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# Wine Spectator

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## The Deadly Threat to California Wine

A small insect called the glassy-winged sharpshooter is threatening California's vineyards with a plague of biblical proportions. If the dire predictions come true, the Golden State's wine industry could be devastated for many years to come.



OCT. 15, 2000  
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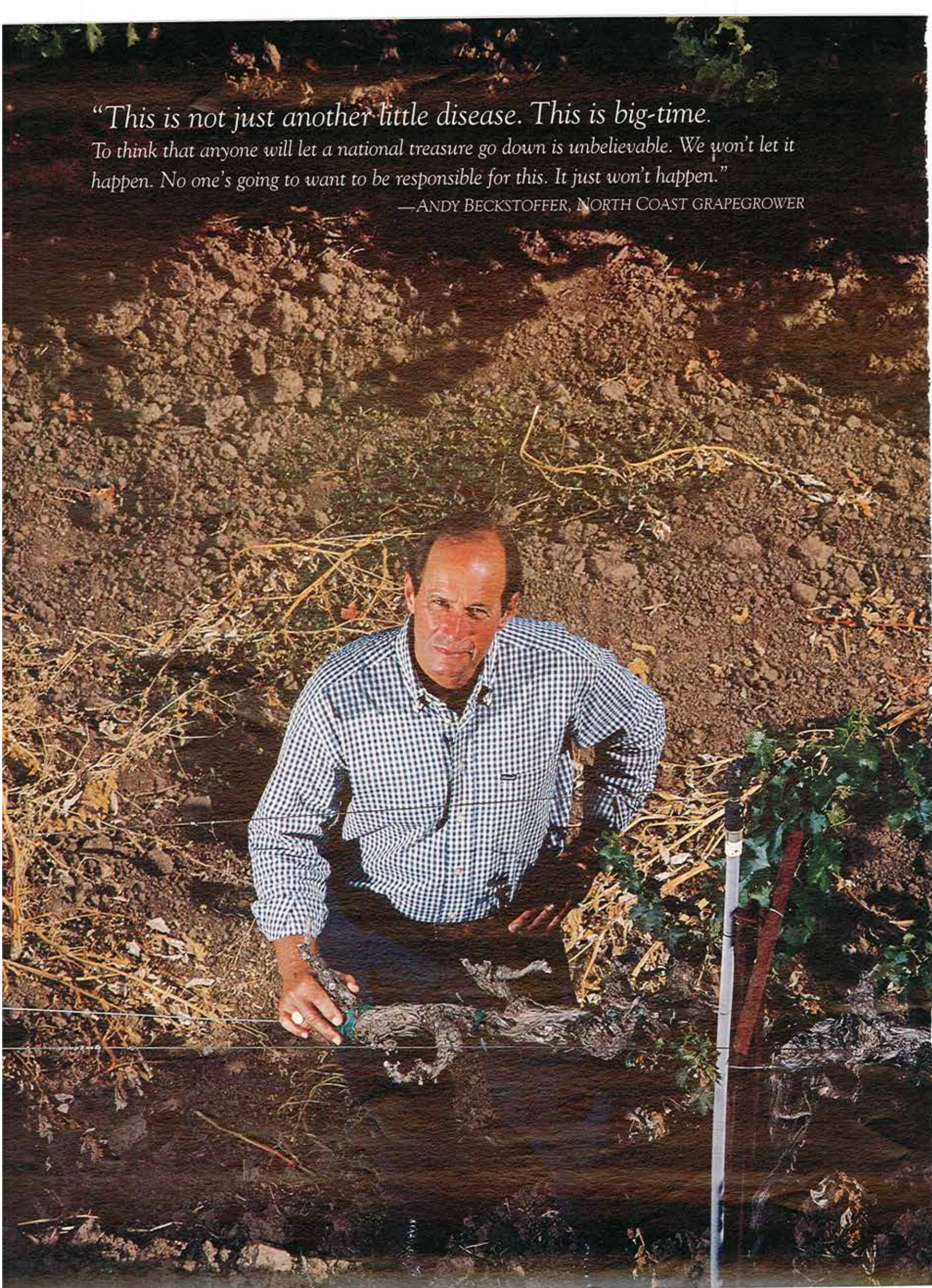
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*“This is not just another little disease. This is big-time.*

*To think that anyone will let a national treasure go down is unbelievable. We won't let it happen. No one's going to want to be responsible for this. It just won't happen.”*

—ANDY BECKSTOFFER, NORTH COAST GRAPEGROWER





These grapevines in the Temecula region of Southern California have been blighted by Pierce's disease, an old malady that is being spread by a virulent new carrier insect: the glassy-winged sharpshooter. Above, right: Grapes on a stricken vine.

RACHEL WEILL



## CALIFORNIA VINEYARD APOCALYPSE

AN OLD DISEASE SPREAD BY A VORACIOUS  
NEW CARRIER THREATENS DEVASTATION IN  
WINEGROWING DISTRICTS ACROSS THE  
STATE BY DANIEL COUGER 🍇 🍇 🍇

Time may be running out on the California wine industry as we know it. A leaf-hopping insect called the glassy-winged sharpshooter is rapidly transmitting Pierce's disease, an incurable grapevine malady that has devastated vineyards in Southern California and could wreak horrific damage if carried by the insect to the rest of the state.

State officials, growers and scientists are desperately scrambling to contain the creature while they devise a cure, but experts concede that the industry might be chasing a runaway train. The insect has already infested 11 counties, including Sacramento, just 70 miles east of Napa Valley. In late July, a single glassy-winged sharpshooter was trapped in the small town of Middletown in Lake County—less than a dozen miles from vineyards in Napa and Sonoma counties. The response was immediate. County agricultural inspectors

descended on Middletown, scrutinizing literally every leaf in the nursery where the insect was found. They then sprayed the nursery with pesticide and quadrupled the number of bug traps throughout the area. Inspectors went door-to-door, canvassing all the surrounding properties for additional evidence of the glassy-winged sharpshooter.

"We're feeling like we're sitting on a time bomb," says Robert Dowell, chief entomologist for the California Department of Food and Agriculture, which is coordinating the statewide response to the threat. "And it's just sort of ticking away, and the problem is that nobody knows where the bomb is, and nobody knows how fast it's ticking, and nobody knows how much time is left."

**W**hile Pierce's disease has plagued California grapegrowers for 120 years, it has remained largely under control, with two exceptions: a severe outbreak in the late 19th century in Southern California, and another in the Central Valley in the 1940s. Historically, Pierce's disease has been transmitted in the prime vineyard regions of Northern California by the blue-green sharpshooter, a less prolific species that does most of its damage within 100 yards of streams and other watercourses.

Yet the glassy-winged sharpshooter, a native of the southeastern United States that arrived in California sometime in the late 1980s, threatens to change all that. Because it is bigger and more mobile and can survive by feeding on a wide range of plants, it could potentially cause billions of dollars in damage and wipe whole grapegrowing districts off the map.

Lacking a cure for Pierce's disease, local, state and federal officials, along with leading trade organizations such as the

Wine Institute, have focused their efforts on detecting and eradicating the glassy-winged sharpshooter—a daunting task in a state as big as California. In June, Vice President Gore announced that the U.S. Department of Agriculture was declaring the situation an emergency and would provide an additional \$22.3 million in funding, beyond the \$25.3 million already earmarked by government and industry sources. Those efforts may represent just a beginning, however, if the glassy-winged sharpshooter proves to be as tough an adversary as some researchers fear it might.

After studying the insect for 17 years, Russ Mizell of the University of Florida believes that it may currently be unstoppable. "There's not a whole lot of data suggesting that [the glassy-winged sharpshooter] will do anything but spread throughout the entire state of California," he says. "It's just a question of when is it going to happen, how long it takes—and can you slow it down?"

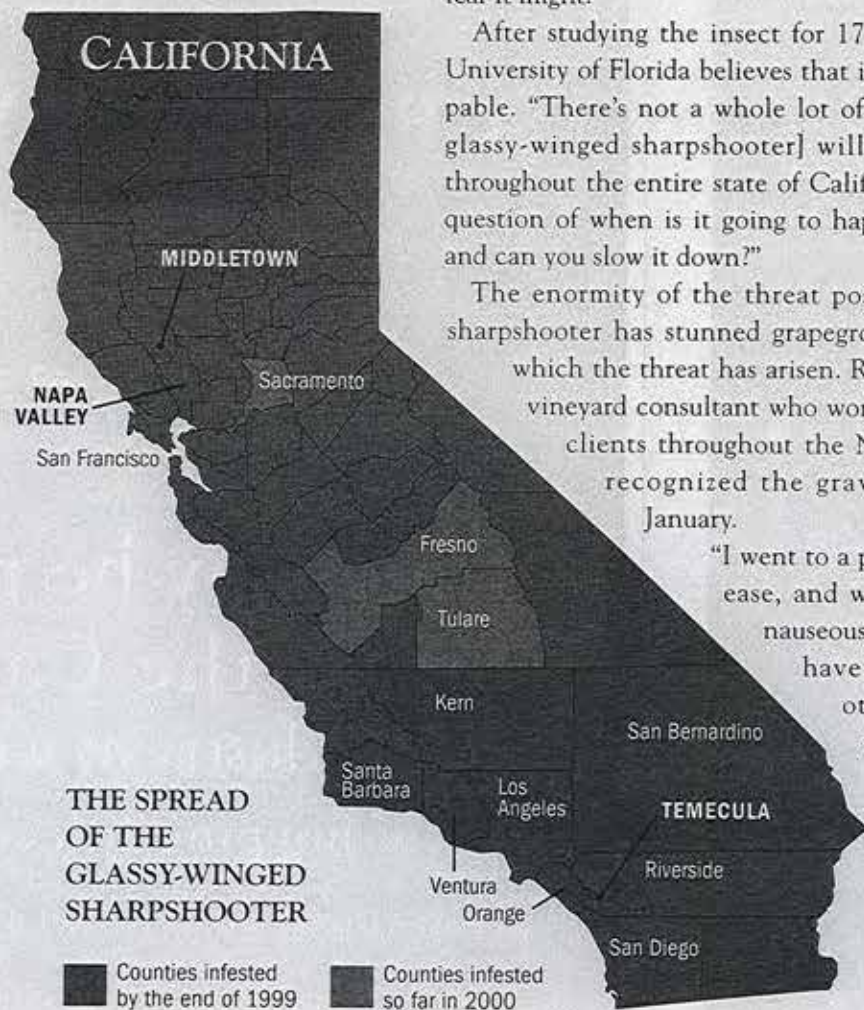
The enormity of the threat posed by the glassy-winged sharpshooter has stunned grapegrowers, as has the speed at which the threat has arisen. Richard Nagaoka, a leading vineyard consultant who works with about three dozen clients throughout the North Coast, says he first recognized the gravity of the situation in January.

"I went to a presentation about the disease, and when I left I was literally nauseous," he says. "I wondered if I have to start training for another career at 56. People won't pay me to help them farm barren fields."

Andy Beckstoffer is one of the most influential and knowledgeable grapegrowers in the North Coast region. He owns 3,000 acres of vineyards, including more than 1,000 acres

in Napa Valley. He considers Pierce's disease a huge threat that demands every effort and resource the industry can muster. One of the greatest dangers he foresees is the political opposition that could erupt in local communities if pesticides are applied on a large scale to control the glassy-winged sharpshooter.

"This is not just another little disease. This is big-time," Beckstoffer says. "To think that anyone will let a national trea-



OPPOSITE: CLAY MCLACHLAN

sure go down is unbelievable. We won't let it happen. No one's going to want to be responsible for this. It just won't happen."

California is no stranger to fatal vine-maladies. In the last 15 years, the phylloxera root louse has cost the wine industry more than \$1 billion. But unlike Pierce's disease, there's a lasting (though expensive) solution to phylloxera: replanting with vines that have been grafted onto resistant rootstock.

However, replanting is not a feasible option once a vineyard is infested by the glassy-winged sharpshooter and infected with Pierce's disease. Young vines are especially susceptible, dying before producing a crop.

*Xylella fastidiosa*, the bacterium that causes Pierce's disease, kills grapevines by thriving in the xylem, the pipelike vascular system that transports water within the vine. In about three years, the bacteria reach such concentrated levels that they clog the xylem and kill the vine. The disease is named for Newton Pierce, a USDA plant pathologist who studied the scourge during its first major California outbreak, in the 1880s. That episode wiped out a thriving grapegrowing district in Anaheim, destroying 40,000 acres of vineyards. Strains of the bacteria also wreak havoc on other crops, such as pit fruits, citrus and almonds, to name just a few.

Napa Valley already has serious Pierce's disease problems caused by the blue-green sharpshooter. About 17 percent of its vineyard acreage has been affected, resulting in \$40 million in damage-related costs over the last five years. If the more powerful glassy-winged sharpshooter becomes established in the area, the disease could run rampant.

"There's so much of the bacteria in riparian areas of Napa that the introduction of the glassy-winged sharpshooter would be devastating," says Bruce Kirkpatrick, a plant pathologist at the University of California at Davis, the state's leading viticultural research institution. "It could potentially wipe out the entire industry."

Napa growers need only look south to see what the future may hold. In Riverside County, about halfway between San Diego and Los Angeles, lies what has been Southern California's biggest and most successful winemaking district, Temecula.

Vineyards and citrus groves have long made this sunny area a popular tourist-destination. Callaway, the area's largest winery, receives more than 120,000 visitors a year, and the Temecula wine industry generates more than \$100 million for the local economy, according to local officials.

Temecula's future as a winegrowing region now hangs in the balance. So far, the glassy-winged sharpshooter has led to the death of about 500 of the region's 2,500 acres of vines

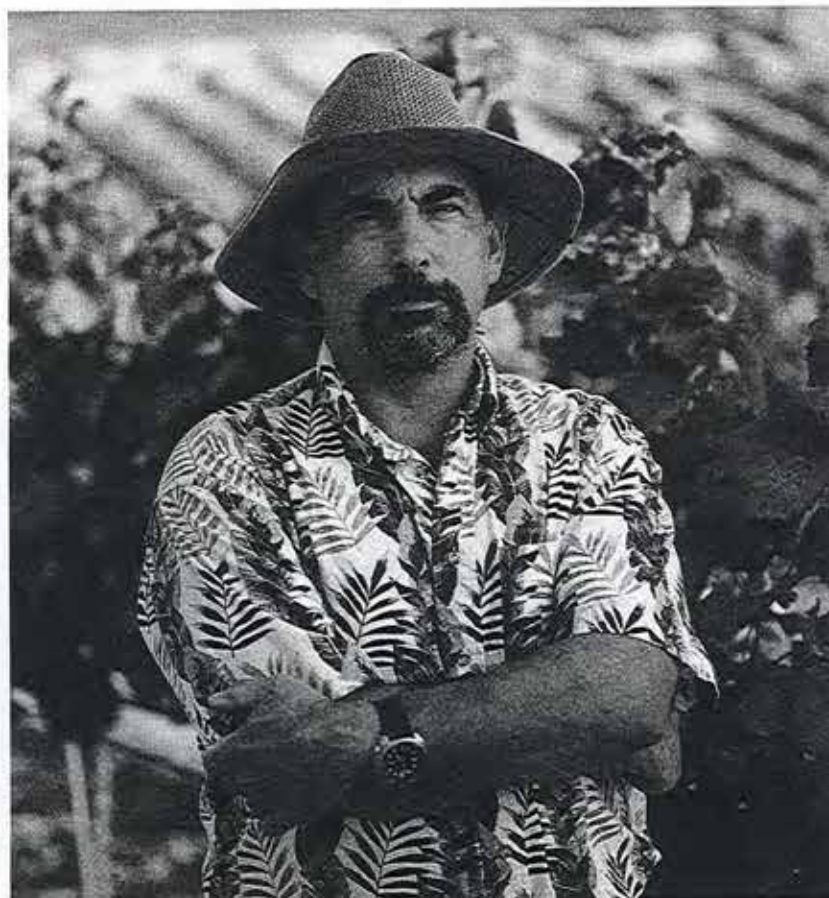
in just three years. By the end of this year's harvest, it looks as if at least another 500 acres will have succumbed to Pierce's disease.

"If we can't abate this, there won't be anything left in three or four years," says University of California at Riverside entomologist Nick Toscano, who has organized pesticide treatments to kill the insect. "It's a numbers game, and it's like putting a Band-Aid on an amputee. This is just a short-term, stopgap measure with the materials we have, but we don't know if we're doing any good."

Although pesticides seem to have reduced this year's population of glassy-winged sharpshooters, it's too early to know if the spread of the disease has slowed.

In the meantime, Temecula is the first place in California where Pierce's disease is killing vines at an exponential, rather than a linear, rate. In other words, what previously was a painful condition now might be a terminal one. "I've studied plant diseases spread by insects throughout my career, and if I were to describe a worst-case scenario, it would be close to what we're seeing," says entomologist Matthew Blua of UC Riverside.

In 1997, experts verified that Temecula's vines were infected with Pierce's disease and that the vineyards were infested with the glassy-winged sharpshooter. The next year, there were hot spots scattered around the area, and by last year, the disease was rampant, with some sites more than 90 percent infected.



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The current tally of the costs of dead vines and lost revenue is about \$12 million. Efforts to slow the spread of the glassy-winged sharpshooter with pesticides could prove worthwhile, but some fear that the insect might be too well-entrenched for even chemicals to have any significant effect.

Callaway doesn't see much reason for hope. So far, 120 of its 720 acres in Temecula have been destroyed, and the winery has no plans to replant that acreage. Instead, company officials have decided to rely on grapes from Santa Barbara, San Luis Obispo and Monterey counties to make the majority of Callaway's wines.

"At this point, anybody who's replanting obviously doesn't have all the facts," says George Rose, director of communications for Callaway. "I hate to use the word 'pointless,' but at this stage there's no reason to replant until they find a cure."

Temecula grapegrowers and vintners worry that they have yet to see the worst, because symptoms of Pierce's disease don't appear until a year after infection. Many of the region's apparently healthy vines could already be dying.

Earlier this year, state officials had hoped to confine the insect to eight counties in Southern California. Over the spring and summer, that proved to be wishful thinking, as infestations were confirmed on hundreds of residential and commercial properties in Fresno, Sacramento and Tulare counties in the vast Central Valley, which is home to hundreds of thousands of acres of grapevines used for the production of wine, table grapes and raisins.

It's not yet certain how far the glassy-winged sharpshooter has spread, as rigorous statewide detection efforts began only this year. State agricultural officials acknowledge that they're still playing catch-up. Some winemakers hope to hamper the spread of the disease by clearing their land of plants that host the glassy-winged sharpshooter. These efforts might prove practically impossible, however, because the insect can feed on 80 percent to 90 percent of all California vegetation. The bug is especially fond of the ornamental plants that are grown throughout Southern California, shipped north and then purchased by landscapers and homeowners.

Under the supervision of county inspectors, nurseries are responsible for ensuring that outgoing shipments are insect-free. But it's a herculean task. In the first six months of this year, more than 15,000 shipments traveled from infested southern counties to destinations in the north. A single shipment can include thousands of plants, with tens of thousands of stems and leaves—any of which could potentially harbor glassy-winged sharpshooter adults, nymphs or eggs.

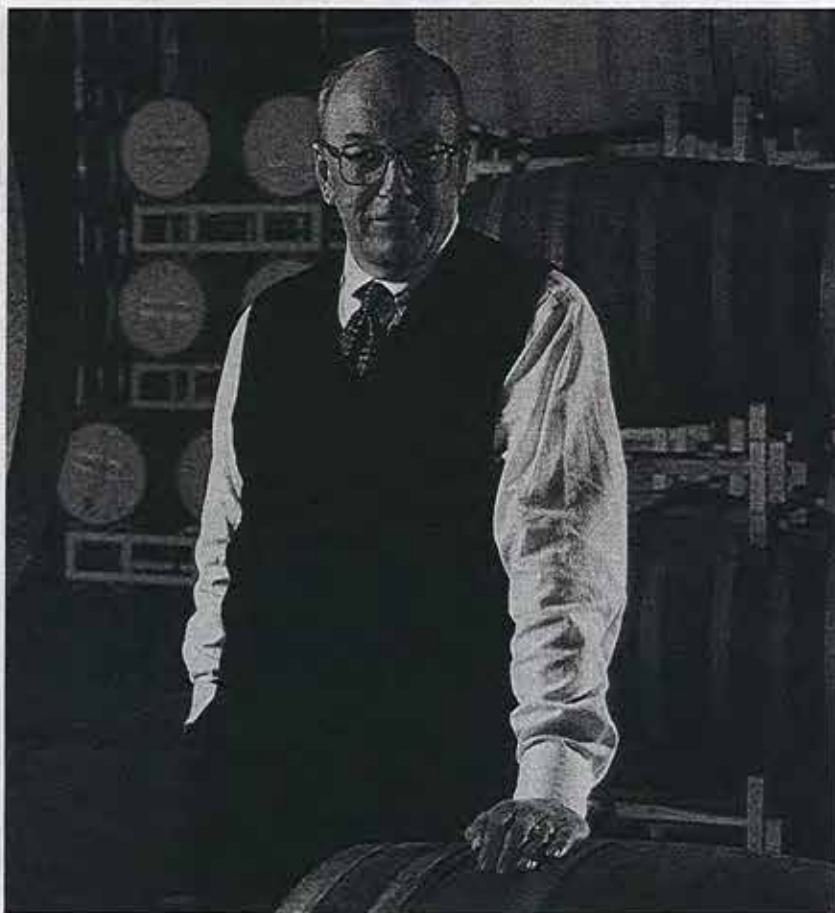
Despite their diligence, inspectors and nurseries can't catch

everything, and contaminated plants have slipped through. Since spring, Napa County agricultural inspectors have discovered 10 shipments contaminated with old egg casings and three that contained viable eggs. Sonoma has identified four infected shipments, of which two had viable eggs.

Bob Wynn, interim statewide coordinator for the glassy-winged sharpshooter/Pierce's disease control program, recognizes that no quarantine or inspection program can be 100 percent effective. "With the present tools available, this pest will never be eradicated from the state," he says. "What we're hoping is that incipient infestations will be eradicated."

The wine industry in Napa Valley contributes about \$4 billion to the U.S. economy every year, according to the Napa Valley Vintners Association, so it's no surprise that some people believe the government should pursue any means necessary—such as an outright quarantine on the transport of plants and grapes from infested counties—to preserve the industry. "It's like shipping dynamite from Croatia to Serbia and expecting nothing to happen," says Michael Havens, owner of Havens Winery in Carneros.

State agricultural officials are reluctant to enact quarantines partly because they could effectively shut down the \$5 billion nursery industry. Moreover, quarantines could turn out to be counterproductive. Enacting a ban would be far easier than



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—LEWIS PLATT, CEO, KENDALL-JACKSON WINERY,  
on the spread of the glassy-winged sharpshooter

enforcing it, as uninspected nursery stock could easily be smuggled into uninfected counties.

One advisory group in Napa shelved plans to call for a quarantine in July due to similar fears. The group decided that "it would be such a threat to local landscapers that it could force them to take drastic action, such as surreptitiously receiving uninspected materials," says Napa County agricultural official Ed Weber.

California winemakers now know what's at stake. They know that time might be running out, but they realize there's relatively little they can do. "Of course we're frightened to death, but it's not as if you can stand on the porch with a shotgun," says Don Weaver, director of Harlan Estate in Napa Valley.

Along with detection and inspection efforts, chemical treatments currently offer the best hope of controlling the insect. After the discovery of new infestations in the Central Valley, more than 1,000 properties were sprayed with pesticide. In September, a state advisory panel will make further recommendations after assessing the results of these spraying programs.

Widespread use of pesticides could mean the end of sustainable organic farming in infested regions. Already, some residents in Sonoma County are up in arms over the possibility of wholesale spraying. In July, many of the 300 or so who attended a public

meeting in the western Sonoma town of Occidental vowed resistance to plans by county officials to spray if the glassy-winged sharpshooter arrives.

Pesticides aside, the scientists whose research might determine the fate of the California wine industry don't foresee any near-term solutions to either problem—the insect or the disease. "We don't know what to do," says Florida researcher Mizell. "We don't know enough about the biology, the epidemiology, the etiology—whatever -ology you want to talk about, we don't know enough."

Researchers emphasize that neutralizing the disease itself, rather than just this specific pest, is the ultimate goal. Every year, exotic insects enter California. If Pierce's disease remains viable, it's possible that other creatures could begin to transmit the bacteria.

Dozens of researchers are at work, backed by public and industry funding. Brazilian scientists have completed a genome map of a different strain of *Xylella fastidiosa*. But geneticists emphasize that simply having a map is a far cry from understanding the map and being able to exploit that knowledge.

There's also some potential for biocontrol techniques. State officials hope that predatory wasps that attack the eggs of the glassy-winged sharpshooter can be used to hinder current and future proliferation.

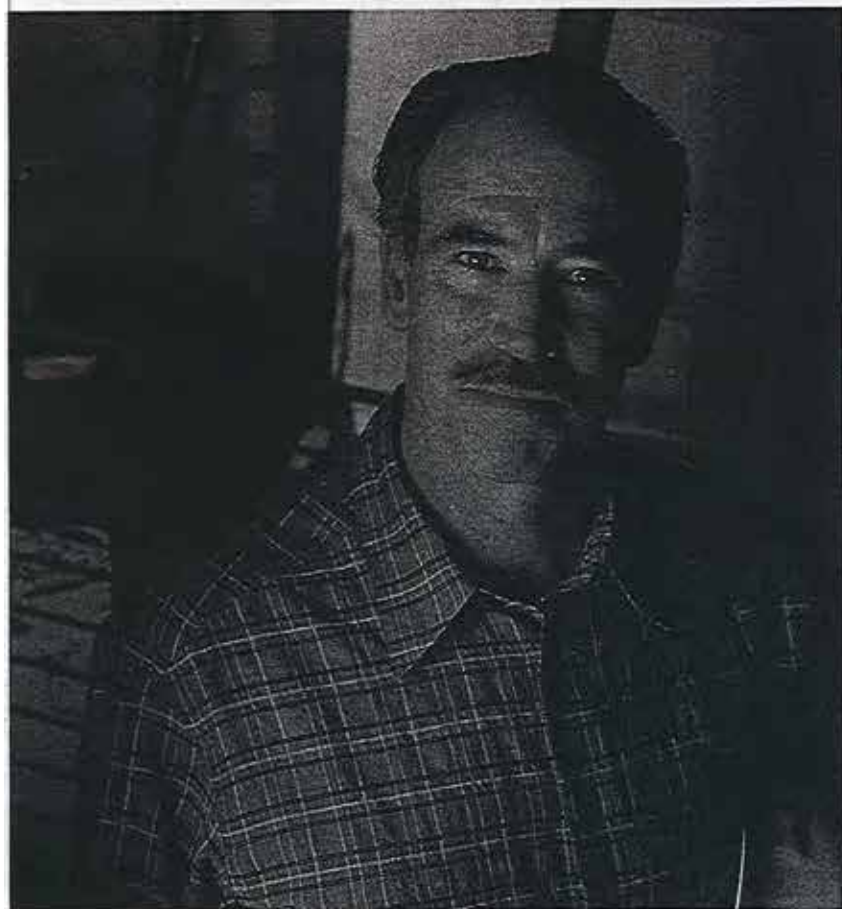
The ultimate answer, though, may be genetically engineered vines. It might be a matter of 10 years' work to create resistance—and that's just the beginning. "No one's done this before," says Andrew Walker, the UC Davis viticulturist who's leading one project. "But whether we can make resistant material that's exactly the same quality as [unresistant] Cabernet Sauvignon is the big question, and I don't think it's been answered yet."

Even if it's possible, the work could take decades, Walker says. And this project won't help vines that are already in the ground.

Ironically enough, the biggest cause for hope is that infested nursery stock may have been shipped all over the state for years, perhaps nearly a decade; but the glassy-winged sharpshooter is not yet established in the north coastal appellations. Perhaps conditions there are not ideal for the insect, and eradication and inspection efforts will suffice.

"Is it inevitable? I don't know," says Lewis Platt, CEO of Kendall-Jackson winery in Sonoma County. "But let's assume that it is. I think if all of us work to minimize the threat and hold it off as long as possible, we'll have better and better ways to deal with it if and when it does take hold."

Experts emphasize that much remains to be learned about the insect and the disease. And even if worst-case scenarios are correct and the glassy-winged sharpshooter spreads across the state, newly established insect populations could take years to reach devastating levels.



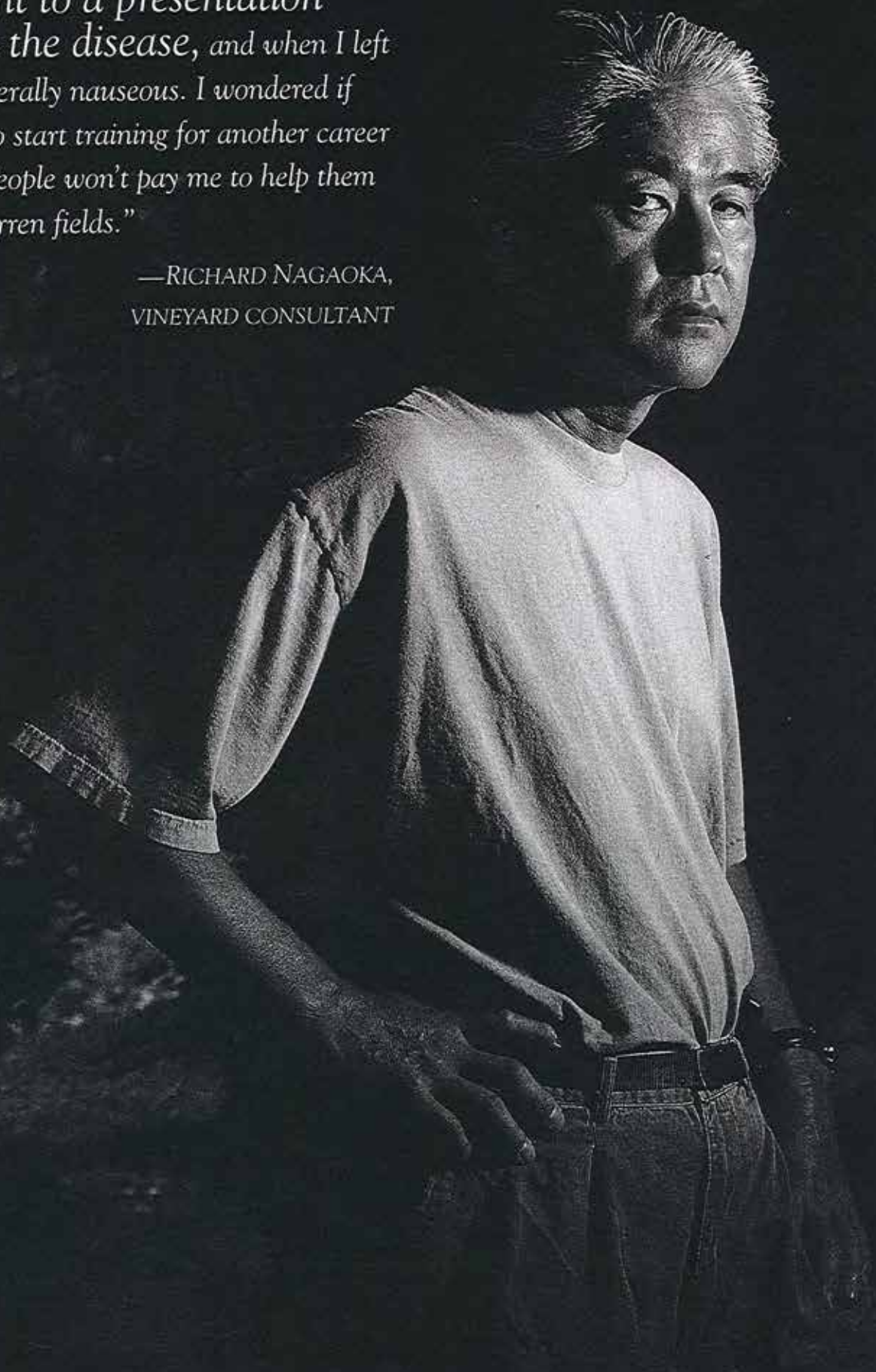
KENT HANSON

*"The investment community is concerned about what they read. They're saying, 'There's a potential risk here, and we're not going to suggest investing in this industry until this risk goes away.' And that then has a direct impact in a negative way on the stock prices."*

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"I'm more encouraged than I've been for a long time," says Sandy Purcell, a UC Berkeley entomologist who's studied Pierce's disease for 30 years. "I think there's a significant chance that [the insect] won't spread to the North Coast in damaging numbers." Despite his newfound optimism, Purcell puts that chance at no better than one in three.

With odds like that, it's no wonder that fear is growing among grapegrowers and vintners throughout the state. "I was having a conversation with some growers," says Napa consultant Nagaoka, "and the question came up if, given the cost, we'd plant a vineyard now in Napa County. We all had to suck in our breath and think about that."

Yet new vineyards continue to spread across Napa, where prime parcels of unplanted land can fetch up to \$150,000 an acre. It's worth wondering, though, what would happen to real estate prices, credit lines or valuations of public companies the day an infestation surfaces near a nursery in the city of Napa or in a vineyard along the Rutherford Bench.

Some of California's biggest wineries are already feeling the economic repercussions of Pierce's disease. Public companies such as Beringer and Robert Mondavi Corp. in Napa Valley have faced increased scrutiny from the financial community, according to Mondavi president Michael Mondavi. In early August, the investment house of Salomon Smith Barney lowered its short-term price targets for both Mondavi and Beringer be-

cause of the threat, though it did not lower its long-term outlook for positive earnings and growth at both companies.

Mondavi says the concerns of the investors have been fanned by what he calls the sensationalistic tone of some of the press coverage of Pierce's disease and the glassy-winged sharpshooter. "The investment community is concerned about what they read, and they're saying, 'There's a potential risk here, and we're not going to suggest investing in this industry until this risk goes away,'" Mondavi says. "And that then has a direct impact in a negative way on the stock prices."

Mondavi considers Pierce's disease to be a serious threat if left unchecked, but he's confident that a concerted effort by the wine industry, government and academia will be able to control it. "The thing I'd like to see happen is for one of these professors to announce that they had found a vaccine that could be fed to the vines that would protect them from the bacterium," he says. "That will probably happen in a period of time."

West of St. Helena, in the heart of Napa Valley, the road up Spring Mountain twists and turns toward the property of winemaker Philip Togni. It's easy to miss the steel gate, nestled in the lush vegetation that surrounds his 10-acre vineyard. But the blue-green sharpshooter, the less formidable pest indigenous to Napa, hasn't had trouble finding these vines. Togni, who planted the site in 1981, has already seen enough of Pierce's disease after it killed 3 acres of his Sauvignon Blanc during the mid-1990s and half an acre of Cabernet Sauvignon per year from 1995 to 1997.

In 1994 he sprayed pesticides and removed surrounding vegetation that might attract the insect. He also tried to outrun the pest by shifting his plantings. "We planted in one area thinking that we escaped from the insect, and we went right into its jaws," says Togni. "We got five boxes [of grapes] out of 35 vines—about 3 pounds per vine. And then they were all dead. Bingo. Just like that."

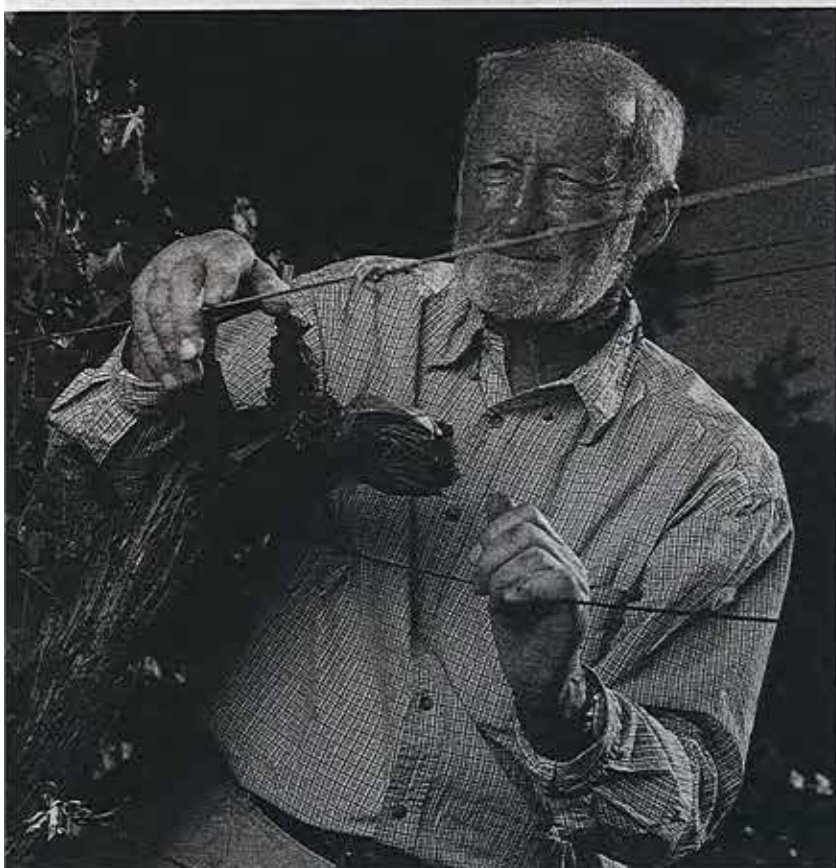
No one is sure why, but few of Togni's vines have died in the last few years. Still, he's seen a snapshot of what might be California's future.

Togni is a lot like many of Napa's better producers. He has no problem selling every bottle he makes. And he doesn't make much—usually less than 2,000 cases per year. An incurable disease transmitted by an unstoppable insect would make quick work of a 10-acre vineyard.

He knows that the clock is ticking. "It doesn't matter how much money we throw at this thing, there aren't going to be any instant results," he says. "It takes time. There hasn't been enough research for all these 120 years. And now we're going to pay the price."

What price?

"We're going to lose a lot of vineyards." □



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CLAY MCLACHLAN