




REQUIEM 

Application Guide

Effective control of sucking insects on
high-value fruit and vegetable crops



A contact sucking pest insecticide, REQUIEM® offers fruit, nut and vegetable growers superior protection against a broad spectrum of yield-robbing insects. REQUIEM delivers outstanding performance to help improve vigor and enhance yield.

REQUIEM insecticide works by:

- Directly killing adult and immature whiteflies, thrips, aphids, mites and other pests
- Preventing feeding thus reducing the spread of insect-transmitted viruses
- Conserving beneficial insects and enlisting them as allies in the battle against these pests
- Offering unique modes of action to help preserve valuable insecticide active ingredients already in the marketplace



Insect Control with REQUIEM

Crop group	Mite	Aphid	Thrips	Whitefly
Brassica		X		X
Bulb			X	
Citrus	X			
Cucurbits		X	X	X
Fruiting Vegetables		X	X	X
Grapes	X			
Leafy Vegetables (Lettuce)		X		X
Okra			X	X
Roots & Tubers (Potato)		X		
Tree nuts	X	X		



Modes of Action

REQUIEM insecticide possesses a unique triple activity that is unlike any other product in the market today. The active ingredient in REQUIEM insecticide works to kill target pests in three ways.

- 1. Desiccation:** Insects do not have an internal skeletal system like mammals do. They produce a very hard outer layer called an exoskeleton that protects the insect from the external environment. REQUIEM insecticide attacks the exoskeleton and punches holes in it. This degradation causes a loss of fluids and desiccation occurs. In hot temperatures, one can see desiccated insects within 24 hours.



Adult thrips desiccated, 12 hours after treatment with REQUIEM

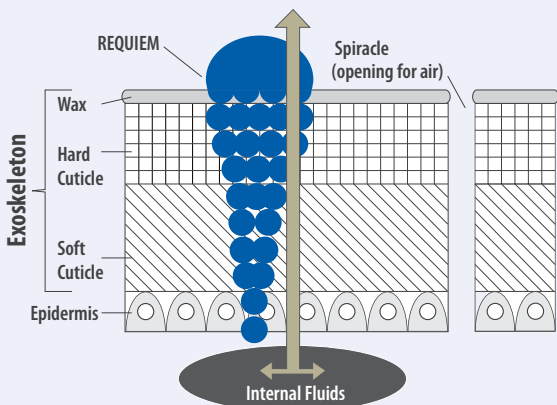
- 2. Asphyxiation:** Respiration in insects is quite different from in mammals. Rather than having a complex organ like our lungs to restore oxygen level and reduce carbon dioxide in the blood, insects rely on a network of tubes, called trachea, to exchange gases. Air passes through openings in the



exoskeleton called spiracles and diffuses throughout the tracheal system. REQUIEM stops this process, which prevents respiration and results in asphyxiation.

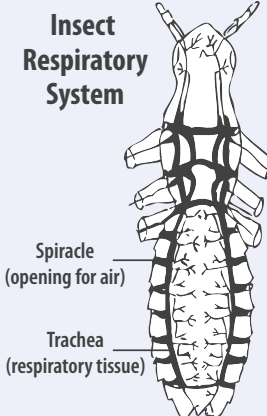
1. Desiccation

REQUIEM insecticide diffuses and dissolves exoskeleton



2. Asphyxiation

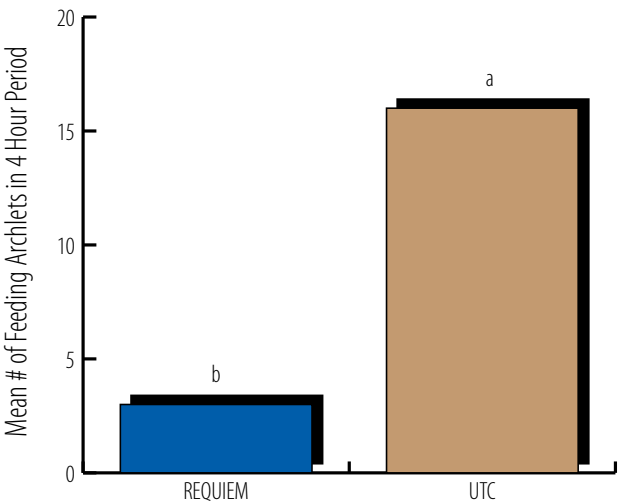
REQUIEM insecticide enters through spiracles and kills tracheal cells. The insect dies because it cannot breathe.



Modes of Action

3. Chemoreceptor confusion: Most insects detect a food source through chemoreceptors located on antennae or feet. Every time one of these pests feeds, it causes plant tissue damage, steals nutrients, and increases the chance for disease transmission. REQUIEM insecticide confuses insects' chemoreceptors, discouraging them from feeding on treated plants. Reduced feeding protects the crop, reduces transmission of viruses, and leads to insect death.

REQUIEM significantly reduces feeding



J. Davis, Louisiana State University, LA – 2008 EPG lab trials, both aphid species data combined 24 hours after application, aphids placed on leaf (80428).



Coverage & Application

- The active ingredient in REQUIEM insecticide is neither systemic nor translaminar and acts primarily through contact. One should consider water volume, tractor speed, spray tips, and spray pressure necessary to get REQUIEM into the places where insects like to hide and feed. Use insecticide-type spray tips and increased pressure to produce smaller droplets for thorough coverage. Complete plant coverage is necessary to prevent feeding as well.

The performance of contact insecticides such as REQUIEM depends on your decisions regarding:

- Spray nozzles
- Spray pressure
- Volume of water per acre
- Tractor speed



Coverage & Application

- **Thrips** often feed in hard-to-reach places such as blooms, under the calyx on fruit or deep within the crown on bulb vegetables.



Thrips feed within the hard-to-reach areas of bulb vegetables

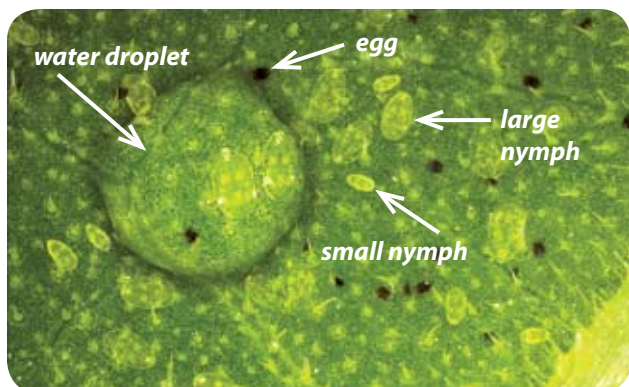
- **Mites** often feed on the undersides of leaves where they produce webbing and lay their eggs. This webbing collects dust and forms a barrier often preventing insecticides from reaching them.



Extreme webbing and "mounding" of mites occurs when plants are left untreated



- **Whiteflies** feed on the undersides of leaves; the nymphs do not move around. They are extremely small so coverage is essential. Increased spray pressure helps move leaves around and produces smaller droplets within the plant canopy.



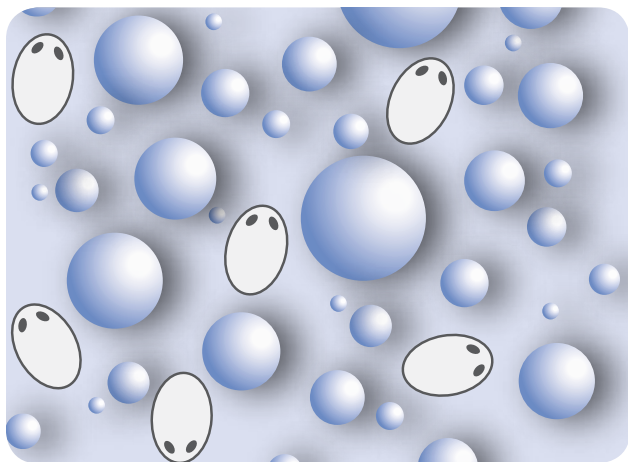
To help prevent feeding and subsequent virus transfer, thorough coverage of the plant surface where the insect feeds is essential. Each time one of these pests inserts its mouth parts to feed, it causes plant tissue damage, steals nutrients, and increases the chance for disease transmission.



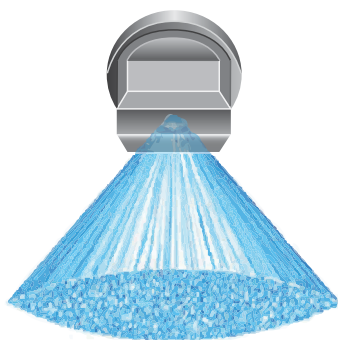
Spray Nozzles

The selection of nozzle type and size is probably the most important part of pesticide application. The nozzle determines the amount of spray applied to a particular area, the uniformity of the applied spray, and the coverage obtained on the sprayed surfaces. The drop size distribution will be dependent on the nozzle type and will vary significantly from one type to another.

- **Flat-fan nozzles** are used for most broadcast spraying of herbicides and for certain insecticides when foliar penetration and coverage are not required. These nozzles produce large droplets and do not provide adequate coverage for insecticides such as REQUIEM. Large droplets can leave areas of foliage untreated. Small insects such as mites and whiteflies may be able to escape contact. Deposition from flat-fan nozzles is heaviest in the center of the pattern and dissipates toward the outer edge. Thus, overlap from adjacent nozzles on the boom is required for uniform distribution. Variations in boom height as you travel across the field can significantly impact spray coverage.



Inadequate coverage caused by large droplets allows insects like whitefly nymphs (depicted here) to escape treatment.



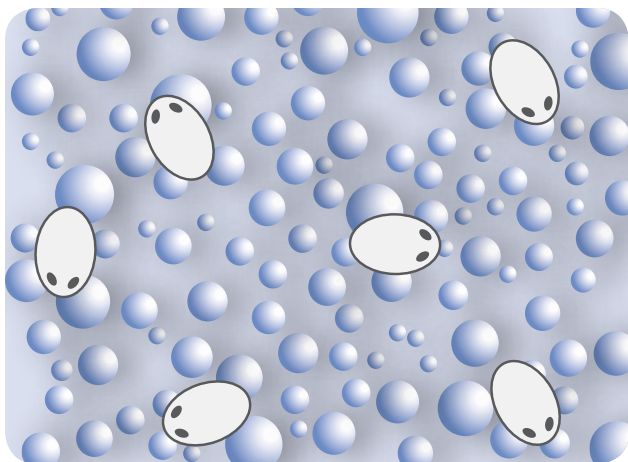
Flat-fan nozzle spray pattern

**FLAT-FAN NOZZLES ARE NOT RECOMMENDED
FOR USE WITH REQUIEM INSECTICIDE**

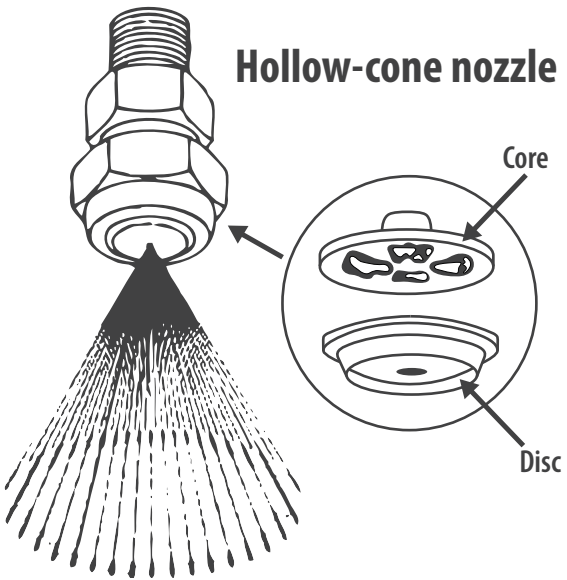


Spray Nozzles

- **Hollow-cone nozzles** (Disc and Core type) are used primarily when plant foliage penetration is essential to achieving effective insect and disease control. These nozzles are good for use with insecticides like REQUIEM. At pressures of 40 to 100 psi, hollow-cone nozzles produce small drops that penetrate plant canopies and cover the undersides of leaves more effectively than other nozzles. The most commonly used hollow-cone nozzle is the two-piece, disc-core. The core gives the fluid a swirling motion before it is metered through the orifice disc, resulting in a circular, hollow-cone spray pattern.



Good coverage resulting from appropriate nozzles means NO escapes.

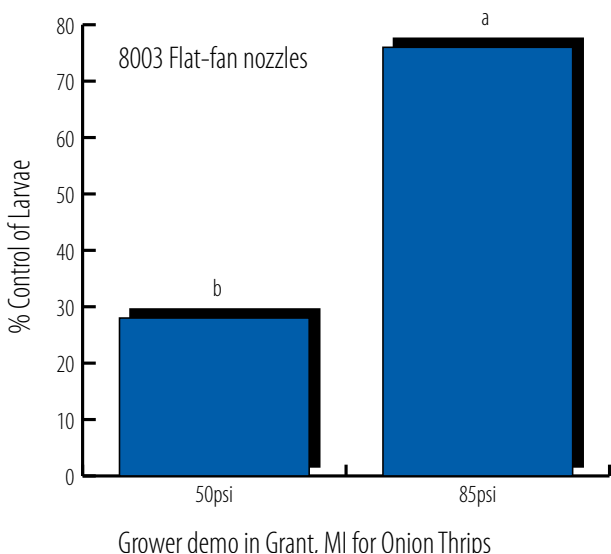


- **Full-cone nozzles** are primarily used for spraying pesticides at higher pressures (200-300 psi) and higher water volumes (200 GPA). These nozzles produce larger, coarse droplets but obtain coverage through sheer volume of water applied per acre. These nozzles are typically used in airblast sprayers in orchards, groves and vineyards. However, when reduced GPA water volume is selected, coverage and performance can be sacrificed.

Spray Pressure

Spray pressure affects droplet size as well; increased pressure reduces droplet size. At 40 psi and higher, finer drops are produced. These smaller droplets increase coverage and performance of contact insecticides such as REQUIEM.

- Large scale grower trials on onions for thrips control were conducted to demonstrate this difference. Increasing spray pressure improved penetration and enhanced control.





Water Volume

- For contact insecticides such as REQUIEM, sufficient water volume is essential for obtaining thorough coverage of all plant surfaces where insects like to hide, reproduce, and feed. REQUIEM has ovicidal activity on key pests such as mites but thorough coverage is necessary.

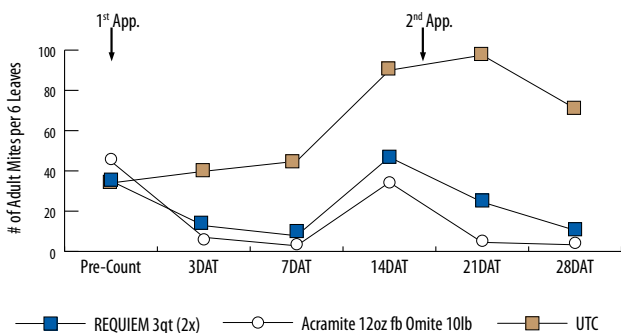
Tractor Speed

- In general, slower speeds are better and produce more consistent results. Slower speeds allow more time for canopy penetration. In addition, faster speeds may require larger nozzles that produce a coarser droplet which may reduce target coverage.



Population Dynamics

REQUIEM, like all other contact insecticides, should be applied when insects first appear, rather than waiting until heavy populations of motiles and eggs are present. If applied to high populations, a second application may be needed to maintain control.



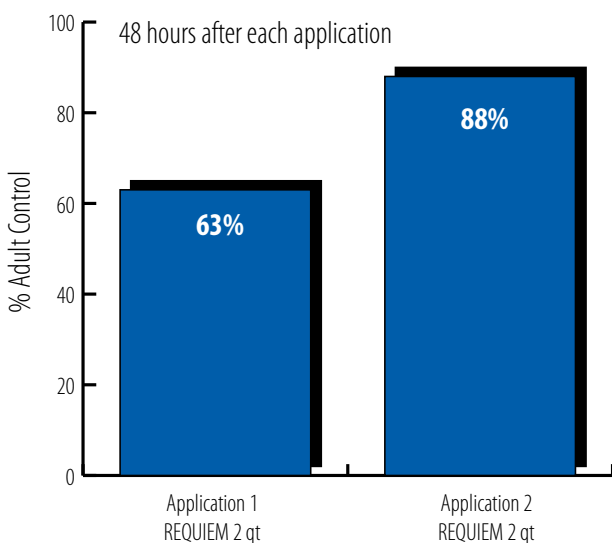
Hulst Research Farm Service, Hickman, CA - 2008. Arrows indicate application timings. Materials applied with air-assist sprayer at 100 psi and 100 GPA.
**Tetranychus pacificus* (80142)



Rescue Situations

Sometimes we find ourselves with a pest population explosion. REQUIEM insecticide has application flexibility allowing for back-to-back applications if you find yourself in a “rescue” situation.

- In this example, a key pepper producer who faced an average of 21.7 Western Flower Thrips per bloom applied REQUIEM insecticide back-to-back two days apart and knocked the extreme insect population down; regaining control.



D. Long and large-scale pepper producer. Boca Raton, FL - 2008. Applications made two days apart under extreme insect pressure (80376)



Benefits of Using REQUIEM

- Other products control some stages of some pests, but REQUIEM insecticide controls adult and immature aphids, mites, thrips, whiteflies and other pests
- REQUIEM insecticide is safe to beneficials and can be used in IPM programs
- REQUIEM insecticide is exempt from tolerances with no detectable residues in harvested crops and no MRL concerns
- REQUIEM insecticide offers unique modes of action for resistance management
- REQUIEM insecticide reduces feeding and the vectoring of some viruses

For more information about REQUIEM,
please visit us online at:

www.requieminsecticide.com

www.agraquest.com





Always read and follow label directions for all products. Information here is not a substitute for the directions on product labels.

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