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Homeowners can help keep the blaze at bay even as wildfire rages

After serious wildfires, it can seem like flames leapfrogged through neighborhoods, leaving some homes unscathed alongside others that have been reduced to rubble. University of California scientists have found that this familiar sight is not entirely random. 

"You can do a lot to protect your house from a wildfire," said Stephen Quarles, the UC Cooperative Extension wood durability advisor.

With the right information, some advance planning and maintenance, homeowners can increase the chances their houses will be left standing after a wildfire.

"During a wildfire, hot embers can rain down on the neighborhood for hours before the relatively short time – sometimes no more than a few minutes – it takes for the blaze to blow by the home," Quarles said. "From years of observing the aftermath of fires and testing fire-resistant building materials, we have developed a much better understanding about what happens."

New construction will be required to have increased fire safety measures built in beginning in 2008. New guidelines for construction in areas under state jurisdiction go into effect on Jan. 1; they go into effect in fire hazard zones under local jurisdiction on July 1.

These laws govern only new construction, and presumably many of the homes that will be rebuilt after the devastating Southern California fires of fall 2007 will include the provisions, but Quarles said owners of existing homes may also wish to consider making changes to improve their homes' resistance to wildfire.

Six priority areas for protecting existing homes

Quarles has identified six priority areas for making changes to existing homes in fire hazard zones. He suggests homeowners start with the roof, the most vulnerable part of the house in a fire, and then continue in order with vents, vegetation, windows, decking and siding.

Ignition-resistant "Class A" and non-combustible roofs – such as concrete tile and asphalt composition shingles – have become the norm in California due to laws passed in the late 1990s that required all new homes and all roof replacements in very high fire hazard severity zones to be Class A. Nevertheless, there are still many older homes that do not have Class A roofs.

"The importance of the roof covering cannot be overstated," Quarles said. "If you haven't already, you should make an upgrade to a Class A roof your first priority."

However, he says, don't stop there. Because the roof and siding are dominant features on houses, many homeowners get a false sense of security when they install non-combustible roofs and siding.

"When I've looked at post-fire home losses, the thing that strikes me is the vast amount of non-combustible material on the ground," Quarles said. "That clearly illustrates that the fire-protection efforts some people may not think are as important as roofs and siding really are quite important. There's much more to do."

Keep fire from entering the home through vents

The second item on Quarles' priority list is vents. Vents for crawl spaces under homes or for attics are required by most building codes to prevent a build up of moisture, which can lead to mold growth and decay in building materials.

"We know that vents offer an easy entry point for burning embers and flames," Quarles said. "Embers that slip through attic vents can ignite debris and items stored there, and subsequently construction materials, setting the home ablaze from within."

Most building codes require vents be covered with a minimum ¼-inch mesh to minimize plugging and reduction in air movement.

“Quarter-inch mesh cannot stop embers and flames during wildfires,” Quarles said. “This is an example of conflict in code preferences between building and fire officials. Smaller mesh screens would do a better job of keeping out fire and embers, but these same screens plug up more easily.”

The importance of vents in wildfire resistance is leading to such innovations as the development of vents specially designed to limit ember intrusion while still allowing sufficient air flow for ventilation and construction designs and procedures that permit unvented attics to avoid moisture-related problems.

Quarles suggests homeowners frequently check their vents to make sure there is no buildup of debris, such as highly combustible dry leaves and pine needles. For added protection, they can make vent covers out of plywood or another solid material that can be quickly installed over vents when wildfire approaches.

Vegetation can work in your favor and against it

Next, look at vegetation, which can be both harmful and helpful in home fire protection. Plants close to the home, under eaves, in inside corners and near windows can be major fire hazards, but trees and shrubs farther away can serve as buffers against radiation, convective heat and flying embers.

“Trees might have a bad reputation because of the potential to spread fire in the crown, but that is seldom a hazard to structures,” Quarles said.

In addition to where plants are located, Quarles suggests careful attention be given to plants’ innate fire resistance. Bushy junipers and cedars, for example, can be a poor choice. Look for leggy plants with succulent leaves to landscape close to the house.

The smaller the plants the better, Quarles said, especially near windows and in the parts of the home designed to give the house architectural interest, such as inside corners, where heat builds up much faster than on open, flat sides. He stresses that plants should always be well maintained.

“Any plants near a house should be pruned, regularly watered and kept free of dead material within the branches and on the ground,” Quarles said.

Attention to landscape and native vegetation is also an important component in creating defensible space around the home. Experts suggest the area 30 to 50 feet all around the home contain little or no combustible vegetation, no dead vegetation or flammable debris.

Windows are a vulnerable part of the home in fire hazard zones

The next priority should be windows. Research has shown that by far the most important factor in determining the vulnerability of windows in a wildfire is the glass, not the frame.

“It’s a good idea to install dual-pane windows with tempered glass,” Quarles said. “With dual pane windows, the outer pane protects the inner pane. The inner pane heats up more slowly and uniformly, and therefore may not break even though the outer pane does.”

Tempered glass is much stronger than regular glass, so it provides more protection from breaking. The new chapter in the building code going into effect in 2008 requires at least one-pane to be tempered glass. Since the type of frame doesn’t make much difference in a fire, it can be selected based on cost, aesthetics, energy efficiency or other factors.

As is the case for vents, homeowners can fabricate window covers out of $\frac{3}{4}$ -inch plywood or another fire-resistant material. Cut them to size and mark them clearly so they can be installed quickly over windows before evacuating the home when a fire breaks out.

Decks and siding round out the top six priority areas for wildfire-resistance

Decks also deserve attention for reducing the fire hazards. An ignited deck endangers many portions of a structure and is often adjacent to large windows or sliding glass doors. The heat from a burning deck can cause the glass to break and permit the fire to enter the house, which means likely destruction.

“In general, the thicker the deck boards the better. Boards that are an inch thick or less release heat much faster and are a higher hazard,” Quarles said. “Be mindful of the gaps between the boards and between the house and the decking. Combustible debris can build up in the gaps and corners, and flying embers can get lodged there and begin smoldering.”

Quarles acknowledges that replacing deck boards can be expensive, but, he says, “It may be one of the best investments you can make.”

For replacement, consider any material – plastic, plastic composite lumber, fire-retardant treated lumber for exterior use, or lumber – that passes the state test procedure approved by the California State Fire Marshal’s office.

“There are a lot of composite decking products on the market. In fire tests conducted a few years ago, some resisted fire as well as solid wood, but none were better,” Quarles said.

He said he expects new decking products to come on the market when the 2008 building code goes into effect. Currently, decking materials that meet the specifications of the new code are not commercially available, though they will be soon.

The sixth priority is siding. In research trials, good quality sheathing – which is installed underneath the siding – was a key to protecting the home’s studs. A wide array of non-combustible siding can be installed over the sheathing – such as stucco or fiber-cement siding. Combustible siding – such as wood panels and clapboard – should be carefully inspected annually for gaps, making sure that they are filled with a high-quality caulk to prevent hot embers from taking up residence and beginning to burn.

Even beyond these six priority areas, there are other areas where measures may be taken to keep the house safer in a fire, such as fences, garages and gutters. For detailed information from the University of California Cooperative Extension on the fire protection priority areas and many other issues, see Quarles’ Homeowners Wildfire Mitigation Guide online at <http://groups.ucanr.org/HWMG/index.cfm>. See also the UC Center for Fire Research and Outreach at <http://firecenter.berkeley.edu/>, and an interactive Web site with information about actions to take before, during and after fires at <http://www.wildfirezone.org/>

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Visuals: Quarles oversees a demonstration home in Richmond that shows various building materials, design features and landscape vegetation that can minimize fire danger.



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