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Landscape Plant Selection For Reduced Fertilizer And Pesticide Use

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Overuse or misuse of fertilizers and pesticides in the home landscape can be traced to selection of the wrong plant for the planting site.

Plants improperly located, incorrectly planted, or neglected after planting are more susceptible to environmental stress caused by drought, poor soil drainage, soil compaction, extreme air or soil temperatures, low or high light levels, and a number of other factors. Such plants are more susceptible to invasion by a wide array of pests than plants that are properly planted. Pesticide applications are, therefore, necessary in greater amounts or with more frequent applications for these weakened trees, shrubs, or turf grasses to be maintained. In addition, many plant species are susceptible to particular pests regardless of their location, making them difficult to grow or maintain in our region without extensive use of pesticides.

Numerous physiological disorders can exhibit symptoms like nutrient deficiencies or can actually induce nutritional imbalances in the plant. Soil conditions, such as pH, particle size, or moisture holding capacity, can affect nutrient uptake differently for various plants. Physiological disorders or soil deficiencies may also cause a need for increased fertilizer or pesticide use.

As a means of reducing pesticides and fertilizer inputs, consider the following factors when selecting plants for the new landscape or maintaining plants in the existing landscape.

Plant Hardiness

Plants have varying capacities to tolerate cold or heat. Cold tolerance is of most concern. The state of Alabama spans 2 major plant hardiness zones, Zone 7 (from the central part of the state northward) and

Zone 8 (the southern half of the state). The zones are determined by the range of average annual minimum temperatures. The average range of minimum temperatures for Zone 7 is 0 to 10 degrees F, for Zone 8 it is 10 to 20 degrees F.

Landscape plants which are not capable of tolerating temperatures below 10 degrees would not be expected to escape injury during an average winter in Zone 7. However, they should be adequately adapted to Zone 8. For example, pittosporum or gardenia are likely to be damaged every winter and probably will not survive for long in Zone 7. On the other hand, red maple, most hollies, and junipers are adapted throughout the state.

Plant hardiness can be greatly influenced by nearby bodies of water since water buffers change in temperature. Other structures or other plants can shelter landscape plants, enabling marginal species to better tolerate winter conditions. Similar species or different varieties of the same plant species can have different levels of cold hardiness. Kurume azaleas like 'Coral Bell' can be used successfully throughout the state, but Southern Indica azaleas, 'Formosa,' for example, are likely to thrive only in the southern half of the state.

Summer Heat Tolerance

A plant's capacity to survive the stress of high temperature is also a concern. Heat interacts with other environmental factors, especially soil moisture conditions and sunlight to influence the range of adaptability of a plant. Usually associated with high temperatures is rapid depletion of soil moisture, especially in late summer. Direct sunlight increases the severity of heat effects on plants. Since Alabama has periods of high temperatures and short winters,

spruce, hemlock, and yew are generally poor performers in our state.

Moisture Requirements And Soil Drainage

Landscape plants vary widely in the amount of moisture that they need to thrive. If a drought tolerant plant receives a lot of rain, it can be more susceptible to invasion by normally weak pathogens, especially where the soil drains slowly. On the other hand, plants which require large amounts of water for best performance are easily drought stressed when water is withheld or if planted in very well-drained soils. Such conditions may actually attract insect pests to stressed plants.

In addition, plant root function is usually impaired, causing symptoms of nutrient deficiencies to appear. Applications of fertilizer are then wasted because impaired roots cannot take the nutrients up into the plant. Also, in very dry soils the fertilizer is more concentrated, causing root burn of sensitive plants.

Plants that normally require a lot of water can be irrigated so that the ornamental integrity of the plant is maintained. Likewise, soil moisture conditions can be adjusted for drought tolerant plants. This, however, is a use of water resources that could be avoided if consideration was given to appropriate plant selection.

Soil pH

Soil pH (acidity or alkalinity of the soil) can have a profound influence on plant performance. In the prairie soils of Alabama, the soil pH may be alkaline to only slightly acid. In some of these areas, acid-loving plants, such as azalea and rhododendron, will not grow well due to the high soil pH because they have a difficult time taking up iron from these soils. This necessitates the use of a chelated iron fertilizer. Quite often, a complete fertilizer like 8-8-8 is applied which does little good in solving the iron deficiency. Although some of the nutrient elements are taken up into the plant when fertilizer is added,

many of the elements are bound in the soil, and some are leached.

The majority of soils in Alabama have an acid pH, often ranging from 4.5 to 5.5. While this range is ideal for acid-loving plants, many annuals and herbaceous perennials take up nutrient elements less efficiently. Lime and additional fertilizers are usually required to maintain vigorous, attractive growth in these plants. By selecting appropriate plants for the soil pH range, fertilizer and lime inputs could be reduced without risking plant vigor.

Plant Pest Susceptibility

It is unwise to use pest-susceptible plants in areas where those particular pests thrive. For example, most species of euonymus are attacked by euonymus scale. Peaches, apples, crabapples, and ornamental cherries are difficult to grow without some spray program. Other landscape options for plant materials might be selected which do not have the same susceptibilities. Where possible, resistant varieties are the best option.

Nutritional Requirements

Newly set plants often require no additional fertilizer because of the presence of residual fertilizer in the rootball. At this stage, supplying water is far more important than adding fertilizer. Also, most well-established shrubs require less fertilizer to maintain an attractive plant than is usually required by poorly established shrubs. Generally, large trees in the lawn have need for nitrogen only, which is often adequately supplied by fertilizer applied to the lawn.

Light Requirement

Plants which require full sun (at least 8 hours of direct sunlight per day) are weakened in low light situations. Plants that need some shade are often unvigorous and unattractive in full sun. Proper exposure reduces the need for increased pest control efforts. Also, fertilizer is generally more efficiently utilized by the healthy plant.



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For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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Some Trees, Shrubs, Herbaceous Perennials And Annuals For The Landscape

Name	Distribution	Size (Ht.xWidth)	Growth Rate	Type	Exposure	Moisture Requirement	Soil pH
Shade Trees							
Florida Maple <i>Acer barbatum</i>	Statewide	45' x 25'	Med. to Fast	Deciduous	Sun	Moist	Adaptable
Red Maple <i>Acer rubrum</i>	Statewide	45' x 30'	Med.	Deciduous	Sun	Moist	Adaptable
River Birch <i>Betula nigra</i>	Statewide	70' x 40'	Fast	Deciduous	Sun	Moist	Adaptable
Maidenhair Tree <i>Ginkgo biloba</i>	Statewide	60' x 35'	Very Slow	Deciduous	Sun	Adaptable	Adaptable
Southern Magnolia <i>Magnolia grandiflora</i>	Statewide	70' x 45'	Slow to Med.	Evergreen	Sun	Moist	Adaptable
Chinese Pistache <i>Pistachia chinensis</i>	Statewide	45' x 35'	Fast	Deciduous	Sun	Adaptable	Adaptable
Shumard Oak <i>Quercus shumardii</i>	Statewide	85' x 45'	Med.	Deciduous	Sun	Adaptable	Adaptable
Willow Oak <i>Quercus phellos</i>	Statewide	90' x 45'	Med.	Semi-evergreen	Sun	Adaptable	Adaptable
Chinese Elm <i>Ulmus Parvifolia</i>	Statewide	50' x 25'	Fast	Deciduous	Sun	Adaptable	Adaptable
Small To Medium Trees							
Japanese Red Maple <i>Acer palmatum</i> 'Atropurpurea nana'	Statewide	20' x 15'	Slow to Med.	Deciduous	Partial Shade	Moist	Adaptable
Redbud <i>Cercis canadensis</i>	Statewide	25' x 20'	Med. to Fast	Deciduous	Sun	Adaptable	Adaptable
Fringetree <i>Chionanthus virginicus</i>	Statewide	20' x 15'	Med. to Slow	Deciduous	Sun/Partial Shade	Adaptable	Adaptable
Dogwood <i>Cornus florida</i>	Statewide	25' x 20'	Fast	Deciduous	Partial Shade	Moist	Adaptable
American Holly <i>Ilex opaca</i>	Statewide	40' x 25'	Med.	Evergreen	Sun	Moist	Adaptable
Goldenrain tree <i>Koelreuteria paniculata</i>	Statewide	25' x 20'	Med. to Fast	Deciduous	Sun	Dry	Adaptable
Crape myrtle <i>Lagerstroemia indica</i>	Statewide	6' to 25' x 15'	Fast	Deciduous	Sun	Adaptable	Adaptable
Saucer Magnolia <i>Magnolia x soulangiana</i>	Statewide	25' x 25'	Med.	Deciduous	Sun/Partial Shade	Moist	Adaptable
Sourwood. <i>Oxydendron arboreum</i>	Statewide	40' x 20'	Slow	Deciduous	Sun	Moist	Adaptable
Bradford Pear <i>Pyrus calleryana</i> 'Bradfordii'	Statewide	40' x 25'	Med.	Deciduous	Sun	Adaptable	Adaptable
Evergreen Shrubs							
Dwarf Abelia <i>Abelia x grandiflora</i> 'Sherwoodii'	Statewide	3' x 4'	Med.	Evergreen	Sun	Moist	5-6
Goldust Aucuba <i>Acuba japonica</i> 'Variegata'	Central and S. Alabama	6' x 5'	Slow to Med.	Evergreen	Shade	Moist	Adaptable
Boxwood <i>Buxus microphylla</i> var. japonica	Statewide	4' x 4'	Slow	Evergreen	Partial Shade	Moist	Adaptable
Camellia <i>Camellia japonica</i>	Statewide/Central And S. Alabama	12' x 8'	Med.	Evergreen	Shade/Partial Sun	Moist	5-6
Dwarf Burford Holly <i>Ilex cornuta</i> 'Burfordii nana'	Statewide	6' x 8'	Med.	Evergreen	Sun/Partial Sun	Moist/Dry	Adaptable
Rotunda Holly <i>Ilex cornuta rotunda</i>	Statewide	4' x 6'	med.	Evergreen	Sun/Partial Sun	Moist/Dry	Adaptable

Name	Distribution	Size (Ht.xWidth)	Growth Rate	Type	Exposure	Moisture Requirement	Soil pH
Compacta Holly <i>Ilex- crenata</i> 'Compacta'	Statewide	5' x 5'	Slow	Evergreen	Sun/Shade	Moist	5-6.5
Heller Holly <i>Ilex crenata</i> 'Helleri'	Statewide/Central and N. Alabama	3' x 4'	Slow	Evergreen	Sun/Shade	Moist	5-6.5
Dwarf Yaupon <i>Ilex vomitoria</i> 'Nana'	Statewide	4' x 5'	Fast	Evergreen	Sun/Partial	Moist/Dry	Adaptable
Kurume Azalea <i>Rhododendron obtusum</i>	Statewide	4' x 4'	Med.	Evergreen	Shade/Partial Sun	Moist	4.5-6
Deciduous Shrubs							
Crimson Pygmy Barberry <i>Berberis thunbergii</i> var. atropurpurea 'Crimson Pygmy'	Statewide/Central to N. Alabama	2' x 3'	Med.	Deciduous	Sun	Adaptable	Adaptable
Butterfly-bush <i>Buddleia davidii</i>	Statewide	8' x 6'	Fast	Deciduous	Sun	Adaptable	Adaptable
Dwarf Winged Euonymus <i>Euonymus alatus</i> 'Rudy Haag'	Statewide	4' x 5'	Slow	Deciduous	Sun	Adaptable	Adaptable
Border Forsythia <i>Forsythia x intermedia</i>	Statewide	8' x 10'	Fast	Deciduous	Sun	Adaptable	Adaptable
Oakleaf Hydrangea <i>Hydrangea quercifolia</i>	Statewide	6' x 6'	Med.	Deciduous	Partial Sun	Moist	5-6
Bigleaf Hydrangea <i>Hydrangea macrophylla</i>	Statewide	6' x 6'	Fast	Deciduous	Sun/Partial	Moist	5-6.5
Winter Honeysuckle <i>Lonicera fragrantissima</i>	Statewide/Central and N. Alabama	8' x 8'	Fast	Deciduous	Sun/Partial	Moist	Adaptable
Mockorange <i>Philadelphus coronarius</i>	Statewide	10' X 10'	Fast	Deciduous	Sun	Adaptable	Adaptable
Anthony Waterer Spirea <i>Spinea x bumalda</i> 'Anthony Waterer'	Statewide	4' x 5'	Fast	Deciduous	Sun	Adaptable	Adaptable
Koreanspice Viburnum <i>Viburnum carlesii</i>	Central to N. Alabama	5' x 6'	Slow	Deciduous	Sun/Partial Sun	Adaptable	5-6
Old Fashioned Weigela. <i>Weigela florida</i>	Statewide	6' x 6'	Med.	Deciduous	Sun	Adaptable	Adaptable
Groundcovers							
Bugleweed <i>Ajuga reptans</i>	Statewide	6" x 9"	Fast	Evergreen	Shade/Sun	Moist	Adaptable
English Ivy <i>Hedera helix</i>	Statewide	8" Climbing	Fast	Evergreen	Shade/Sun	Moist	Adaptable
Blue Pacific Shore Juniper <i>juniperus conferta</i> 'Blue Pacific'	Statewide	18" x 6'	Slow	Evergreen	Sun	Dry	Adaptable
Bar Harbor Juniper <i>juniperus horizontalis</i> 'Wiltonii'	Statewide	12" x 6'	Slow	Evergreen	Sun	Dry	Adaptable
Japgarden Juniper <i>juniperus procumbens</i> 'Nana'	Statewide	2' x 8'	Slow	Evergreen	Sun	Adaptable	Adaptable
Monkeygrass <i>Liriope muscarii</i>	Statewide	18" x 18"	Slow	Evergreen	Shade/Sun	Moist	Adaptable
Mondograss <i>Ophiopogon japonicus</i>	Statewide	8" x 8"	Slow	Evergreen	Shade/Partial Sun	Moist	Adaptable
Asiatic Jasmine <i>Trachelospermum asiaticum</i>	Central to S. Alabama	6" x 6'	Med.	Evergreen	Partial Sun	Moist	Adaptable
Big Leaf Periwinkle <i>Vinca major</i>	Statewide	18" x 6'	Med./Fast	Evergreen	Shade	Moist	Adaptable
Common Periwinkle <i>Vinca minor</i>	Statewide	6" x 6'	Med./Fast	Evergreen	Partial Sun	Moist	Adaptable

Name	Distribution	Size (Height)	Growth Rate	Type	Exposure	Moisture Requirement	Soil pH
Herbaceous Perennials							
Shasta Daisy <i>Chrysanthemum x Superbum</i>	Statewide	12-36"	Fast	Perennial	Morning Sun	Moist	Adaptable
Coreopsis <i>Coreopsis grandiflora</i>	Statewide	18-36"	Fast	Perennial	Sun	Moist	Adaptable
Sweet William <i>Dianthus barbatus</i>	Statewide	6-18"	Fast	Perennial	Sun	Moist	Adaptable
Pinks (Dianthus) <i>Dianthus deltoides</i> and <i>plumarius</i>	Central and N. Alabama	6-18"	Fast	Perennial	Full Sun/ Morning Sun	Moist	6- 7
Daylily <i>Hemerocallis sp.</i>	Statewide	24-48"	Fast	Perennial	Sun/Partial Shade	Moist	Adaptable
Hosta <i>Hosta plantaginea</i>	Statewide	12-36"	Fast	Perennial	Shade/ Morning Sun	Moist	Adaptable
Candytuft <i>Iberis sempervirens</i>	Statewide	4-10"	Fast	Perennial	Partial Shade	Moist	Adaptable
Gayfeather <i>Liatris spicata</i>	Statewide	24-36"	Fast	Perennial	Sun/Partial Sun	Moist	Adaptable
Moss Phlox <i>Phlox subulata</i>	Statewide	6-12"	Fast	Perennial	Sun	Adaptable	Adaptable
Rudbeckia <i>Rudbeckia sp.</i>	Statewide	18-36"	Fast	Perennial	Sun/Morning Sun	Adaptable	Adaptable
Flowering Annuals							
Snapdragon <i>Antirrhinum majus</i>	Statewide	1 - 4'	Fast	Annual	Morning Sun	Moist	Adaptable
Wax Begonia <i>Begonia x semperflorens-cultorum</i>	Statewide	6-18"	Fast	Annual	Sun/Shade	Moist	Adaptable
Caladium <i>Caladium x hortulanum</i>	Statewide	12-24"	Fast	Annual	Partial Shade	Moist	Adaptable
Coleous <i>Coleus x hybridus</i>	Statewide	10-18"	Fast	Annual	Partial Shade	Moist	Adaptable
Globe Amaranth <i>Gomphrena globosa</i>	Statewide	12-36"	Fast	Annual	Sun	Adaptable	Adaptable
Impatiens <i>Impatiens wallerana</i>	Statewide	6-24"	Fast	Annual	Shade/Partial Shade	Moist	Adaptable
Petunia <i>Petunia x hybrida</i>	Statewide	6-18"	Fast	Annual	Sun	Moist	Adaptable
Salvia <i>Salvia splendens</i>	Statewide	12-36"	Fast	Annual	Sun	Moist	Adaptable
Marigold <i>Tagetes erecta or patula</i>	Statewide	6-40"	Fast	Annual	Sun	Adaptable	Adaptable
Pansy <i>Viola x wittrockiana</i>	Central to N. Alabama	6-12"	Fast	Annual	Morning Sun	Moist	Adaptable