RADIANT® INSECTICIDE
TOPS EFFICACY TRIALS FOR WORMS & THRIPS

Dow AgroSciences
In university and independent trials throughout the United States, Radiant® insecticide continues to outperform other insecticides on key pests such as armyworm, looper, thrips and leafminers. Two of the field trials shown here were conducted at the Yuma Ag Center in Yuma, AZ, where constant, high pressure is normal, and a variety of insects are simultaneously present in fields. (Yuma Ag Center: http://ag.arizona.edu/aes/yac)

The lab study shown – designed to measure speed of kill with commonly-used insecticides in vegetables – was conducted at the Dow AgroSciences research center in Indianapolis. Results from that study were presented at the 2009 Entomological Society of America annual meeting.

In general, the trials/study results show that Radiant is the fastest, most efficacious insecticide when compared to other insecticides, including IRAC Group 28 (diamide) products like Coragen, Voliam, Synapse and Vetica.

Radiant is the only insecticide that controls worms, thrips and leafminers. Insects are controlled by contact and ingestion, providing quick kill and some residual. Radiant is fast-acting, like a pyrethroid. Insects stop feeding almost immediately, and most are dead within hours after application. (See charts at right.)

Radiant also possesses translaminar activity (through the leaf), which can help with internal feeders (like leafminer) and pests out of the direct line of spray.

Radiant has low impact on populations of most key beneficial insects, including big-eyed bugs, damsel bugs, ladybugs and lacewings. It does not flare mites or secondary pests.

### Rotate Radiant with Intrepid® Insecticide

Rotating Intrepid® insecticide – a Group 18 insecticide – with Radiant is an excellent way to prevent resistance. Intrepid offers long-lasting worm control, won’t disrupt beneficial insect populations and bees, has very short REIs and PHIs and was registered under the EPA’s Reduced Risk Pesticide program.

<table>
<thead>
<tr>
<th>Radiant</th>
<th>Intrepid</th>
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</thead>
<tbody>
<tr>
<td><strong>Signal word</strong></td>
<td>Caution</td>
</tr>
<tr>
<td><strong>Rate</strong></td>
<td>5-10 oz/A (worms)</td>
</tr>
<tr>
<td>6-10 oz/A (thrips, leafminers)</td>
<td>8-10 oz/A (mid-late season or heavy pressure)</td>
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<tr>
<td><strong>Adjuvant</strong></td>
<td>A premium, narrow range oil may help with thrips</td>
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<tr>
<td><strong>Re-entry Interval</strong></td>
<td>4 hours</td>
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<tr>
<td><strong>Pre-harvest Interval</strong></td>
<td>1 day (most vegetables)</td>
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<tr>
<td><strong>Special Instructions</strong></td>
<td>Raise pH of spray mix to 6.0-8.0 or above, then add Radiant.</td>
</tr>
<tr>
<td><strong>Key pests</strong></td>
<td>Worms, thrips, leafminers</td>
</tr>
</tbody>
</table>
Some crops can tolerate a minor amount of pest damage—possibly because the damage doesn’t occur directly on the saleable part of the crop or because the damage does not significantly impair the crop. That is generally not the case with cole crops and leafy vegetables. Pests—like worms—do immediate damage. An infestation of beet armyworms, for example, can wipe out a newly-emerged lettuce stand in less than a day.

In these instances, the speed with which an insecticide actually kills the pest becomes an important attribute of an insecticide. A fast-acting insecticide can help prevent crop injury from a rapidly developing pest population. It also allows the PCA or grower to quickly verify that an insecticide application has been effective.

**Study Background:** A lab study was conducted in 2009 to compare the speed of kill of four active ingredients on four different insects—diamondback moth, cabbage looper, beet armyworm and corn earworm. Second instars were used for each insect. Rates used (and shown in charts) were the mid-point rates in the rate range on the specimen label.

### Active Ingredient | Brand Name
--- | ---
Spinetoram | Radiant
Chlorantraniliprole | Coragen
Flubendiamide | Synapse
Indoxacarb | Avaunt

Cabbage and bell pepper seedlings were sprayed with formulated/commercial product. Leaf discs were cut from the seedlings and immediately placed in plastic trays. Diamondback moth and cabbage looper larvae were placed on treated cabbage leaf discs. Beet armyworm and corn earworm larvae were placed on treated pepper leaf discs.

Larvae were evaluated at various time intervals (after initial exposure) beginning at one hour and ending at 72 hours. Each bioassay was replicated five times.

**Results:** All four insecticides were effective against the four insects, with each causing greater than 80% mortality within 72 hours. For all four insects, the LT₅₀ (time to reach 50% mortality) for spinetoram was significantly shorter than the other insecticides.

On beet armyworm, for example, 80% of the larvae were dead after five hours in the spinetoram treatment. All other treatments showed only 25% dead after five hours.

### Insecticide | Conc pm | Hours to reach 50% mortality (LT₅₀)
--- | --- | ---
Spinetoram (Radiant) | 176 | 5.8  4.2  2.5  2.2
Chlorantraniliprole (Coragen) | 165 | 14.8  16.3  16.7  7.9
Flubendiamide (Synapse) | 115 | 17.7  24.2  16.1  8.9
Indoxacarb (Avaunt) | 265 | 36.1  8.6  12.8  6.7

### % Survival Over Time – Cabbage Looper

![% Survival Over Time – Cabbage Looper](image)

### % Survival Over Time – Beet Armyworm

![% Survival Over Time – Beet Armyworm](image)
University Trial Results

Beet Armyworm Efficacy Trial – Lettuce – 2011
J.C. Palumbo, Yuma, AZ

ox/A

Radiant 5
Voliam Xpress 9
Coragen 5
Vetica 17
Proclaim 3.6
Intrepid 10 + Warrior 1.8
Untreated

No. larvae/plant

dat = days after treatment

Calyx Damage – Peppers – 2011
(Combined damage from fruitworm, beet armyworm, pinworm)
J. Trumble (UC Riverside), Santa Ana, CA

oz/A

Radiant 6
Lannate+Pounce
Admire/Movento + Baythroid/Oberon + Synapse
Intrepid+Pounce
Voliam Flexi+Dipel
Untreated

Damaged fruit (%)

Western Flower Thrips Efficacy Trial – Romaine – 2011
J.C. Palumbo, Yuma, AZ

ox/A

Radiant 7 oz/A
Lannate+Warrior
Lannate 0.75 lb/A
Warrior 1.9 oz/A
Untreated

No. immatures/plant
The Insecticide Resistance Action Committee (IRAC) promotes the use of a Mode of Action (MoA) classification of insecticides as the basis for effective insecticide resistance management (IRM). Successful IRM programs prevent or delay the evolution of resistance to insecticides.

Insecticides are assigned to specific “groups” based on their target site of action. The IRAC classification provides an aid when choosing an insecticide for these types of IRM strategies. Several sprays of an insecticide may be possible within each spray window, but it is generally essential that successive generations of the pest are not treated with compounds from the same MoA group.

It is important to recognize that it is usually easier to proactively prevent resistance occurring than it is to reactively regain susceptibility.

No other class of chemistry – organophosphates, carbamates, pyrethroids, neonicotinoids, diamides – affects insect nervous systems with the same mode of action as spinetoram, the active ingredient in Radiant.

Following is a partial list of insecticides used for insect control in vegetables. More IRAC information can be found at www.irac-online.org.
To Learn More

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www.dowagro.com  1-844-022 EF (4/12)  010-33509