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As Tennessee's population continues to grow, more people are building homes in rural forested areas. Each year Tennessee experiences approximately 2,000 wild (forest) fires. With the influx of new homeowners in and around forest land, the chances of wildfires damaging home structures increase. Improper landscaping around homes increases the likelihood of fire damage, while also hindering the activities of firefighters.

The Goal of Firewise

Firewise is a program administered by state forestry and fire agencies with a primary goal of protecting homes and homeowners from property damage associated with

wildfires. Firewise educates homeowners and communities about landscaping techniques that will increase the defensible space (or buffer zone) around homes. Defensible space essentially "breaks the chain" of combustible fuel between homes and natural vegetation; slowing or eliminating the fire spread, and allowing firefighters a place to operate.

Developing defensible space around a house or dwelling requires that these objectives be met:

1. Create a non-flammable initial barrier zone adjacent to the house;
2. Establish less flammable vegetation beyond the non-flammable zone; and
3. Increase moisture within the protection zones.



Photo Credit: Robin Bible

An example of Firewise recommended landscaping with non-flammable vegetation near the home.

Creating a Non-flammable Barrier Zone

As ground fires approach a house, flames and embers make contact, causing the structure to catch fire. For best defense, the first 5 feet adjacent to a house should not contain any flammable material. This includes grass/plants/shrubs/trees, as well as decaying material such as leaves, mulch, bark and even firewood. Ideally, the non-flammable barrier zone should be sidewalks, stepping stones, stone walls, and/or rock or gravel. Elimination of flammable material in this zone protects a house from ground flames. However, the zone will not protect buildings from overhead flames or embers originating from taller vegetation, such as trees. A different strategy is needed beyond the non-flammable zone.

Beyond the Non-flammable Zone

To minimize the likelihood of flames or embers either jumping toward or falling onto a house, vegetation should resemble a “stair-stepping” pattern as it proceeds outward from a house (Figures 1 and 2). Within the first “step” (a region from 5–15 feet from the house) should be low-stature landscaping, including raised flower beds, water or rock gardens, stone walkways or patios. This region will continue to break the fuel chain, while still providing visual enjoyment.

In the second “step” ground cover, shrubs and small trees can be established approximately 15 to 30 feet from the house. Vegetation in this region should be of high moisture-holding capacity, with low sap or resin content, and resistant to ignition. Also, vegetation should not be continuous, rather altering in arrangement and separated by non-flammable gaps of stone or other non-flammable material. A list of recommended ground covers, shrubs and trees for use in the second “step” is found in Tables 1, 2 and 3.

The final “step” occurs 30 feet and beyond from the house. Here larger-growing trees can be established and/or maintained. Species of conifers such as pine and fir are not recommended because of the high flammability of needles and bark. Instead, deciduous species such as oaks, poplar, maple, etc. are recommended. The ground directly under and around larger trees should be well-maintained, kept free of brush, debris and flammable dead material. Table 4 gives suggestions for larger trees more suitable for the Firewise defensible space.

Increasing Moisture in Defensible Space

Plants that are firm or turgid due to water uptake are slower to ignite. Homeowners are wise to keep exterior plants healthy by watering frequently, particularly during dry periods when the likelihood of wildfire increases. This is true of grasses, ground covers, shrubs and trees. Even mulch should be kept moist during dry periods. Use just

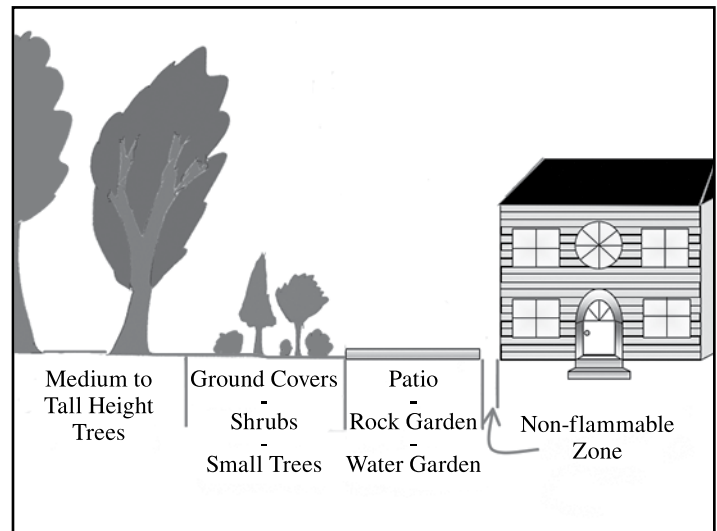


Figure 1. Side View of Firewise Landscaping

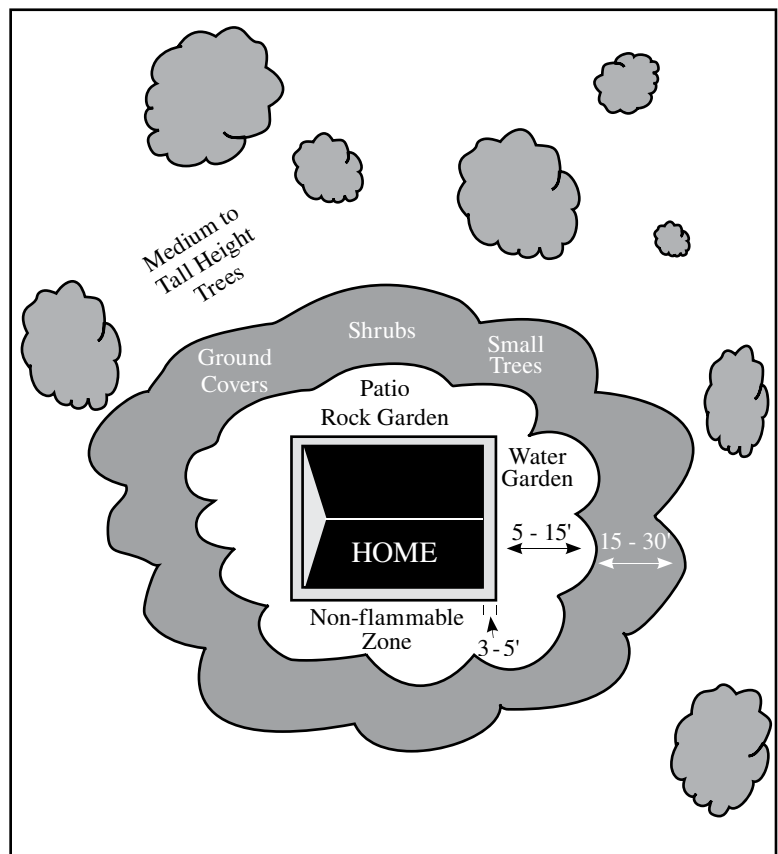


Figure 2. Top View of Firewise Landscaping

enough mulch to keep the weeds suppressed and the soil damp. Excessively deep mulch can cause fire to smolder and complicate suppression efforts. Taller trees in the outer region of the stair-stepped vegetation can provide shade to the remainder of the yard, thereby conserving some moisture around the house.

Table 1. Ground Covers for Firewise Homes

Scientific Name	Common Name	Comments
<i>Ajuga reptans</i>	Ajuga, Bugleweed	Not drought-tolerant. Prefers light shade
<i>Euonymus fortunei</i>	Wintergreen euonymus	Many forms exist, some vines. Best planted in sun. Prone to insect problems
<i>Hypericum calycinum</i>	St. Johnswort	Used in erosion control. Poisonous
<i>Liriope muscari</i>	Bigblue liriope	Semi-tolerant of drought
<i>Liriope spicata</i>	Liriope	Excellent for erosion control, drought and salt- tolerant. Grows under shallow-rooted trees
<i>Ophiopogon japonicum</i>	Monkeygrass	Good for erosion control, drought-tolerant. Best in warmer regions of Tennessee
<i>Opuntia</i> spp.	Prickly pear	Native to arid regions, but very climate-adaptable. Has spiny stems
<i>Pachysandra terminalis</i>	Pachysandra	Not tolerant to foot traffic or full sun conditions
<i>Rhus aromatica</i>	Fragrant sumac	Good for erosion control, tolerates drought
<i>Sarcococca hookerana</i> var. <i>humilis</i>	Sweetbox	Tolerates air pollution
<i>Sedum</i> spp.	Sedum	Drought-tolerant & maintenance-free
<i>Vinca major</i>	Bigleaf periwinkle	Good for erosion control, tolerates drought
<i>Vinca minor</i>	Periwinkle; Vinca	Good for erosion control, finer texture than V. major. Prefers a shaded location



Photo Credit: Wayne Clatterbuck

Plants that retain their leaves all year such as rhododendron (as shown in this photo), laurel, holly, juniper and hemlock generally have highly flammable leaves and should not be planted near structures.

Additional Considerations for Firewise Homes

Homeowners should consider these additional factors when establishing a Firewise landscape:

1. The foundations and support structures for patios should be of concrete, stone or rock;
2. Keep tree branches pruned well away from the ground level;
3. Rake leaves and other debris away from structures (often);
4. Do not allow grasses to reach more than 8 inches in height, even along the perimeter of the property;
5. Stack firewood at least 30 feet from the house;
6. Use nonflammable roofing materials, enclosing decks, soffits and overhangs, and removing debris from roofs and gutters;
7. Store flammable liquids outside the house and at least 30 feet away from structures;
8. Be careful with fire, and notify the local fire department immediately in the event of fire.

Table 2. Deciduous Shrubs for Firewise Homes

Scientific Name	Common Name	Comments
<i>Callicarpa americana</i>	Beautyberry	Prune out rank growth. Showy fruit. Best in warm climates; use introduced species in cold climates
<i>Calycanthus floridus</i>	Sweetshrub; Carolina allspice	Aromatic flowers and stems
<i>Chaenomeles speciosa</i>	Japanese flowering quince	Well-adapted to many conditions. Has spines and is susceptible to leaf diseases
<i>Clethra alnifolia</i>	Summersweet clethra	Well-suited for use in wet soils
<i>Forsythia x intermedia</i>	Border forsythia	Tolerant of urban conditions, pH adaptable.
<i>Hamamelis vernalis</i>	Vernal witchhazel	Tolerates poorly drained soils
<i>Hamamelis virginiana</i>	Common witchhazel	Very adaptable to climatic conditions
<i>Hibiscus syriacus</i>	Rose-of-Sharon	Well-adapted to many conditions
<i>Hydrangea arborescens</i>	Smooth hydrangea	Suckers freely from roots, will cover large areas if not maintained. Needs good drainage
<i>Hydrangea macrophylla</i>	Bigleaf hydrangea	Plant parts are poisonous. Prefers shade and good drainage
<i>Hydrangea paniculata</i>	P.G. hydrangea, panicle hydrangea	Plant parts are poisonous. Prefers sun and good drainage
<i>Hydrangea quercifolia</i>	Oakleaf hydrangea	Plant parts are poisonous. Tolerates shade. Needs good drainage
<i>Hypericum prolificum</i>	St. Johnswort	Excellent plant for dry, heavy soils
<i>Ilex verticillata</i>	Winterberry holly	Tolerates wet soils
<i>Itea virginica</i>	Virginia sweetspire	Tolerates wet soils. Sun or shade
<i>Jasminum nudiflorum</i>	Winter jasmine	Drought-tolerant, used in erosion control. Requires good drainage
<i>Lagerstroemia indica</i>	Crapemyrtle	Tolerant of drought and urban conditions. Select cultivars are more cold-tolerant
<i>Philadelphus coronarius</i>	Sweet mockorange	Adapts to almost any soil condition
<i>Physocarpus opulifolius</i>	Nine-bark	Drought-resistant, pH adaptable. Sun or partial shade
<i>Rhus copallina</i>	Shining sumac	Useful for dry, rocky sites
<i>Rhus glabra</i>	Smooth sumac	Tolerates drought and poor soil conditions
<i>Spirea prunifolia</i>	Bridalwreath spirea	Heavy pruning will destroy this shrub's natural arching habit
<i>Spirea thumbergii</i>	Thunberg spirea	Durable, tolerant of a wide range of conditions
<i>Spirea x bumalda</i>	Bumald spirea	Needs well-drained soil
<i>Vaccinium ashei</i>	Rabbiteye blueberry	Sun or shade. Needs acid, well-drained soil.
<i>Viburnum carlesi</i>	Koreanspice viburnum	Early, fragrant flowers
<i>Viburnum dentatum</i>	Arrowwood viburnum	Tolerates high pH, heavy soils and cold temperatures

Table 3. Small Deciduous Trees for Firewise Homes

Scientific Name	Common Name	Comments
<i>Acer palmatum</i>	Japanese Maple	Cultivars may be upright or weeping
<i>Aesculus parviflora</i>	Bottlebrush buckeye	Sun or shade
<i>Aesculus pavia</i>	Red buckeye	Attracts hummingbirds
<i>Amelanchier arborea</i>	Downy serviceberry	Attracts birds
<i>Asimina triloba</i>	Pawpaw	Host plant for zebra swallowtail, Tennessee's state butterfly
<i>Cercis canadensis</i>	Eastern redbud	Tolerates wide range of conditions
<i>Chionanthus retusus</i>	Chinese fringetree	Tolerant of wide range of soils
<i>Chionanthus virginicus</i>	American fringetree	Tolerant of wide range of soils
<i>Cornus florida</i>	Dogwood (species)	Select disease-resistant cultivars. Needs good drainage
<i>Cornus kousa</i>	Kousa dogwood	Blooms later than native. Disease-resistant
<i>Cornus mas</i>	Cornelian cherry	Blooms in late winter
<i>Amelanchier arborea</i>	Downy serviceberry	Attracts birds
<i>Crataegus</i> spp.	Hawthorn (species)	Select for disease resistance
<i>Koeleruteria paniculata</i>	Golden raintree	Reseeds vigorously
<i>Malus</i> spp.	Flowering crabapple	Select disease-resistant cultivars
<i>Viburnum prunifolium</i>	Blackhaw viburnum	Good for birds

Summary

Even though most landowners prefer to have their home within the forest to benefit from the wooded, pastoral setting and shade from trees, there is a substantial risk from wild-fire and hazard trees. The altered environment (both above and belowground) of trees near home building sites often causes mature trees to decline. These trees usually do not recover and become maintenance problems as they slowly decline. Leaving defensible space with large trees more than 30 feet from the house will decrease the probability of wildfire susceptibility and reduce maintenance of the landscape near the house.

Through proper planning and implementation, homeowners can lessen the likelihood of wildfires damaging their home, while still enjoying living in forested areas. The techniques addressed here are simple yet effective ways of protecting dwellings from fire. For more information on Firewise, see the following Web site: www.state.tn.us/agriculture/forestry.

References

- Barkley, Y., C. Schnepf, and J. Cohen. 2005. Protecting and Landscaping Homes in the Wildland/Urban Interface. Station Bulletin No. 67. Moscow, ID: University of Idaho Extension.
- Dennis, F.C. 1999. Fire-Resistant Landscaping. Pub. No. 6.303. Fort Collins, CO: Colorado State University Cooperative Extension.
- Dennis, F. C. 1999. FireWise Plant Materials. Pub. No. 6.305. Fort Collins, CO: Colorado State University Cooperative Extension.
- Tennessee Department of Agriculture, Forestry Division. 2005. Firewise Landscaping. Nashville, TN.
- Virginia Firewise Landscaping Task Force. 1998. Virginia Firescapes: Firewise Landscaping for Woodland Homes. Pub. No. 430-300. Blacksburg, VA: Virginia Cooperative Extension.

Table 4. Taller Deciduous Trees for Firewise Homes

Scientific Name	Common Name	Comments
<i>Acer</i> spp.	Maple (species)	Select superior forms
<i>Betula nigra</i>	River birch	Prefers rich, moist sites
<i>Carya</i> spp.	Hickory species	Nuts may be litter problem
<i>Catalpa bignonioides</i>	Southern catalpa	Pods and caterpillars may create litter problem. Tolerates wide range of soils
<i>Celtis laevigata</i>	Sugarberry	Attracts birds
<i>Celtis occidentalis</i>	Hackberry	Wide range of soils. Enjoyed by birds
<i>Cladrastis lutea</i>	American Yellowwood	Fragrant bloom
<i>Diospyros virginiana</i>	Common Persimmon	Wide range of growing conditions. Fruit may be messy
<i>Fraxinus</i> spp.	Ash (species)	Fast-growing tolerant of wide range of soils
<i>Ginkgo biloba</i>	Ginkgo	Select male cultivars to avoid smelly fruit
<i>Gymnocladus dioica</i>	Kentucky coffeetree	Drought-tolerant. Picturesque. Fruitless forms available
<i>Liriodendron tulipifera</i>	Yellow-poplar, Tuliptree	Fast-growing. May defoliate prematurely in dry summers
<i>Magnolia</i> spp.	Magnolia	Many species. Tolerant of a wide range of growing conditions
<i>Nyssa sylvatica</i>	Black gum	Tolerant of wide range of soils
<i>Ostrya virginiana</i>	Hornbeam	Sun or shade. Slow-growing.
<i>Oxydendrum arboreum</i>	Sourwood	Requires good drainage, prefers acid soil
<i>Quercus</i> spp.	Oak (species)	Good for wildlife
<i>Sassafras albidum</i>	Sassafras	May sucker and colonize. Great fall color
<i>Salix</i> spp.	Willow (species)	Select for superior forms. Prefers moist site
<i>Ulmus parvifolia</i>	Lacebark elm	Resistant to disease. Select superior forms
Fire-resistant but not highly received for landscape use		
<i>Acer negundo</i>	Boxelder	Reseeds vigorously
<i>Juglans nigra</i>	Black walnut	Nuts are litter problem. Allelopathic
<i>Liquidambar styraciflua</i>	Sweetgum	Prickly fruiting balls objectionable in the landscape
<i>Prunus serotina</i>	Black Cherry	Reseeds vigorously, disease-prone
<i>Ulmus</i> spp.	Elm (species)	Native species susceptible to disease

SP685-13.5M-10/06 R12-4910-065-011-07 07-0075

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Printing for this publication was funded by the USDA Forest Service through a grant with the Tennessee Department of Agriculture, Division of Forestry. The Trees for Tennessee Landscapes series is sponsored by the Tennessee Urban Forestry Council.

