

# VEGETABLES®

A SPECIAL GROWERS' REPORT OF AG ALERT®



Photos/ Greg Kund, Trumble Lab at UC Riverside

Plants grow in pepper research field, top, at the University of California, Riverside. The university's Trumble Lab is working on integrated pest management approaches that can help target pepper plant threats such as the beet armyworm, right.

## Renowned research center targets pests in peppers

By Kathy Coatney

John Trumble, who retired from a laboratory that now bears his name, researched pepper pests for 25 years.

He showed tomato growers in Mexico how to make more money and produce safer products by rotating chemicals and using softer materials. His research was instrumental in moving farmers in California and elsewhere to integrated pest management approaches.

Now the work of the Trumble Lab at the University of California, Riverside, lives on with a new staff associate, Greg Kund, taking over the research.

These days, Kund is using the UC Riverside agricultural field station to plant half an acre to an acre of peppers on which to apply anywhere from six to a dozen different treatments.

Kund is working under Tom Perring, professor of entomology at UC Riverside, in undertaking multi-tiered research for the California Pepper Commission.

"It was a natural progression for me just to take over the project and keep it going," Kund said of following in Trumble's research footsteps.

The continuing work also involves conducting pest control studies for outside companies.

"If they have new products that they want to bring to market, then they'll come to us and ask us to test some of these in our field trials," Kund said.

Those trials include either laboratory-based tests or field tests, depending on the stage of development of the products. Kund said he tests pest control methods "to determine

the efficacy of those products against the specific insect complexes that are associated with peppers."

Insect pressure varies year to year, but pepper weevils are a focal point, Kund said.

"That's one of the targeted pests that they really are concerned about," he said. "And it's hard to find products that are effective against pepper weevils."

Lepidopteran pests, which feed on the peppers, are problematic and Kund said researchers are attempting to control them with different products.

There are other insects that carry vector viruses and bacteria. They include whiteflies, aphids, thrips and potato psyllid, also called pepper psyllid.

"We'll target these insect complexes with different materials within an IPM program and see what works well against them to limit the spread of viruses and bacteria," Kund said.

Some products may work well against lepidopterans. But the same product may not be effective against sucking insects such as aphids, and the label will be restricted to reflect that, Kund said.

Using compounds such as a pyrethroid that are effective against multiple insect species can cause other problems, he said. For example, if a compound is applied and it kills a broad spectrum of insects, it may also kill beneficial insects that help control the insect

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# Research

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populations, Kund added.

“You can actually get secondary pest infestations,” he said.

For instance, spraying pyrethroids weekly and not rotating with other chemicals could result in a huge leafminer problem at the end of the year.

“I’ve seen fields where the leafminer larvae are literally falling off of the leaves of a plant,” Kund said.

That creates a disastrous situation for growers, he said, which is why an IPM program is so important.

That was the approach fostered by John Trumble: helping growers profit while using safer pest control products in rotation with varied chemical applications to guard against resistance building.

Kund’s program tests a new product for a year. Then it is evaluated on how well it worked. If it is effective for a particular insect complex, it will be incorporated into an IPM program and rotated with other chemicals, Kund said.

Another portion of the program includes an organic rotation in which researchers use only registered products from the Organic Materials Review Institute, Kund explained. These are much softer products and they may need to be used a little more often, depending on the pest pressure, he added.



Photo/Photo: Greg Kund, Trumble Lab at UC Riverside

Pepper weevils, such as the one above, pose a major threat to peppers. Researchers say they need to be treated early or their larvae will penetrate peppers, causing significant internal damage.

There are also what Kund calls in-between products that are biorational—a softer product.

“Biorational compounds have to be rotated with something else,” he said, adding that many chemical companies are realizing their products are not stand-alone remedies.

“The biorational compounds are more effective when they’re used early,” he said. “That’s really important. If you wait until the problem is out of control, then it’s too late.”

He said more conventional products will have to be used to control the pest.

Pepper weevils, for example, can do a lot of damage, so it’s important to treat them early because they’re so invasive and the larvae do so much damage to the inside of the fruit.

“That’s one where conventional materials are kind of important to use early on,” Kund said.

Organic growers could use a pyrethrin for pepper weevils, not to be confused with a pyrethroid. Pyrethroids are a synthetic material, whereas pyrethrins are taken from a plant extract. Pyrethrins are safe, but still have some neurotoxin activity that may provide some control for

pepper weevils, Kund said.

Weather definitely affects pest pressure, Kund said.

“This year, for whatever reason, I’ve seen a lot of spider mites out in my field,” he said. “It’s hot and it’s dry, and spider mites like those conditions.”

With the fluctuation of insect pressure year to year, growers have to adjust their programs accordingly, Kund said. It’s important for pest control advisors and growers to get into the field and identify potential problems early, he added. Trapping can help with early identification of pests.

Kund has used some pheromone traps for pepper weevil as more of an identification tool.

“It kind of gives you a good idea of what’s going on in the field,” he said, “and it tells growers when they start to see pepper weevil that they need to treat now.”

There are pheromone traps and mating disruption pheromones for the lepidopterans. Placed in the field, pheromone traps confuse the males so they can’t find the females to mate.

“That really disrupts the whole reproduction process,” Kund said.

*(Kathy Coatney is a reporter in Bend, Oregon. She may be contacted at kacoatney@gmail.com.)*

## Pests

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Sacramento Valley locations weekly to help growers anticipate pest population increases.

“It’s been a very good year for armyworms,” he said.

Growers also have had more success controlling rice blast this year, apparently in part because more growers are planting the medium-grain variety M-210, which is resistant to the disease.

Espino said resistant varieties and nitrogen management are important in controlling rice blast, a fungal disease that survives on rice straw. When severe, it can kill young rice plants.

Aggregate sheath spot and stem rot are two other diseases that are usually present at some level in most rice fields.

“A lot of this has to do with the buildup of inoculum, because we haven’t burned (rice straw) in quite a few years,” Espino said.

The first step in managing these diseases is to reduce the carry-over inoculum by removing or destroying crop residue or—in the case of stem rot—by using resistant varieties.

Stem rot can be made worse in fields with stands that are too densely planted.

Fungicides can be effective against both of these diseases. But careful monitoring is needed to get there in time and be confident the application will be worth the cost, Espino said.

*(Bob Johnson is a reporter in Sacramento. He may be contacted at bjohn11135@gmail.com.)*





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