



Thiamethoxam: CGA293'343

Meridian™ 25 WG insecticide is now registered for the control of many problem insect pests in turf and landscape plantings. Meridian is based on the active ingredient thiamethoxam, and will also be formulated as a 0.33% granule. These formulations have an excellent shelf life and allow for a flexible rate range based on the application placement, timing, and target species.

**● Activity**

Meridian is based on a unique thianicotinyl insecticide that exhibits broad-spectrum activity. Meridian works through ingestion and contact activity by affecting the nicotinic acetylcholine receptors within the insect. The active ingredient, thiamethoxam, moves into the soil profile where it binds to soil particles, is available for uptake by plant roots, and is biologically active against soil pests. Meridian is upwardly mobile in the plant, so when applied to the soil, it will move into stems and foliage to protect above-ground plant parts. Meridian is effective as a foliar spray applied to landscape plants. With rapid uptake, knockdown activity, and appropriate half-life, Meridian provides excellent preventive and curative control of soil and foliage pests of turf and landscape plants.

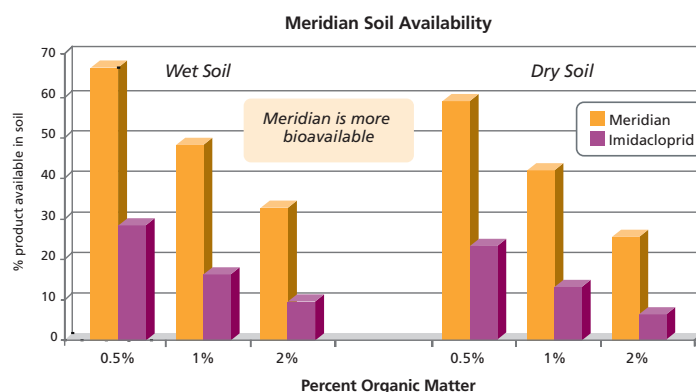
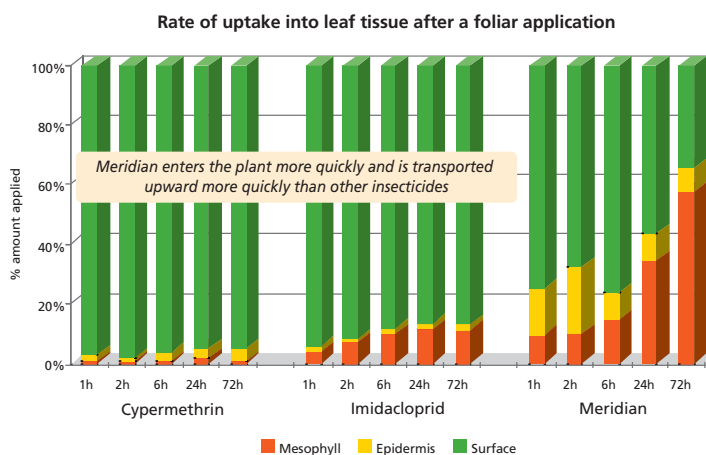
**Foliar applications**

Meridian may be applied to the foliage of landscape plants. On the leaf surface, thiamethoxam is quickly absorbed into the leaf (15% while drying; 23% at 28 hours after application). With this fast uptake into the foliage, Meridian is rain-fast upon drying, and rain and irrigation will not affect initial control of the target pests. Meridian continues to be absorbed over the next several days, forming a reservoir of thiamethoxam in the leaf that provides residual control of many piercing-sucking, and leaf chewing insects. Surface residues will provide contact activity for 24 to 48 hours before breaking down and becoming safe to beneficial insects.

**Soil applications**

When applied to the soil, Meridian provides control of pests in the soil and in upper parts of the plant at the same time. Meridian exhibits excellent systemic uptake and xylem translocation throughout the plant. Meridian moves in an upward acropetal direction, accumulating in plant tissues to form a reservoir of thiamethoxam that protects the foliage against many piercing-sucking and chewing insects. It is slowly metabolized within leaves, resulting in extended residual control. Meridian exhibits extended bioavailability since it is not irreversibly bound in soil due to its unique chemical characteristics. It is available for uptake by plants over an extended period of time and under a variety of soil types and conditions.

Meridian will effectively control soil insects in the soil profile, especially white grubs, in addition to being systemically active in plants. Meridian provides flexibility in application timing and season long control of soil dwelling insects, coupled with its long half-life, its bioavailability as it ages in soil, and its curative and preventive control.



Loam soil. Meridian  $K_{oc} = 58$ , Imidacloprid  $K_{oc} = 262$ .

Syngenta internal trials; averaged across 1997-99 trials.

## ● Product performance

Broad-spectrum insect control—pest evaluations to date:

### Soil pests

- White grubs:
  - Asiatic garden beetle
  - Chafer: European, Southern Masked, Northern Masked
  - Japanese beetle
  - Oriental beetle
  - Green June beetle
  - Black turfgrass ataenius
  - *Aphodius* spp.
- Billbugs
- Sod webworms
- Fire ants (mound treatment)
- Ants
- Mole crickets suppression
- Chinch bugs suppression

### Foliar pests

- Azalea lacebug
- Leaf miners
- Aphids
- Whiteflies
- Mealybugs
- Plant bugs
- Leafhoppers
- Tent caterpillars
- Leaf beetles
- Soft scales
- Sawflies
- Adelgid
- Flea beetles
- Honeylocust pod gall, Blister gall, Nipple gall

### Meridian use rates

Pests	25WG	0.33 G
White Grubs	12.7–17 oz/A	60–80 lbs/A
Suppression of Mole Crickets and Chinch Bugs	12.7–17 oz/A	60–80 lbs/A
Fire Ants	1–3 oz/10 gals	N/A
Landscape Plants	2–8.5 oz/100 gals OR 6–17 oz/A	27–80 lbs/A

## ● Window of application

White grubs can be an annual problem, requiring treatments to be made before grubs are present. A preventive application of Meridian is effective if it is made within the 45 days of adult flight for the targeted species (based on history for the site). In some situations, grubs may be present at the time of application. Meridian is highly effective as a curative treatment of 1st and 2nd instars. Meridian provides flexibility in application timing (about 3.5 months) because it is effective as both preventive treatment and curative treatment. For example, for Japanese beetle, this application window can historically be from about May 15th to August 15th, depending on the region.



White Grubs



Asiatic Garden Beetle



Billbug



Black Turfgrass Ataenius



European Chafer



Green June Beetle



Japanese Beetle



Mole Cricket



Oriental Beetle



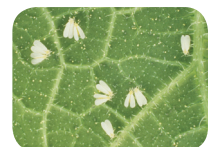
Fire Ants



Chinch Bug



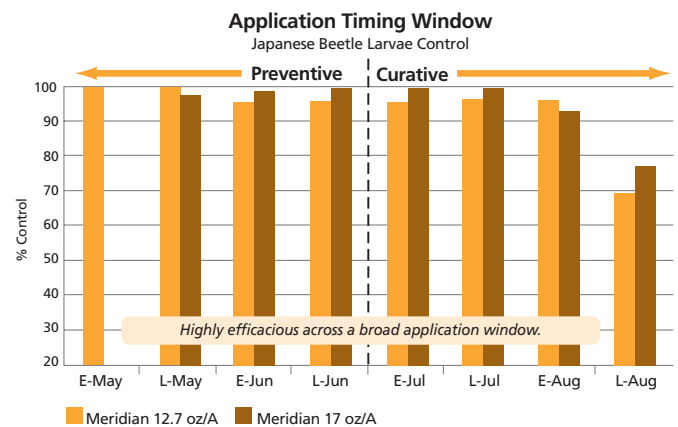
Aphids



Whiteflies



Mealybugs



### ● Effect of delayed irrigation or rainfall

Meridian allows for flexibility for the timing of watering-in. Irrigation or rainfall can be one full week after application without affecting control. The amount of rain or irrigation has minimal influence on preventive control.

### ● Environmental fate

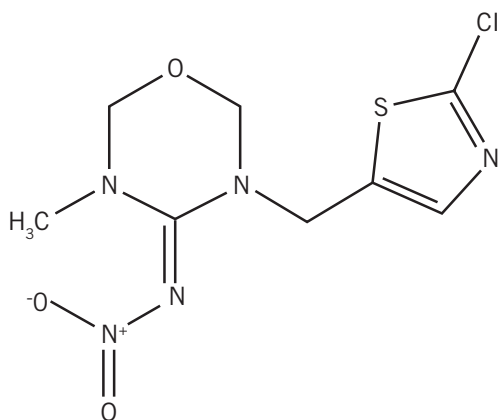
Thiamethoxam is quickly degraded in laboratory studies, exhibiting a half-life of 25–32 days. This initial rapid degradation is attributed to the available material in the dissolved phase of the soil. Once thiamethoxam is bound to soil (a few days), the degradation becomes limited by the desorption kinetics, with a desorption half-life ranging from 69 to 132 days. Once thiamethoxam is bound to soil, it exhibits lower mobility and lower potential to leach.

### ● Plant tolerance

Excellent plant tolerance has been determined for Meridian 25WG or 0.33G. Plant tolerance of 1–4X has been determined at label rates on landscape plants and turf. Because not all plants, environmental conditions, and tank mix combinations can be tested, Meridian should be tested for phytotoxicity on a limited area of landscape, interiorscape, or turf before treating the entire area.

### ● Chemical and physical properties

Chemical structure:



Code Number:	CGA293'343
Chemical Name:	4 <i>H</i> -1,3,5-Oxadiazin-4-imine, 3-[(2-chloro-5-thiazolyl)-methyl]tetrahydro-5-methyl- <i>N</i> -nitro
Empirical Formula:	C <sub>8</sub> H <sub>10</sub> ClN <sub>5</sub> O <sub>3</sub> S
Chemical Class:	Neonicotinoid
Subclass:	Thianicotinyl
Proposed Common Name:	Thiamethoxam
CAS No.:	153719-23-4
Molecular Weight:	291.72
Physical State at 20°C:	Crystalline Powder
Melting Point:	139.1°C
Water Solubility 25°C:	4,100 mg/l
Vapor Pressure 25°C:	6.6 x 10 <sup>-9</sup> Pa
Partition Coefficient 25°C (log P <sub>ow</sub> ):	-0.13
Hydrolysis (t <sub>1/2</sub> at 25°C):	
pH5	Stable
pH7	572–643 days
pH9	4–8 days
Photolysis (t <sub>1/2</sub> ):	
in water	2–3 days
in soil	47–54 days
Soil degradation (t <sub>1/2</sub> ):	
Sandy loam 25°C	25–32 days (dissolved phase) 69–132 days (desorption phase)



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