



syngenta®

Technical Bulletin





Platinum® insecticide from Syngenta Crop Protection offers proven crop protection and more. For potato, vegetable, citrus growers and more, Platinum means higher yield potential and better crop quality. And in the United States alone, more than 250 crop protection and seed treatment sales representatives, plus an extensive technical support team, back Platinum. They bring the worldwide resources of Syngenta to each grower and farm to deliver performance, value and peace of mind.

Syngenta supports Platinum through the company's commitment to stewardship, risk containment technology and industry support. Syngenta is directly involved in more than 50 industry task forces, work groups and committees.

The company continually works to improve its products, offering more powerful active ingredients, more effective formulations, broader labels and more options in pack sizes. Syngenta invests about \$1 billion per year in research and development and employs more than 5,000 people at R&D centers and field stations around the world to develop new solutions for growers.

Through its long-term commitment to its crop protection technology, Syngenta is committed to the long-term success of its customers.

What is Platinum?

Platinum insecticide is a broad-spectrum, soil-applied insecticide with a systemic mode of action. It is a Group 4A neonicotinoid insecticide containing the active ingredient thiamethoxam. Plant roots quickly absorb Platinum and the active ingredient rapidly transports throughout the plant. This movement results in part from thiamethoxam's high water solubility, moderate soil adsorption and low partition coefficient. These chemical properties give Platinum long residual activity and consistent pest control. Thiamethoxam controls target pests by interfering with the nicotinic acetylcholine receptors in their nervous systems. After insects contact the insecticide, feeding stops within a few hours and death generally occurs within 24 to 48 hours.

Because of its high mobility within the plant and outstanding efficacy, Platinum exhibits excellent systemic activity against sucking and chewing pests in berries, brassica vegetables, citrus fruit, cucurbit vegetables, fruiting vegetables, grapes, leafy vegetables and potatoes.

THE PLATINUM ADVANTAGE

- Controls more than 30 sucking and chewing pests
- Rapid root uptake
- Highly systemic within plants
- Long-lasting residual control
- Low use rates
- Compatible with Integrated Pest Management (IPM) programs
- Compatible with other crop protection products
- Strong mammalian and environmental safety profile
- Well tolerated by crops

Registered Crops

Platinum is labeled for use on the following crops:

- **Brassica Vegetables** (bok choy, broccoli, broccoli raab, Brussels sprouts, cabbage, cauliflower, cavalo broccoli, Chinese broccoli, Chinese cabbage [napa], Chinese mustard cabbage, collards, kale, kohlrabi, mizuna, mustard greens, mustard spinach and rape greens)
- **Bushberries** (blueberry [high and low bush], currant, elderberry, gooseberry, huckleberry, juneberry, lingonberry and salal)
- **Citrus Fruit** (calamondin, citrus citron, citrus hybrids [chironja, tangelo and tangor], grapefruit, kumquat, lemon, lime, mandarin [satsuma, tangerine], orange [sour, sweet], pummelo)
- **Cucurbit Vegetables** (chayote, Chinese waxgourd, citron melon, cucumber, edible gourd, gherkin, *Momordica* spp., muskmelon, pumpkin, squash [summer and winter] and watermelon)
- **Fruiting Vegetables** (eggplant, groundcherry, pepino, peppers [bell, chili, cooking, pimento and sweet], tomatillo and tomato)
- **Grapes**
- **Hops**
- **Leafy Vegetables** (amaranth, arugula, cardoon, celery, celtuce, Chinese celery, chrysanthemum [edible-leaved and garland], corn salad, cress [garden and upland], dandelion, dock, endive, fennel, lettuce [head and leaf], orach, parsley, purslane [garden and winter], radicchio, rhubarb, spinach [including New Zealand and vine] and Swiss chard)
- **Root Vegetables** [except sugarbeets] (carrot, celeriac, chicory, edible burdock, garden beet, ginseng, horseradish, Oriental radish, parsnip, radish, rutabaga, salsify [black salsify and Spanish salsify], skirret, turnip, turnip rooted chervil and turnip rooted parsley)
- **Strawberries**
- **Tobacco**
- **Tuberous and Corm Vegetables** (arracacha, arrowroot, canna, cassava [bitter and sweet], chayote [root], Chinese artichoke, chufa, dasheen, ginger, Jerusalem artichoke, leren, potato, sweet potato, tanier, turmeric, yams and yam bean)

Platinum® 75SG Label at a Glance*

CROP	PESTS	RATE PER APPLICATION	MAXIMUM RATE PER GROWING SEASON	PREHARVEST INTERVAL (PHI) IN DAYS
Brassica Vegetables	Aphids, Flea Beetles, Thrips, Whiteflies	1.66 – 3.67 oz/A	3.67 oz/A	30
Bushberries	Aphids, Grub Complex, Japanese Beetle, Leafhoppers	1.66 – 4.01 oz/A	4.01 oz/A	75
Citrus Fruit	Aphids, Armored Scales, Citrus Blackfly, Diaprepes Root Weevil (larvae and adults), Leafhoppers, Mealybugs, Root Weevils, Sharpshooters, Soft Scales, Thrips, Whiteflies	2.67 – 3.67 oz/A	3.67 oz/A	0
	Asian Citrus Psyllid, Citrus Leafminer	1.83 – 3.67 oz/A ¹		
Cucurbit Vegetables	Aphids, Cucumber Beetle (suppression), Flea Beetles, Leafhoppers, Leafminers (suppression), Thrips, Whiteflies	1.66 – 3.67 oz/A	3.67 oz/A	30
Fruiting Vegetables	Aphids, Colorado Potato Beetle, Flea Beetles, Leafhoppers, Leafminers (suppression), Potato Psyllid, Thrips, Tomato Pinworm, Whiteflies	1.66 – 3.67 oz/A	3.67 oz/A	30
Grapes	Japanese Beetle, Leafhoppers, Mealybugs, <i>Phylloxera</i> spp., Sharpshooters	2.67 – 5.67 oz/A	5.67 oz/A	60
Hops	Garden Symphylan, Hop Aphid, Root Weevils	2.67 oz/A	2.67 oz/A	65
Leafy Vegetables	Aphids, Flea Beetles, Leafhoppers, Leafminers (suppression), Whiteflies	1.66 – 3.67 oz/A	3.67 oz/A	30

CROP	PESTS	RATE PER APPLICATION	MAXIMUM RATE PER GROWING SEASON	PREHARVEST INTERVAL (PHI) IN DAYS
Radish	Aphids, Flea Beetles, Leafhoppers, Whiteflies	1.7 – 2.17 oz/A	2.17 oz/A	None listed
Root Vegetables (except Radish and Sugarbeets)	Aphids, Flea Beetles, Leafhoppers, Whiteflies	1.7 – 4.01 oz/A	4.01 oz/A	None listed
Strawberries	Aphids, Grubs, Leafhoppers, Strawberry Root Weevil, Whiteflies	1.7 – 4.01 oz/A	4.01 oz/A	50
Tobacco	Aphids	0.17 – 0.43 oz/1,000 plants	2.67 oz/A	None listed
	Flea Beetles, Japanese Beetle, Tomato Spotted Wilt Virus (TSWV) – suppression of symptoms	0.27 – 0.43 oz/1,000 plants		
	Thrips (suppression)	0.27 oz/1,000 plants		
	Mole Crickets, Thrips, Whiteflies, Wireworms	0.43 oz/1,000 plants		
Tuberous and Corm Vegetables (including Potatoes)	Aphids, Colorado Potato Beetle, Flea Beetles, Potato Leafhoppers, Potato Psyllid, Wireworms (seed piece only)	1.66 – 2.67 oz/A	2.67 oz/A	None listed

* Platinum is not currently registered for use or sale in all states. Please check with your state or local extension service before buying or using this product.

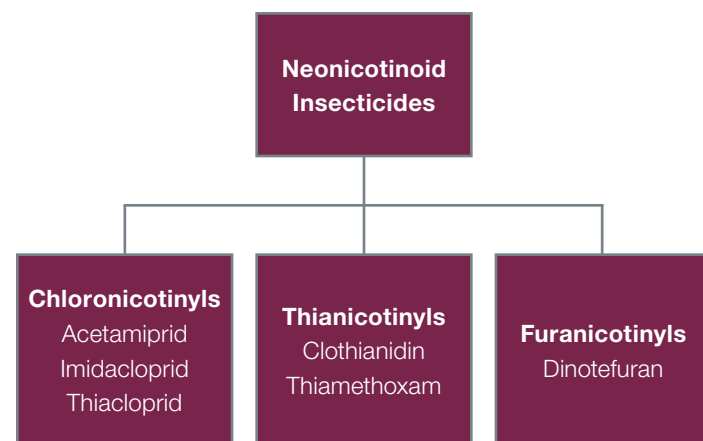
¹ For maximum duration of control use 3.67 oz/A. Use of rates less than 3.67 oz/A may reduce the duration of control.



What is Thiamethoxam?

Thiamethoxam, the active ingredient in Platinum, is a second-generation neonicotinoid insecticide. It has minimal impact on beneficial insects.

There are several active ingredients in the neonicotinoid class of chemistry, but they possess significantly different chemical properties and may even operate at different binding sites. As a result, the neonicotinoid class is divided into three categories: chloronicotinyls, thianicotinyls and furanicotinyls. Thiamethoxam belongs in the thianicotinyl category.



Physical and Chemical Properties of Platinum

Water Solubility	4.1 g/L
Vapor Pressure	2 x 10 ⁻¹¹ mmHg
Partition Coefficient 25 C (log P_{ow})	-0.13
Average Absorption K_{oc}	70.2
Thiamethoxam Half Life (t 1/2)	
Photolysis in Water	2-3 days
Photolysis in Soil	25-32 days (dissolved) 69-132 days (desorption)
Photolysis on Foliage	1-2 days
Hydrolysis	Stable in acidic to neutral pH but hydrolysis increases rapidly at pHs above 7

Mammalian Toxicity

Acute Toxicity / Irritation Studies (Finished Product)

MAMMALS	PLATINUM
Acute Oral LD ₅₀ (Rat)	> 5,000 mg/kg
Acute Dermal LD ₅₀ (Rat)	> 5,000 mg/kg
Acute Inhalation LC ₅₀ (Rat)	> 2.57 mg/L air – 4 hours
Eye Contact (Rabbit)	Mildly Irritating
Skin Contact (Rabbit)	Mildly Irritating
Skin Sensitizer (Guinea Pig)	Not a Sensitizer

Ecological Toxicity

TEST	TECHNICAL
Fish (Rainbow Trout) 96-hour LC ₅₀	> 100 ppm
Fish (Bluegill Sunfish) 96-hour LC ₅₀	> 114 ppm
Bird (Mallard Duck) LD ₅₀ Oral	576 mg/kg
Invertebrate (<i>Daphnia magna</i>) 48-hour EC ₅₀	> 106 ppm
Bird (Bobwhite Quail) 8-day dietary LC ₅₀	> 5,200 ppm
Bee (Contact) LD ₅₀	0.024 µg/bee
Bird (Mallard Duck) 8-day dietary LC ₅₀	> 5,200 ppm
Green Algae 4-day EC ₅₀	> 97 ppm

Environmental Profile

Platinum breaks down quickly in the environment through a variety of mechanisms, and its low use rate further reduces its environmental exposure. Within a few days of application, the remaining active ingredient is bound to the soil, limiting mobility and the potential for leaching. The restricted-entry interval (REI) for Platinum is 12 hours.

Care should be taken when applying Platinum as thiamethoxam is highly toxic to bees.



THIAMETHOXAM IPM COMPATIBILITY		
Beneficial Group	(IOBC Ratings)	
Predatory Mites (<i>Phytoseiidae</i>)		████████████████████
Pirate Bugs (<i>Anthocoridae</i>)		██████████████████
Mirid Bugs (<i>Miridae</i>)		██████████████
Big-eyed Bugs (<i>Geocoridae</i>)		████████████████████
Damsel Bugs (<i>Nabidae</i>)		████████████████████
Lady Beetles (<i>Coccinellidae</i>)		██████████████
Ground Beetles (<i>Carabidae</i>)		████████████████████
Rove Beetles (<i>Staphylinidae</i>)		████████████████████
Lacewings (<i>Chrysopidae</i>)		████████████████████
Hymenopteran Parasitoids		██████████████
Hover Flies (<i>Syrphidae</i>)		████████████████████
Spiders (<i>Araneae</i>)		████████████████████
IOBC Selectivity Rating for Semi-Field Tests		
Harmless	<25%	████████████████████
Slightly Harmful	25-50%	██████████████
Harmful	75%	██████████

Source: International Organization for Biological Control

Integrated Pest Management

Platinum is highly compatible with IPM programs due to its chemical properties and use directions.

Ratings from a study by the International Organization for Biological Control (IOBC) place Platinum in the “harmless” category for most key beneficials.

A reduced-risk insecticide, Platinum has minimal impact on most beneficial insects and meets three of the four criteria pertaining to reduced-risk products¹.

¹Platinum satisfies numbers two, three and four of the following criteria. A reduced-risk pesticide use is defined as one that “may reasonably be expected to accomplish one or more of the following:” (1) reduces pesticide risks to human health; (2) reduces pesticide risks to non-target organisms; (3) reduces the potential for contamination of valued, environmental resources, or (4) broadens adoption of IPM or makes it more effective.

Platinum is also used at extremely low rates. The roots of treated crops rapidly take up Platinum after growers apply it to the soil. Because Platinum remains inside the plant, the product does not contact beneficial insects after its spray solution dries; it only affects insects that chew or suck tissue that contains the product.

How Platinum Works

The roots of germinating seedlings or transplants readily take up Platinum and it rapidly translocates to cotyledons and leaves. Once inside the plant, thiamethoxam is slowly metabolized and is protected from environmental degradation, resulting in extended residual control.

Field research shows Platinum may not be as adversely affected by dry soil conditions as other soil-applied insecticides because it is very water-soluble.

Platinum interferes with the nervous system of target pests through contact or ingestion. Feeding quickly stops and pests usually die within 24 to 48 hours after exposure.

Mode of Action

Thiamethoxam interferes with nicotinic acetylcholine receptors in the insect’s nervous system, which are essential for proper functioning of the nerves. Within hours of contact or ingestion of thiamethoxam, insects stop feeding. Death usually occurs within 24 to 48 hours.

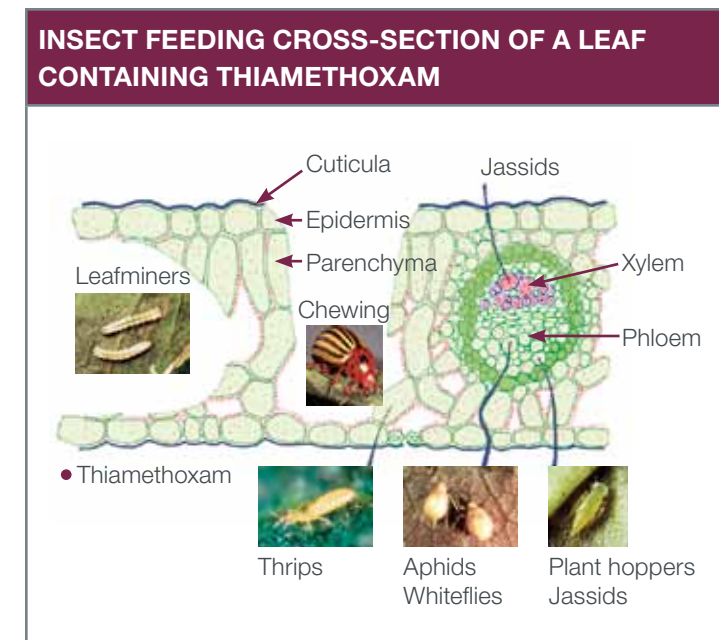
The activity of thiamethoxam, or any insecticide, at the target site is just one factor in its efficacy. When comparing insecticides, other variables – including how the compound interacts with the environment, the plant and the insect – also contribute to its insecticidal mode of action.

The Insecticide Resistance Action Committee (IRAC) has organized insecticides into 28 groups, plus sub-groups, based on their modes of action. Thiamethoxam is a Group 4A insecticide (neonicotinoids). For more information on the mode of action classification, visit the Insecticide Resistance Action Committee website www.irac-online.org.

Behavioral Response of Insects Treated with Thiamethoxam

Insects that come into contact with Platinum show unique behavioral responses after exposure. Sucking insects withdraw their stylets, stretch their legs and move their antennae forward. Both sucking and chewing pests stop feeding, curtailing crop damage shortly after treatment.

In aphids and Colorado potato beetle, symptoms typically begin 15 to 30 minutes after exposure; in adult whiteflies, symptoms usually appear one hour after treatment. Death of exposed insects may occur within a few hours for some species, or may require as long as 48 hours or more for others.



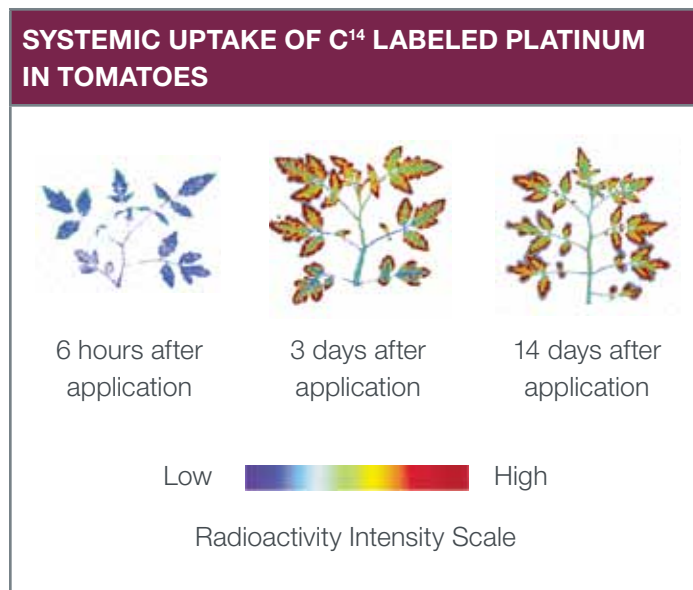
In this diagram, red dots represent thiamethoxam. There is a high concentration of thiamethoxam in the xylem, which provides the product’s transportation route throughout the plant. Pests quickly encounter thiamethoxam throughout the leaf tissue and vascular system by sucking, chewing or mining; damage stops within minutes of exposure.



Platinum Provides Excellent Uptake and Movement of its Active Ingredient

An important physical property of thiamethoxam is its high water solubility. This characteristic leads to rapid plant uptake following soil application and systemic movement into the plant. Once inside the plant, thiamethoxam provides long residual activity because it metabolizes slowly.

If the soil has enough moisture for the plant to germinate and grow, then there will be enough moisture for Platinum to be absorbed into roots and move throughout the plant.

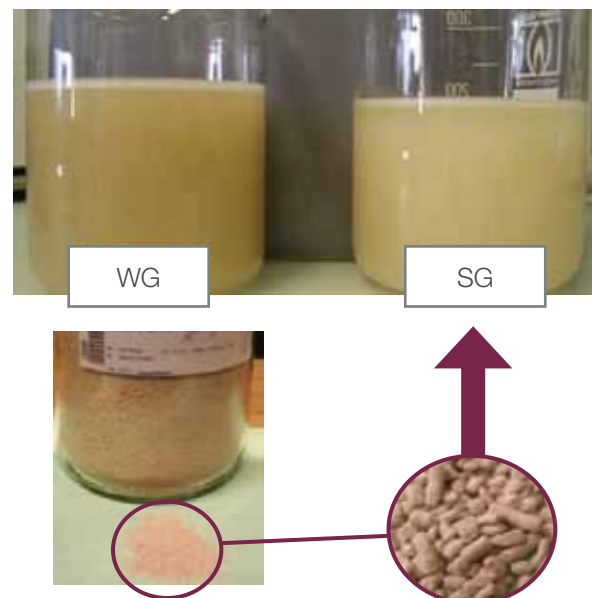


Researchers labeled Platinum with radioactive C¹⁴ and applied it to soil. They observed the leaves from the tomato plants growing in the treated soil during the hours and days following application.

This autoradiograph shows the movement and the presence of thiamethoxam in the cotyledons and the first true leaves at intervals of six hours, three days and two weeks after application:

- Within hours, Platinum translocates in the leaf.
- Three days after application, green, yellow and red areas on the autoradiograph reveal high levels of thiamethoxam throughout leaf tissue.
- Even 14 days after application, thiamethoxam concentrations remain high.

PLATINUM FORMULATION



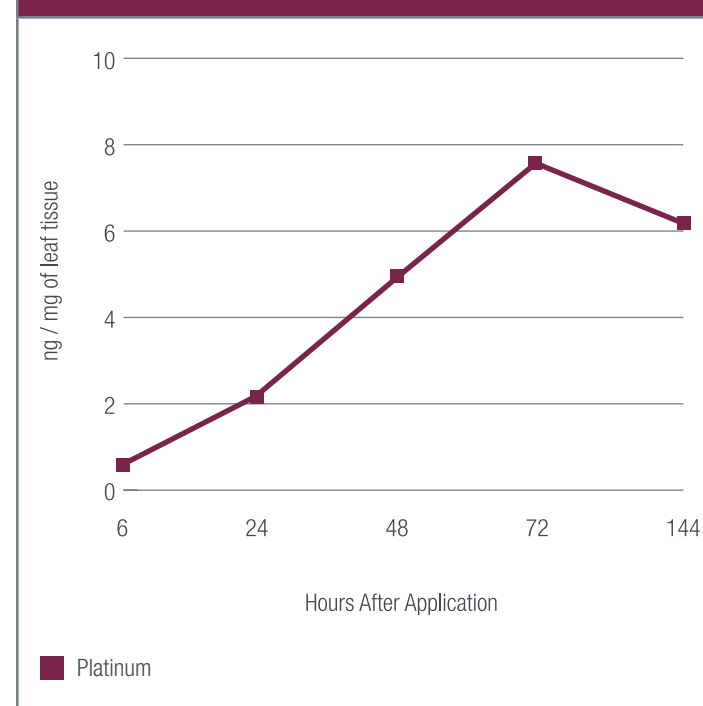
Platinum mixes more easily than other granular formulations.

Platinum has excellent mixing properties and is compatible with starter fertilizers. The easy-to-use formulation requires fewer containers to handle and dispose of after use.

Movement of Platinum in the Soil and the Plant

When growers apply Platinum to the soil, the roots of germinating seedlings or transplants readily take up the product and then it rapidly translocates throughout the plant. Field research shows that dry soil conditions may not adversely affect Platinum as much as other soil-applied insecticides because of its high water solubility. Once inside the plant, thiamethoxam is slowly metabolized, resulting in extended residual control.

MOVEMENT OF C¹⁴ LABELED PLATINUM IN TOMATO PLANTS AFTER A DRENCH APPLICATION



Potted tomato plants were drenched with 100 milliliters of solution containing 5 ppm of radiolabeled chemical. Researchers analyzed samples from the youngest expanding leaf for radioactivity.

Platinum Offers Flexible Application Options

The unique chemical properties of thiamethoxam allow growers to apply Platinum using a variety of application methods.

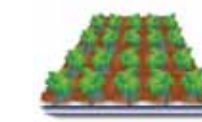
Regardless of the application technique, placing Platinum within the root zone is critical for good plant uptake.



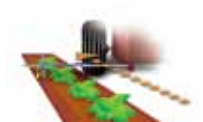
In-furrow application



Drench application



Application through drip irrigation system



Lay-by shanked-in application



Platinum and Resistance Management

Platinum belongs to the neonicotinoid class of chemistry (Group 4A insecticides).

Consider the following proactive resistance management actions when using thiamethoxam:

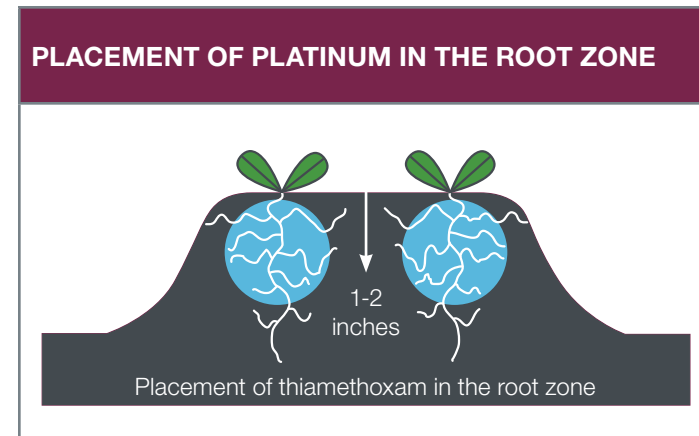
- Apply the effective labeled rate of Platinum through calibrated equipment.
- Limit the number of neonicotinoid applications per crop or per season.
- Alternate chemicals with different modes of action.
- Use labeled rates.
- Use in conjunction with IPM programs.

IRAC Group numbers, prominently displayed on the labels of all insecticides, facilitate the identification of alternate modes of action. Do not alternate Platinum with other Group 4A insecticides. Platinum is highly toxic to bees exposed to direct treatment on blooming crops. Do not apply during prebloom or during bloom when bees are actively foraging. Do not apply Platinum or allow it to drift to blooming crops if bees are visiting the treatment area. This is especially critical if there are adjacent orchards that are blooming.

After a Platinum application, wait at least five days before placing beehives in the treated field. If bees are foraging in the ground cover and it contains any blooming plants or weeds, always remove flowers before making an application. This may be accomplished by mowing, disking, mulching, flailing or applying a labeled herbicide. Consult your local cooperative extension service or state agency responsible for regulating pesticide use for additional pollinator safety practices.

Platinum Best Use Recommendations

- Apply Platinum near the seed or root zone.
- Concentrate the application as close to the seed or root zone as possible.
- If applied to the side or above the seed or root zone, use appropriate irrigation to move Platinum into the plant.
- If applied using low-pressure irrigation systems, apply water for a short period of time, inject Platinum, then apply additional water.

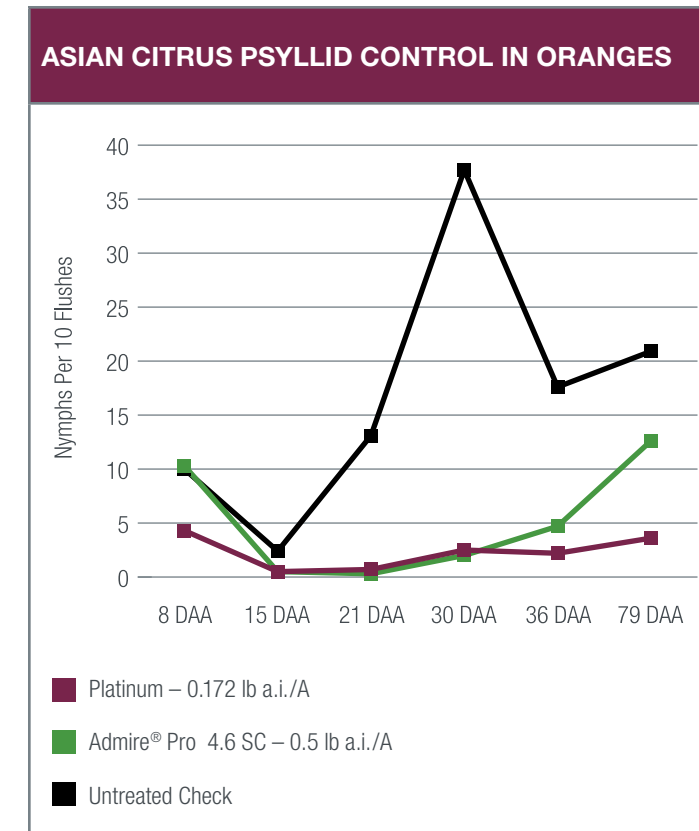


Proper placement of thiamethoxam on the seed or in the root zone is critical for crop uptake. Apply Platinum in the top one to two inches of soil, allowing for easy access by crop roots.

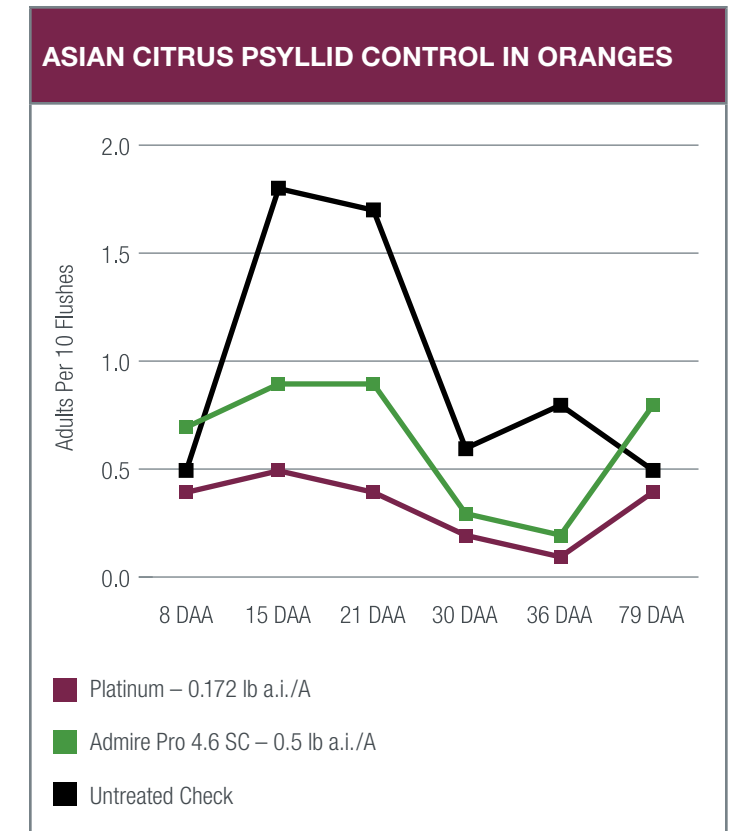
Platinum Performance Results

In field trials across the country, Platinum has delivered excellent control and long residual activity.

(DAA = days after application)

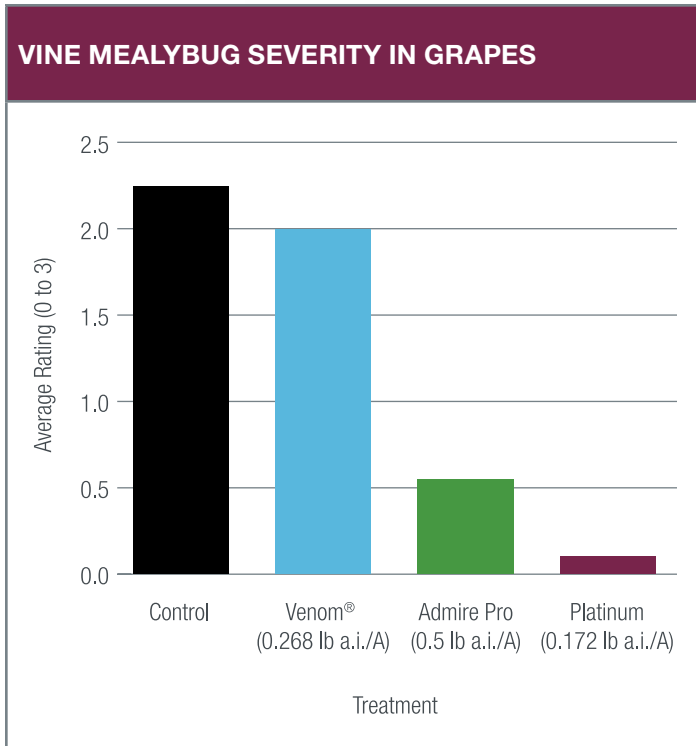


Source: CRO - Avon Park, Fla.

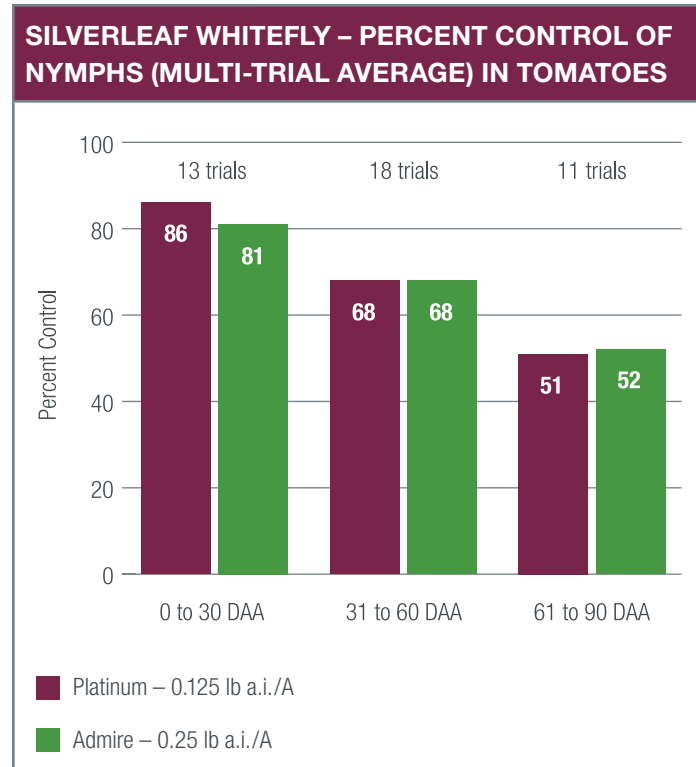


Source: CRO - Avon Park, Fla.

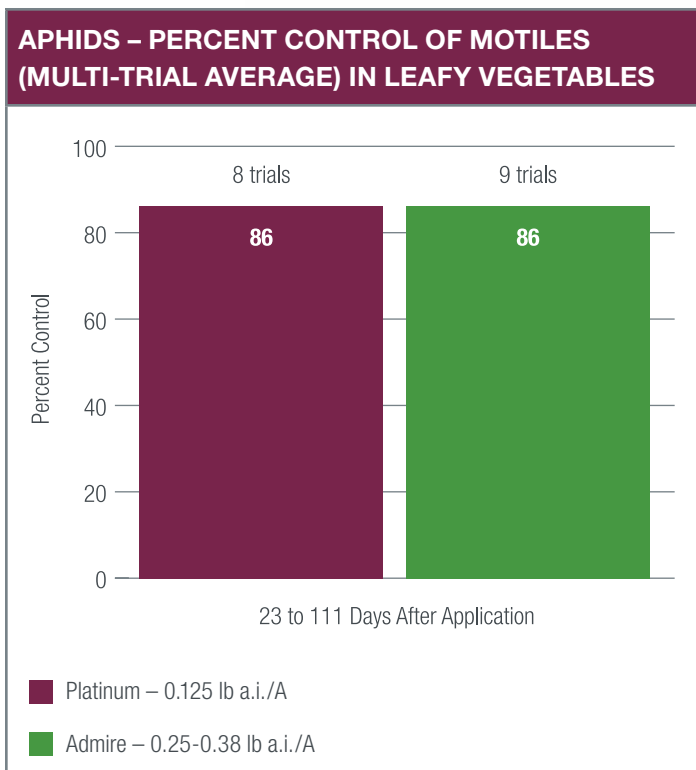




Source: USWC013172008 – UC IPM, Parlier



Source: Trial summary

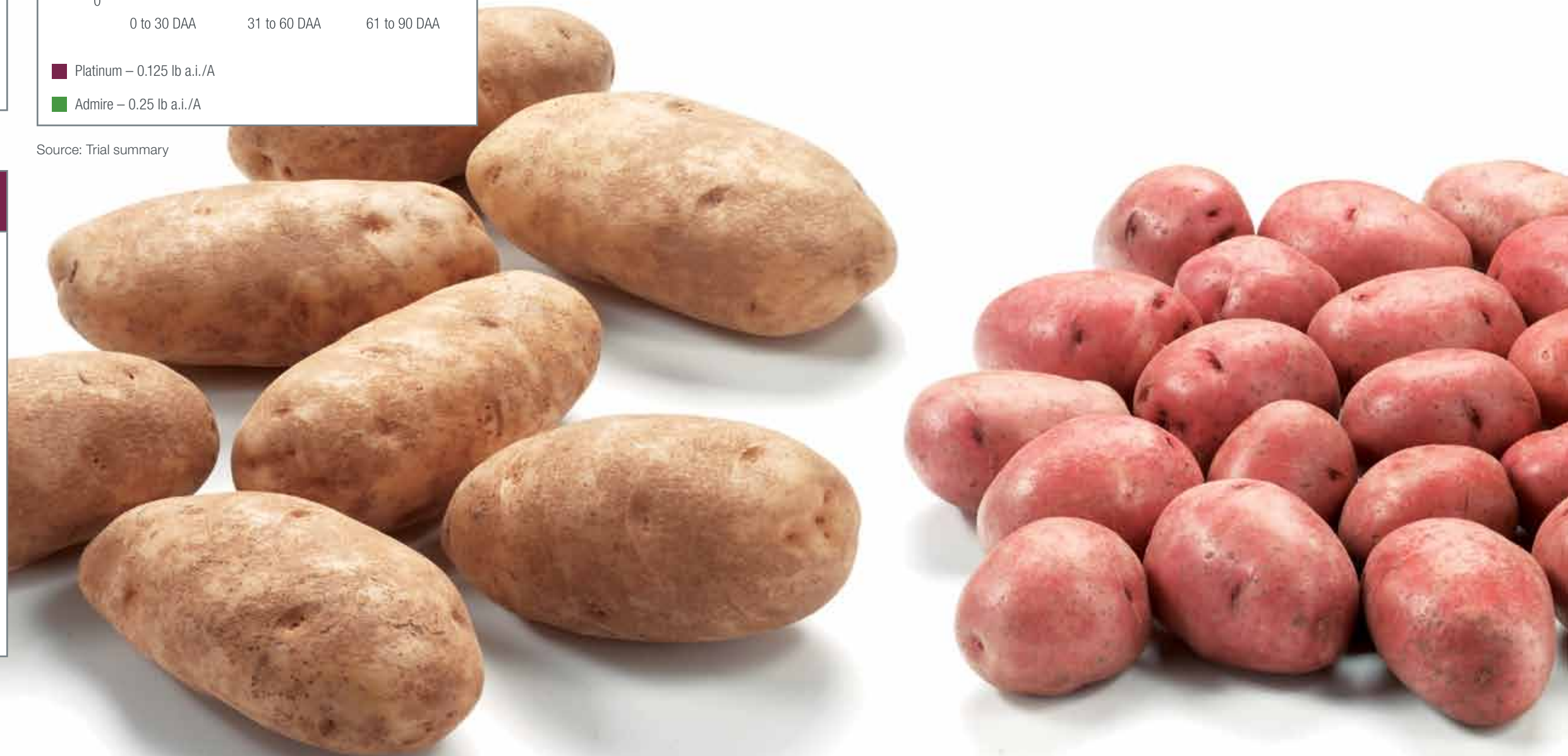


Source: Trial summary

Platinum reflects the Syngenta commitment to creating excellent crop protection products and continually improving them through research, formulation, packaging and broadening label options.

The rapid uptake, outstanding efficacy and long residual activity of Platinum protect a wide range of crops from a broad spectrum of sucking and chewing insects. In turn, it delivers value and peace of mind to growers.

The fact that more than 250 Syngenta representatives across the U.S. support Platinum reinforces that peace of mind. They bring the worldwide resources of Syngenta directly to the farm, addressing challenges locally – field by field – to ensure performance, confidence and value.





For more information, visit these Syngenta Crop Protection websites: www.syngentacropprotection.com, www.FarmAssist.com or call the Syngenta Customer Center at 1-866-SYNGENT(A) (796-4368).

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