Landscaping to Reduce Fire Risk

by Annie Hermansen-Báez

You probably weren't thinking about wildfire when you landscaped your yard. If you live in a fire-prone area, you might want to think again. The good news is that SRS research can help you plant in a way to reduce the risk of fire reaching your home.

When researchers at the **SRS Southern Center for Wildland-Urban Interface Research and Information** asked fire specialists across the South about their information needs, many responded that they needed to know more about the flammability of the plants and mulches used in southern landscaping. This kind of information is particularly important where homes are close to or within fire-prone natural areas. Although all plants will burn with the right conditions, some species are less flammable than others, making them more desirable for firewise landscaping.

Mulches are another factor that can increase the risk of fire reaching your home. "To make your home safe from fire doesn't mean no landscaping," says **Alan Long**, University of Florida (UF) professor and SRS collaborator. "It means choosing the proper plants and mulches."

The Right List of Plants

Homeowners interested in landscaping to reduce the risk of fire often look for a list of landscape plants with low flammability to guide their selections. The few lists available are usually based on observation or anecdotal evidence, rather than on research. They may include related species found on firewise plant lists from other parts of the country; even though related, plant species from other regions do not necessarily have the same flammability as species found in the South. There is a real need for accurate lists.

"Extension personnel and fire professionals that I contacted were looking for lists of firewise plants to give to wildland-urban interface residents they're working with," says **Anna Behm Mosozera**, UF researcher on the firewise landscape project. "They saw firewise lists as a key component in helping residents make informed decisions about landscaping in fire-prone areas."

To address this need, SRS researcher **Wayne Zipperer** and collaborators at UF and the National Institute of Standards and Technology (NIST) are conducting a series of studies to evaluate plant flammability. Behm Mosozera led a preliminary study on the flammability of shrubs found in the understory of the pine flatwoods and hardwood hammock ecosystems of the southern Coastal Plain, and came up with four measures that could be used to rank plant flammability: ignitability, sustainability, combustibility, and consumability. The research focused on shrubs because previous postfire assessment studies indicated that the presence of shrubs was a key contributing factor to whether a home was damaged or destroyed by a wildfire.

Based on results from this study, the researchers developed a flammability key that urban foresters, extension agents, and others can use to create firewise plant lists for homeowners in the areas where they work. The step-by-step ranking method is based on easy-to-identify characteristics such as type of plant (tree, palm, shrub, or vine); distance between the ground and branches; texture of the bark or leaves (coarse, medium, or fine); denseness of the plant; and other factors. After completing all of the steps, the

Landscaping—either by using horizontal separation or by using plants with low flammability—can reduce the risk of fire to houses. *(photo by Larry Kohrnak, University of Florida)*

resource professional can identify plants as "not firewise," "at-risk firewise," "moderately firewise," or "firewise." Behm Mosozera cautions that though this method is a great way to make your own local plant list, it should also be compared to other sources of information such as local fire experts.

In another study, the same researchers looked specifically at the flammability of 34 noninvasive shrub species commonly used in landscaping across the South. Fire specialists in many Southern States helped determine the shrubs to be tested by filling out a survey. Once the shrub species were selected, comprehensive burn trials were conducted under controlled conditions at the NIST Building and Fire Research Laboratory in Gaithersburg, MD. Flammability measurements were taken, such as: time until ignition, heat release rate, and maximum flame height. From these studies a flammability ranking of the 34 shrubs was generated for use by fire professionals in the South. This information also helped to validate and refine the flammability key. The research team hopes to expand this study to include more species in the future.

Safe Mulching

Another study is investigating the flammability of four mulches commonly used around homes—pine straw, shredded cypress, and small- and large-chunk pine bark nugget. Many people use these

(continued on page 30)

Flammability study on pine-straw mulch.
(photo by Wayne Zipperer, USDA Forest Service)

The Four Components of Plant Flammability

In the firewise landscaping context, flammability refers to the ability of a plant to ignite and transfer heat and/or flames to surrounding plants or structures. Plants are flammable for different reasons; some plants ignite quickly, but also burn off quickly. Other plants are not easy to ignite, but can burn for a long time once ignited. Flammability is made up of four components:

- **Ignitability**—the length of time until a plant starts burning when exposed to a flame or other heat source
- **Combustibility**—how rapidly or intensely a plant burns: the rate of spread and rate of heat (or energy) given off from a burning plant
- **Sustainability**—the length of time the plant will sustain a fire
- **Consumability**—how completely the plant burns, or the quantity of the plant that is consumed during a fire

What Do We Mean by "Firewise" Landscaping?

Generally speaking, to be "firewise" is be adequately prepared for the possibility of wildfire. In this sense, firewise consists of many components, including: community design, escape routes and plans, construction materials, and landscaping. Firewise landscaping involves modifying the landscape around the home to create a "defensible space." Within this space, plantings should be separated both vertically and horizontally to break up vegetation and reduce the amount of fuel available for fire spread. Creating defensible space also improves access for firefighters and their equipment. In addition, it is recommended that landscape plants with low- or moderate-flammability characteristics be used in the defensible space.

For more information:
www.firewise.org

Landscaping to Reduce Fire Risk

(continued from page 29)

mulches directly up to and in contact with their homes, yet little is known about their flammability. "The information we are collecting will help homeowners determine the best mulch type to have around their homes in the event of fire threat," says **Brian Hinton**, UF researcher who is working on the project with SRS researcher Zipperer.

In initial tests burning pine straw and large-chunk pine bark nuggets, temperatures reached 700 to 800 degrees at 4 inches above the mulches. The smaller pine bark chunks reached 400 to 500 degrees, and the shredded cypress reached 300 to 400 degrees. Ignition temperatures for most fuels are usually in the range of 600 degrees. Pine straw tended to flare up immediately, while both sizes of pine bark nuggets tended to smolder and continue to generate heat over a longer period of time.

The ability of mulches to hold moisture was found to be a critical factor influencing their flammability. The study is looking at how fire spreads across mulch and from mulch to plants, and how the arrangement of plants affects how fire spreads to homes. Zipperer cautions that if you live in a fire-prone area, mulches should not be placed immediately adjacent to structures, regardless of mulch type. Final results from this study will be available next year.

Information about plant and mulch flammability will help homeowners to plan their landscapes to reduce fire risk and still retain many of the other landscaping benefits they desire, such as creation of wildlife habitat, conservation of energy and water, and aesthetics. This information will also help improve predictive fire models—and ultimately, develop more firewise communities.

For more information:
Annie Hermansen-Báez at
352–376–3271 or ahermansen@fs.fed.us

To access the flammability key:

www.interfacesouth.org/products/fact_sheets/Preparing_Firewise_Plant_List.pdf or

www.interfacesouth.org/products/flammability_key.html

For more information about these flammability studies and other related projects:

www.interfacesouth.org/products/research.html

(photo by Larry Kohrnak, University of Florida)