MISSISSIPPI STATE UNIVERSITY EXTENSION

Weed Management Strategies for Ornamental Landscape Beds and Ground Covers

Weed control in ornamental landscapes can be challenging. The diversity of plant material within these systems, and the types of weeds that occur, are much different than those of dense monoculture turfgrass. Frequent soil disturbance and the use of mulches further compound the complexity of weed control.

Figure 1. Perennial ground covers suppress weeds and are easily maintained with preemergence herbicides.

Design and Preparation

Ornamental landscapes require a large degree of planning and preparation in order to maximize their success. The most crucial step in ornamental bed preparation is planning. Selecting plant material and assuring that the soil and site characteristics accommodate those plants is fundamental to successful landscapes. For instance, not all plants necessitate soil renovation; there are many that can readily handle wet, poorly drained soils or, alternatively, dry and unirrigated conditions. Healthy plants that compete with weeds for resources, such as nutrients, sunlight, and water, will help suppress weeds.

Small mass plantings make cultural practices and herbicide selection much easier during the maintenance of landscapes. Complex combinations of broadleaf, grass, and sedge plants may result in areas of the landscape where no chemical weed control is possible and ideal cultural practices are difficult to conduct.

Cultural weed control is crucial to a weed-free landscape. Dense plantings and year-round ground cover provide more weed suppression than even the best herbicide program. Achieving this density often requires multi-tiered plantings of upper-canopy plants supported by underlying ground covers (**Figure 1**).

Water management is an important function of many built landscapes. For example, landscapes can be designed to retain or slow runoff from impervious surfaces, such as roofs and parking lots (**Figures 2 and 3**). These landscapes function to ensure rainwater infiltrates slowly through the natural soil, rather than being forced to run off quickly into sewers and streams. However, landscapes designed for such purposes must address two key issues:

1. too much water runoff may disturb mulch and increase weeds, and
2. too little surface and subsurface drainage may lead to soggy soil and, in turn, unhealthy landscape plants incapable of competing with opportunistic weeds.

Creative hardscapes can help alleviate these issues and also facilitate nonselective weed-control options. These hardscapes should be semi-pervious and accommodate excess runoff without soil erosion. In any case, proper soil amendments to allow drainage and nutrient retention are important principles that should not be overlooked in the design and installation of successful landscapes.

Common Weeds

Ornamental landscape weeds fall into two general categories: annuals that spread by seed and perennials that spread by vegetative material, such as rhizomes and stolons. **Table 1** lists some of the most troublesome weeds.

Figures 2 and 3. Creative hardscapes improve moisture management, decrease disturbance, and facilitate the easy use of nonselective herbicides.

Annual weeds are generally easier to control because they are vulnerable to both hand removal and preemergence herbicides. Control of perennial weeds, such as tree saplings, smilax, poison ivy, nutsedge, Florida betony, and dollarweed, is largely accomplished by mechanical weed control (hand-pulling or hoeing) and application of postemergence herbicides.

Cultural Weed Control

Improper irrigation is most frequently at fault for weedy ornamental beds. When possible, landscape managers should irrigate based upon plant demand rather than using daily or weekly irrigation timers. In most ornamental beds, there are intense flushes of weed emergence during the warm summer months when moisture is excessive (after rainfall or when landscapes are irrigated too much or too frequently).

Mulching materials may help control weeds in ornamental landscapes. When plant canopy is lacking, mulch may help prevent seedling establishment. However, when overapplied, mulch may compromise the health of desired ornamentals. A mulch layer of 1 to 2 inches, and no more than 3 inches, is generally recommended. Apply mulch evenly around the base of shrubs and trees, and do not create mounds or "mulch volcanoes."

Cloth weed barriers are relatively cheap (sometimes less than 10 cents per square foot), but they are rarely used during initial installations around home and commercial landscapes. In some instances where new landscape beds are installed, or old beds are being redesigned, this option makes sense, as long as these areas will not contain living ground covers or annuals.

Table 1.1. Troublesome ornamental landscape annual weeds.

Annual weed species	Scientific name
annual bluegrass	*Poa annua*
crabgrass	*Digitaria* spp.
goosegrass	*Eleusine indica*
foxtail	*Setaria* spp.
broadleaf-signalgrass	*Brachiaria platyphylla*
barnyardgrass	*Echinochloa* spp.
chamberbitter	*Phyllanthus urinaria*
annual sedges	*Cyperus* spp.
annual kyllinga	*Kyllinga sesquiflorus*
cock's comb kyillinga	*Kyllinga squamulata*
doveweed	*Murdannia nudiflora*
spreading dayflower	*Commelina diffusa*
pigweed	*Amaranthus* spp.
Virginia buttonweed	*Diodia virginiana*
chickweed	*Stellaria media*
woodsorrel	*Oxalis* spp.

Table 1.2. Troublesome ornamental landscape perennial weeds.

Perennial weed species	Scientific name
Bermudagrass	*Cynodon* spp.
Florida betony	*Stachys floridana*
false-green kyllinga	*Kyllinga gracillima*
green kyllinga	*Kyllinga brevifolia*
nutsedge	*Cyperus* spp.
knotroot foxtail	*Setaria parviflora*
greenbrier	*Smilax* spp.
dollarweed	*Hydrocotyle* spp.

Mechanical Weed Control

There is no substitute for hand-weeding of landscape beds. Complete chemical and cultural control of weeds is not possible. When hand-removing weeds, it's important to excavate or extract roots because many plants have the ability to regrow from underground roots and stems. Applying mulch afterward may help suppress regrowing weeds.

Chemical Weed Control

Preemergence Herbicides

Preemergence herbicides (**Table 2**) prevent seedling establishment. They must be applied preventively before major weed emergence. Because preemergence herbicides degrade over time, it is necessary to reapply them for adequate year-round coverage. Typical application dates are based on emergence cycles of common landscape weeds.

Apply in the spring before crabgrass emergence when soil temperatures at a 1-inch depth are below 55˚F (typically mid- to late February in Mississippi). Apply a second late-spring/early-summer application roughly 6 to 10 weeks later. Recommendations differ for each product, so always read the label.

Time fall applications before annual bluegrass emergence when soil temperatures fall below roughly 70˚F (typically mid- to late October in Mississippi).

Preemergence herbicides are formulated as either liquid or granular products. Each formulation has some distinct advantages. Liquid applications tend to saturate thick mulch layers and penetrate to the soil layer. Granular products may be able to penetrate dense plant canopies; however, these products can lodge in the sensitive whorls of desired plants.

Table 2. Common preemergence herbicides for ornamental landscapes.

Example product	Active ingredient
Hi-Yield Dimension	dithiopyr
Surflan, Balan	oryzaline
Pendulum 2G	pendimethalin
Pendulum Aquacap	pendimethalin
Lebanon Treflan 5G	trifluralin
Harrell's 4.8G	trifluralin + oxyfluorfen
Freehand	pendimethalin + dimethenamid
Snapshot	trifluralin + isoxaben
Gemini	prodiamine + isoxaben
Showcase	trifluralin + isoxaben + oxyfluorfen
Goal	oxyfluorfen
Ronstar, RegalStar	oxadiazon
SureGuard, BroadStar	flumioxazin
Goose and Crab	oxadiazon + bensulide
Tower	dimethanamid
Devrinol 2G	napropamide
Gallery	isoxaben
Casoron 4G, Barrier	dichlobenil
Specticle G	indaziflam
Barricade 4FL	prodiamine

This is not an exhaustive list and does not imply product recommendations. Always read and follow label directions.

Postemergence Herbicides

Even with preemergence herbicides, some amount of hand-weeding will be required. Selective and nonselective herbicide application may also be necessary. Landscape managers should be properly trained to scout and identify sensitive plant material in order prevent damage to sensitive ornamentals.

When applying any herbicide, make sure to use a sprayer that is thoroughly rinsed and cleaned. The only way to be absolutely sure a sprayer is clean is to avoid using it to apply potentially harmful herbicides.

Grass Control

When applied appropriately, certain herbicides control grasses within broadleaf plantings (**Table 3**). These herbicides are sometimes referred to as ACCase inhibitors. They target a form of the ACCase enzyme that is unique to grass plants. For instance, sethoxydim and fluazifop control bermudagrass in non-grass plantings (e.g., *Lirope,* boxwood, and cedar).

Broadleaf Weed Control

Most ornamental plantings contain broadleaf plants. Herbicides that commonly control broadleaf weeds, such as 2,4-D and dicamba, are not safe on broadleaf ornamentals. However, some of these herbicides may have labels that allow selective application as long as there is no contact with foliage, bark, or roots of desired plant material. **Table 3** suggests several popular postemergence herbicides with labeling for various weeds within certain ornamental plantings. Always use caution because all of these herbicides have the potential to be volatile and/or taken up by roots.

Non-selective Herbicides

Herbicides such as Round-up (glyphosate), Reward (diquat), and several other similar products cause injury and death of most ornamental weeds and landscape plants. Therefore, they should be used sparingly and only when applied selectively to undesirable weeds.

Conclusion

Proper design and installation, combined with cultural and mechanical weed-control methods, reduce pesticides required to maintain ornamental landscapes. Best practices include using proper site preparation and managing water to increase plant health and decrease soil disturbance. When herbicides are necessary, preemergence applications are the most effective strategy against common landscape weeds. When applied routinely, and before the germination cycle of common weeds, these herbicides are relatively safe and effective. Due to the diversity of plant material within ornamental landscapes, selective postemergence herbicides are scarce, and nonselective postemergence herbicides must be used carefully to prevent injury to desired plants.

For more information, please see MSU Extension ***Publication 1532 Weed Control Guidelines for Mississippi***.

Table 3. Common postemergence herbicides for ornamental landscapes.

Weeds controlled or suppressed	Trade name	Active ingredient	Labeled on
grasses	Segment, Vantage, Grass Getter	sethoxydim	mondograss, *Liriope*, monkeygrass, other broadleaf plantings
	Fusilade II, Ornamec	fluazifop	
	Envoy Plus	clethodim	
	Acclaim Extra	fenoxaprop	
broadleaf weeds, yellow nutsedge, some grasses	Basagran	bentazon	ajuga, boxwood, impatiens, English ivy, marigolds, ornamental cabbage, petunias
yellow and purple nutsedge, *Kyllinga* species	Sedgehammer, ProSedge	halosulfuron	Can be applied over the top of some ground covers and around the base of many woody ornamental trees and shrubs.
yellow and purple nutsedge, *Kyllinga* species, pigweed, deadnettle, clover, hairy bittercress, chickweed, sicklepod	Image	imazaquin	Most ground covers, including *Liriope*, Asiatic jasmine, juniper, and hosta, as well as around the base of many woody ornamental trees and shrubs.

This is not an exhaustive list and should not imply product recommendations. Always read and follow label directions.

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