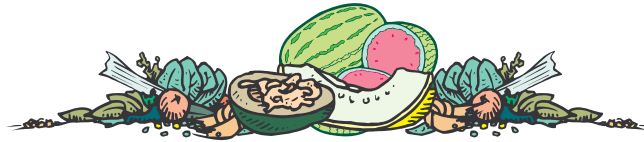


# VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the  
Purdue University Cooperative Extension Service

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**WHAT TO SPRAY** - (Dan Egel) - Many of the phone calls I receive go something like this: "I need to spray my melons this evening. Is there anything special I should put in?" Let me try to address some of these questions.

**Protective fungicides:** Such chemicals include Bravo, Echo, Dithane, Penncozeb, Maneb 80, Manex, Ziram 76DF etc. These products should be the bulk of your pesticide applications. Most pesticide applications will consist only of the protective chemical of your choice. If you are a watermelon or muskmelon grower in southwest Indiana you may rely on MELCAST to tell you when to apply these chemicals. Note: Novartis/Zeneca consider Quadris and Flint to be protective chemicals with systemic activity. For more on these chemicals, read below.

**Protective with systemic properties:** These chemicals are considered protective chemicals with systemic properties. These chemicals include Amistar and Quadris (both these chemicals have the same active ingredient) Cabrio, Flint, Tanos, Pristine, etc. Apply these chemicals as you would any of the protective chemicals listed above. Do not wait until disease shows up and then expect these chemicals to clean up the problem entirely.

**Systemic chemicals:** Examples would be Nova and Topsin: these chemicals are effective as powdery mildew fungicides for muskmelon. For most foliar fungal diseases such as gummy stem blight of watermelon or early blight of tomato, however, we recommend the protective chemicals listed above. Ridomil Bravo Gold: this chemical can be applied when Phytophthora is known to be a problem, for example, buckeye rot of tomatoes.

**Copper:** Copper is a protective chemical. This chemical is more affective for bacterial diseases than for fungal diseases. Diseases for which copper products would be affective include bacterial fruit blotch of watermelon, bacterial spot of peppers and

tomatoes, and bacterial speck of tomatoes. Unless you have a bacterial disease, copper is not as affective as the protective chemicals listed above.

**Insecticides:** As a general rule, do not apply insecticides unless a problem is noted. The application of insecticides on a weekly basis results in a lower beneficial insect population and thus MORE problems, not less. A common practice among those who study insect pests of vegetables is to apply insecticides to destroy beneficial insects such as ladybugs and lacewings.

It is OK to call me about what to spray. But I hope this list will help.



**A BAD APPLE OF PERU COULD SPOIL WHOLE BUNCH OF CROPS** - (Steve Leer) - In the garden world, apple of Peru (Figure 1) is known for its beautiful purple flowers and its ability to repel insects. In agricultural fields, however, it shows a different face - a nasty, invasive one - and it could become the next weed nightmare for field and vegetable crops in Ohio and other areas of the United States.



Figure 1. Apple of Peru with flowers and fruit. (Picture by D. Doohan & J. Felix, Ohio State University)

Apple of Peru, or shoo-fly, has been known to exist in the United States for a long time. But only in recent years did the weed make its way into farmland, invading fields in Georgia, North Carolina, Tennessee, Virginia, and Ohio.

“Some of our most common and problematic weeds today, such as velvetleaf, giant ragweed and giant foxtail, were not found or were rare in this region 40 or 50 years ago but now cost Ohio farmers millions of dollars to control every year,” said Doug Doohan, a weed ecologist with the Ohio Agricultural Research and Development Center (OARDC) in Wooster, Ohio.

“We think that apple of Peru is following that same trajectory, but not as slowly. Five years ago we didn’t even know of its existence in farm fields, and we now already have at least 2,000 acres infested in Ohio.”

Apple of Peru was discovered by OARDC researchers in a Sandusky County, Ohio, pepper field in the summer of 2002. Subsequent field surveys have found the weed in at least 20 farms in Sandusky and Seneca counties, affecting corn, soybeans, bell peppers and tomatoes.

A native of the Andes region in South America, apple of Peru belongs to the same family, Solanaceae, as tomatoes, peppers and potatoes. Leaves are arrowhead-shaped and pointed at the tip, with irregularly toothed margins. During July and August, the plant produces light-purple (occasionally white), trumpet-shaped flowers that develop into papery bladder-like structures encasing a single berry (Figure 2). It can grow up to six feet tall.



Figure 2. Apple of Peru berry surrounded by the calyx. (Picture by D. Doohan & J. Felix, Ohio State University)

Doohan said the real extent of the weed in Ohio is unknown because it can be easily mistaken for other plants. At an early stage, apple of Peru is similar to eastern black nightshade, a common weed in vegetable crops. In its later stages, it looks like common ground cherry and bears similar fruits, the only difference being the brittle fruit of the weed versus the pliable fruit of the ground cherry.

Gardeners share and trade apple of Peru for its attractive flowers and its “shoo-fly” ability. The plant serves as an insect repellent, and some people grow it in their gardens and rub it on their skin.

But while apple of Peru may be good at keeping bugs away, it also can attract a swarm of problems.

“What makes the situation with apple of Peru potentially serious is that it is more difficult to control than most weeds,” Doohan explained. “It produces a very persistent seed that can survive in the soil in the dormant phase for many years, always waiting for that opportunity to come along and grow and produce seed on its own. And while we have herbicides that will control giant ragweed or velvetleaf, we have not been successful at finding many herbicides that are effective on apple of Peru.”

Doohan and collaborators have tested some 25 herbicides for their effectiveness to control apple of Peru. Of those, only four show any promise - but they have their shortcomings, too.

“The herbicides that are effective on apple of Peru are older-type materials, like atrazine, which have greater environmental impact when used than more modern products,” Doohan said. “So the most likely scenario is that farmers that have apple of Peru will have to go back to using older types of herbicides. They may have to use a rate of atrazine higher than we would like to see farmers using. This creates greater hazard to the environment.”

For farmers who grow vegetables in rotation with corn, the situation is bleaker. Doohan said the rate of atrazine that is required to control apple of Peru would prohibit the planting of vegetables the following year because the residue left by the herbicide in the soil would seriously damage, if not kill, the vegetable crop.

“This also means that farmers would have to grow more high-volume, low-value crops like corn and soybeans in preference to the high-value, low-acreage crops like tomatoes and peppers simply because they can’t control apple of Peru in those vegetable crops like they can in corn,” he pointed out.

Apple of Peru has quickly caught the attention of vegetable growers. Elwood, IN - based Red Gold Inc., the nation’s largest tomato processor outside California, has looked into what the weed would do to the industry if it becomes established in the Great Lakes’ tomato processing acreage.

“Their analysis indicates that it would take a money-making enterprise and turn it into a money-losing business,” Doohan said. “That’s a worst-case

scenario, but it has happened before with weeds, and it could happen again.”

Apple of Peru is bad news for soybeans, too. In recent studies, Doohan found that a relatively small population of the weed - about 1,400 per acre, “which you’d be able to see but wouldn’t think of as a terribly big weed problem” - reduced soybean production between 15 percent and 25 percent.

The damage caused by this weed in other parts of the globe has Doohan concerned about what it could do to Ohio. Apple of Peru has become the worst weed problem for soybean farmers in Brazil, one of the world’s leading soybean producers. It also affects crops in Africa, Asia and Australia.

“We’ve been meeting with farmers, landowners and crop consultants to educate them about apple of Peru,” Doohan said. “We’d like to contain this weed and, even better, eradicate it from the areas where it’s currently found. If that doesn’t happen, we are afraid it will become a huge problem for farmers.”

Doohan and his team will conduct field trials this summer to further test herbicides and their effectiveness against the weed. The researchers also are seeking funding to study the populations of apple of Peru present in Ohio and compare them with those found elsewhere in the United States and in other countries. Such a study would allow them to pinpoint the origin of the population affecting Ohio, which is still unknown.

For more information about apple of Peru or to obtain a laminated pocket identification card, contact OARDC’s Weed Ecology Lab at (330) 202-3593 or the Sandusky County office of OSU Extension at (419) 334-6340.

This article is reprinted from Ag Answers, for more information check out their Web site: <[www.aganswers.net](http://www.aganswers.net)>.



**SOME GRAPE INSECT PESTS - (Frankie Lam)** - The following insects are grape pests that were collected at southern Indiana during the first week of June. Most of these insect populations seldom cause economic damage; however, it is an advantage for grape growers to identify these pests. Not much research had been done for the management of these insects. If high populations of these insects were observed in vineyards, please notify your county agent or call (812) 886-0198 at Southwest Purdue Agricultural Center.

**Grapevine Beetle.** Dull reddish brown beetle about one inch long has two black dots on sides of collar (thorax) and three black dots on sides of elytra (hardened front wings) (Figure 1). The beetle belongs to the same family of the May or June Beetles. The larvae feed on decaying wood, whereas the adults feed on leaves and fruits of grapes.



Figure 1. Grapevine beetle. (Picture by F. Lam)

**Whitelined Sphinx and Achemon Sphinx.** Several species of sphinx moth larvae feed on grapes, including whitelined sphinx (Figure 2) and achemon sphinx (Figure 3). The adults are stout moths have powerful wings that are colorfully patterned. The moths beat their wings so rapidly that some species resemble



Figure 2. Whitelined sphinx. (Picture by F. Lam)



Figure 3. Achemon sphinx. (Picture by F. Lam)

hummingbirds or large bees. Thus, sphinx moths are also known as hummingbird moths or hawk moths. The wingspan of whitelined sphinx is about four inches, whereas for achemon sphinx is about five. The adults of whitelined and achemon sphinxes feed on the nectar of flowers, while their caterpillars feed on the foliage of plants, including wild and cultivated grapes. The caterpillars of sphinx moths are usually hairless, stout, green or reddish, and have a large hornlike structure at the end of the body (Figure 4). The caterpillars of this insect family are commonly known of hornworms.



Figure 4. Larva (hornworm) of a whitelined sphinx. (Picture by F. Lam)

**Grape Leaf Skeletonizer.** The moth has narrow wings and wingspan about one inch. Body, wings, antennae, and legs are dull blue to black color. The collar is orange and the antennae are narrowly feathered (Figure 5). Caterpillars, which are yellow with black spots and spines, feed on foliage of grapes. Small caterpillars do not eat the leaf veins and leave the foliage like a skeleton.



Figure 5. Grape leaf skeletonizer. (Picture by F. Lam)

**Eightspotted Forester.** The moth's body and wings are velvety black and about one-and-a-quarter-inches in wingspan (Figure 6). Both front and hind wings have two yellowish white spots. There are bright orange scales on the first two-pairs of legs. Caterpillars, which are bluish white and marked with black and orange bands, feed on ivy and grapes.



Figure 6. Eightspotted forester. (Picture by F. Lam)

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