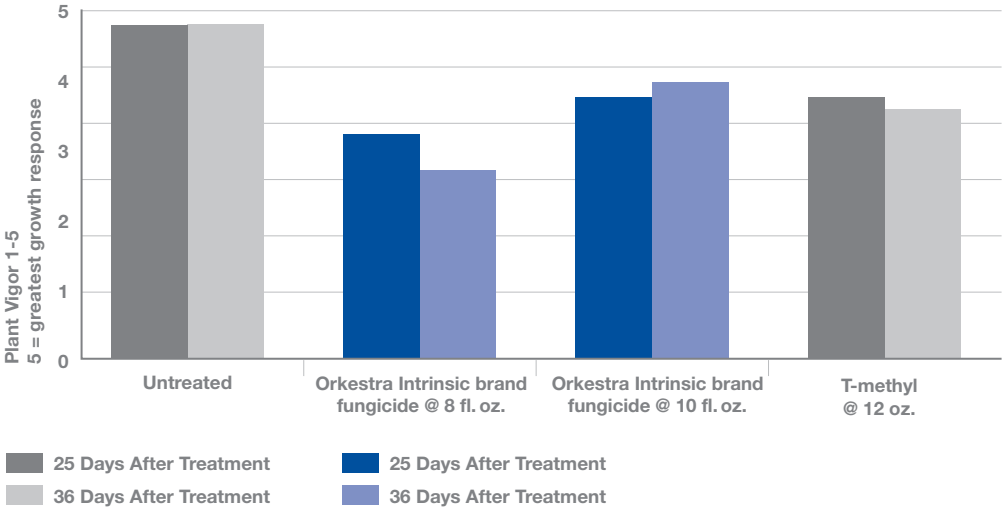
S. Wegulo, University of Nebraska, 2014. BASF-sponsored trial. (6)

Control of Myrothecium Leaf Spot *(Myrothecium roridum)* on Dieffenbachia



D. Norman, University of Florida, 2014. BASF-sponsored trial. (7)

Resilience to *Thielaviopsis* spp. Observed with Orkestra Intrinsic Brand Fungicide After Treatment on Viola



J. Beckerman, Purdue University, 2015. BASF-sponsored trial. (8)

Research footnotes:

5. ***Orkestra™ Intrinsic®*** *brand fungicide and* ***Pageant Intrinsic*** *brand fungicide is statistically similar and different from Untreated Inoculated.*
6. ***Orkestra Intrinsic*** *brand fungicide is statistically different from T-Storm and Untreated Inoculated.*
7. ***Orkestra Intrinsic*** *brand fungicide is statistically different from Heritage and Untreated Inoculated.*
8. ***Orkestra Intrinsic*** *brand fungicide is statistically similar to T-methyl and Untreated.*

Formulation and Use

Orkestra™ Intrinsic® brand fungicide has been approved for foliar and soil application on production ornamentals, including annuals, foliage plants, herbaceous perennial and woody shrubs and trees. **Orkestra Intrinsic** brand fungicide is formulated as a suspension concentrate (2.09 lbs a.i./gallon each of pyraclostrobin and **Xemium®**). Research shows **Orkestra Instrinsic** brand fungicide controls the major diseases that occur on nursery plants and greenhouse crops at use rates of 4 to 11 fl oz/100 gallons. Following extensive plant tolerance testing, few plant concerns have been observed other than applications to ninebark, wintercreeper and open blooms on impatiens and petunia (see label for specific instructions).

Application Timing of BASF Fungicides

YOUNG PLANTS

Pageant®
Intrinsic® Brand Fungicide

Spray on unrooted cuttings, seedlings

Empress®
Intrinsic® Brand Fungicide

Drench on rooted plugs, seedlings, cuttings

TRANSPLANTS

Empress®
Intrinsic® Brand Fungicide

Drench to prevent major root diseases

GROWTH TO FINISH

Orkestra®
Intrinsic® Brand Fungicide

Empress®
Intrinsic® Brand Fungicide

Drench to prevent major root diseases through growth to maturity

Stature® SC
Fungicide

In rotation as the first choice for treatment of downy mildew diseases

Orvego®
Fungicide

In rotation to prevent major root diseases of Phytophthora spp.

Trinity®
Fungicide

In rotation to prevent stem, crown and root rots and diseases

MARKET READY

Pageant®
Intrinsic® Brand Fungicide

Spray for protection against foliar, stem and crown diseases through handling, shipping and in market

Disease Control and Residual Activity

Orkestra™ Intrinsic® brand fungicide provides control of targeted diseases when applied preventively or as an early curative when plants are being grown to finish.

Orkestra Intrinsic brand fungicide typically controls foliar, stem, and crown diseases for up to 14 days under moderate infection. Soilborne diseases controlled with drench applications are managed on 7-28 day intervals, depending on disease pressure and environmental conditions.

Orkestra Intrinsic brand fungicide is rainfast once it has dried following application.

Resistance Management

Orkestra Intrinsic brand fungicide demonstrates high efficacy against many diseases; like all fungicides, it will work best in an IPM program.

Rotate with other fungicides with different modes of action to avoid developing resistance in susceptible pathogens. BASF recommends the following:

- Rotate fungicides with different modes of action; ensure that no mode of action is used more than twice in sequence.
- Always follow local IPM recommendations and the recommended thresholds for each disease.
- Apply the recommended label application rate at the proper timing to ensure complete control of the disease species.
- Use proper application methods to maximize product activity; applications at less than the recommended label rate will allow disease pressure to build, increasing the disease pressure and potentially triggering resistance problems in the future.

Safety Measures

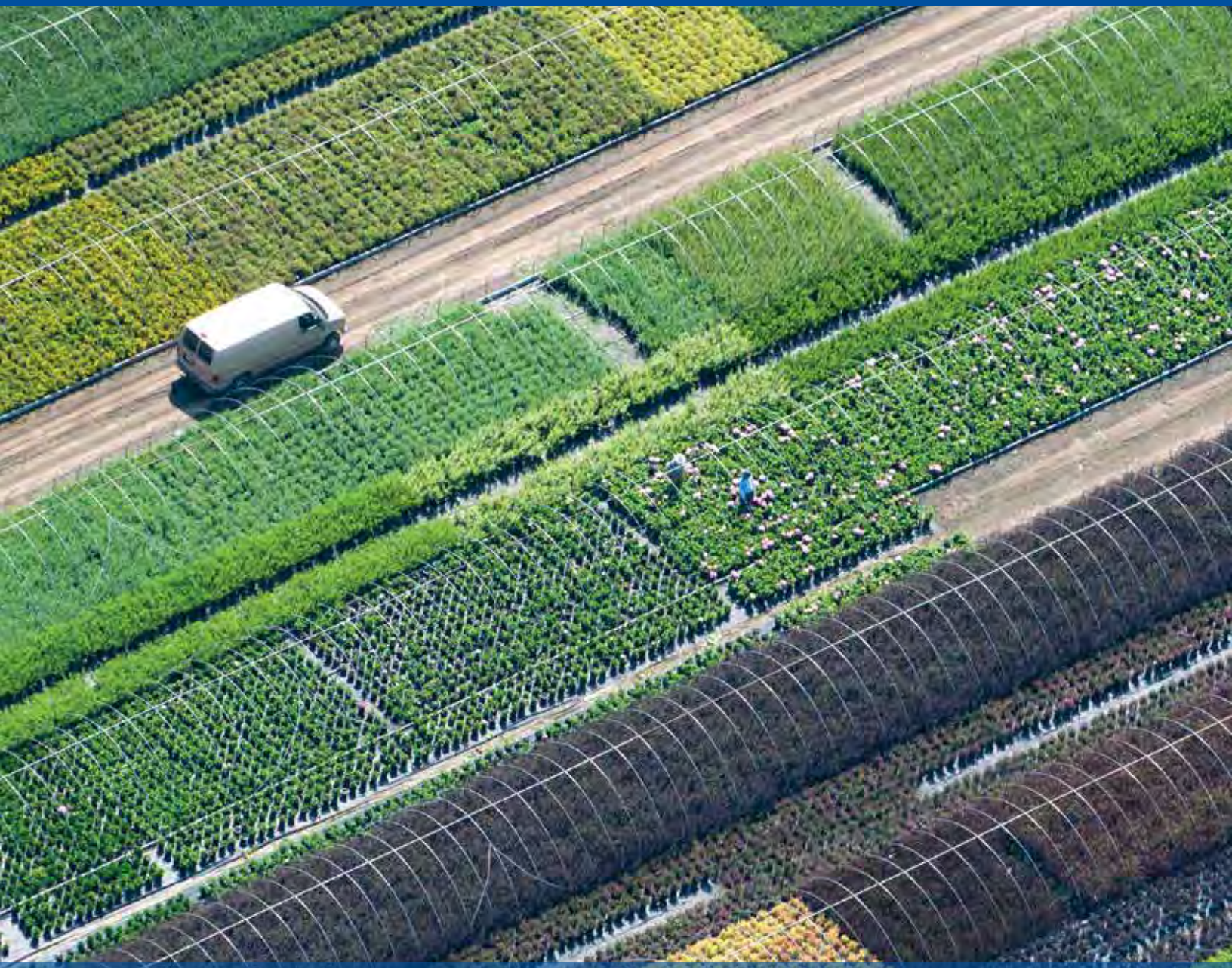
Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical resistant gloves (such as natural rubber, nitrile, butyl, neoprene and/or barrier laminate)
- Shoes plus socks

Poison Information Center at BASF

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).



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Always read and follow label directions.