

Improving Weed Control in Landscape Planting Beds¹

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Introduction

Controlling weeds in landscape beds can be a difficult endeavor. Most landscape beds contain a variety of trees, shrubs, and bedding plants, which makes choosing herbicides difficult. As a result, weed control in planting beds is usually achieved by using mulch, hand pulling weeds, or occasionally spot spraying with glyphosate (RoundUp and others) or another non-selective postemergence herbicide. While these methods are effective, they can be labor-intensive. Many often overlooked chemical and non-chemical weed control methods can significantly improve weed control and reduce maintenance costs.

Designing with Weed Control in Mind

The concept of “right plant, right place” (e.g., selecting plants suited for a particular site, choosing disease- and pest-resistant varieties, using native ornamental species, and following proper cultural practices) has been embraced by many in the landscape design and maintenance industries as a way to avoid some of the most troublesome insect and disease pests. Though this design philosophy may also suppress weed growth, it has rarely been used for that purpose.

Light stimulates the germination of many different weed species. In nature, these species quickly colonize a site that has been opened up by some sort of disturbance. Weeds invade by filling in voids. Designing landscape beds so that ornamentals will occupy most of the space (without overplanting) will prevent many weeds from establishing. Choosing dense-growing plants that are best suited for your area will help fill in voids more quickly and potentially shade out weeds. Using fast, dense-growing groundcovers in areas not suitable for turf can suppress weed growth and, in most cases, reduce the need for water and fertilizers. Lists of possible groundcovers for Florida can be found at the Florida-Friendly Landscaping Plant Database <http://floridayards.org/fyplants/>. Information on proper landscaping practices and design principles is available at the University of Florida’s Florida-Friendly Landscaping™ website fyn.ifas.ufl.edu.

Controlling Weeds before Planting

The best time to control existing weeds in an ornamental bed is before anything has been planted. Herbicides such as glyphosate (RoundUp and others) can be used to control both annual and perennial weeds. Depending upon the weed species, these herbicides typically take seven or more days to completely kill larger weeds (6 inches or taller).

1. This document is ENH1262, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date June 2015. Revised November 2018. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.
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After the existing weeds die (no green tissue remaining), the area can be tilled, graded, and prepared for planting.

It is very important to know what kind of plants will be planted into an area before using any herbicide. For example, imazaquin (Image) is a common turf and landscape herbicide used to control purple nutsedge (*Cyperus rotundus* L.) and other weed species, but it should not be applied to areas where ornamentals (especially bedding plants) will be planted within one year. Halosulfuron (SedgeHammer and others) is another herbicide that should not be applied to areas in which ornamentals will be transplanted within three months. A list of postemergence herbicides labeled for use in landscape planting beds is given in Table 1. A more complete list of postemergence herbicide labeled for use in and around ornamentals in landscapes is available at <http://edis.ifas.ufl.edu/wg059>.

An effective non-chemical method of reducing annual weed pressure is to repeatedly till, allow weeds to germinate, and then hoe or till again. This process works by essentially depleting the weed seed bank in the upper layers of the soil surface. Each time the area is tilled and small weeds are allowed to germinate, the amount of weed seeds lying dormant in the soil can be reduced.

Soil solarization can also be a very economical and effective method of controlling weeds and other pests before planting, though it is typically only effective if done during the summer months in full sun areas. This process also takes about six weeks to be effective, so it may not be feasible in some landscape situations. An introduction to soil solarization can be found at <http://edis.ifas.ufl.edu/in856>.

All of these methods will help you get a head start on your weed management program and reduce future weed pressure.

Controlling Weeds at Planting

Container-grown plants may contain weeds. Always check the media surface for presence of small weeds and remove them before planting. While most of the weeds on the media surface may be buried during planting, many weed species can continue to grow, especially since supplemental irrigation will likely be applied to new planting areas. Eliminating these weeds before planting will help to reduce future weed pressure.

Using Proper Cultural Practices

Irrigation

Properly irrigating landscape beds can go a long way in reducing weed growth. Many common landscape weeds such as eclipta (*Eclipta prostrata*) and gripeweed (*Phyllanthus urinaria*) require high soil moisture levels in order to germinate. Using conventional overhead sprinkler systems to irrigate landscape beds can cause increased weed growth because bare areas (those without plants) will be irrigated. Using micro or drip irrigation systems instead of standard sprinklers helps to reduce weeds because water will be placed only where desirable plants need it. This practice also helps to conserve water and reduce water bills.

Fertilization

Excessive fertilizer use in landscape beds promotes weed growth and may damage ornamental plants. Fertilizers should be applied to landscape plants only when needed and according to UF/IFAS recommendations (http://fyn.ifas.ufl.edu/handbook/Fertilize_Appropriately_vSept09.pdf). Most established trees and shrubs require very little fertilization, so any excess fertilizer may promote weed growth.

Some fertilizers are sold in combination with herbicides, which allow applicators to kill weeds and apply fertilizer (“weed-’n’-feed”) at the same time. It is important to note that these weed-’n’-feed products are marketed for use in turf. Weed-’n’-feed products should not be applied near ornamentals nor ever applied in ornamental planting beds. In most cases, you will be able to better time your herbicide and fertilizer applications by applying them separately. In many cases, this practice may also be more affordable.

Controlling Weeds after Planting

Mulching

Mulching is one of the most effective weed control strategies in landscape planting beds and provides additional benefits, including improved soil characteristics, increased growth of ornamental plants, decreased irrigation demand, and enhanced planting bed aesthetics. In many cases, mulching can be just as effective for weed control as herbicides.

Apply organic (pine bark, pine straw, etc.) mulches at depths of 2 to 3 inches (Figure 1). This depth effectively controls weeds without causing damage to ornamentals by smothering their root systems. Inorganic mulch (rocks, pebbles, etc.) can often be applied at shallower depths (1

to 1.5 inches) while still providing weed control; however, it should be noted that these products are more expensive, more difficult to apply, and do not add organic matter to the soil.



Figure 1. Coarse pine bark nuggets and other mulch materials can help to suppress weed germination and growth in landscape planting beds.

Credits: Annette Chandler, UF/IFAS

Ground cloth, or landscape fabric, is also popular with some homeowners, but these materials may be difficult to install in existing mature landscapes and can potentially damage ornamentals if they root into the fabric. When weeds inevitably begin growing on top of or through the fabric, they will be more difficult to hand pull.

Almost any material can be used as a mulch, but when using mulch for weed control, pick a coarse, large-particle material. Research has shown that weed control increases as particle size increases because larger particle mulch materials tend to block out more light and dry out faster, which prevents weed germination (Billeaud and Zajicek 1989). Fine-textured and nutrient-dense materials such as composts are not suitable for weed control and may actually increase weed growth (Chalker-Scott 2007).

When factoring in mulch cost, consider both the initial cost and how long the mulch material will last. Some mulches are very cheap or even free (grass clippings, leaves, ground yard waste), but they may also degrade more quickly and thus require frequent reapplication, increasing the yearly cost. Research at the University of Florida has shown that mulches such as pine bark and melaleuca (bark and wood) last longer than mulches such as utility mulch (ground tree trimmings) and pine straw. For more information on the longevity of different landscape mulches, see *Landscape*

Mulches: How Quickly Do They Settle? at <http://edis.ifas.ufl.edu/fr052>.

Non-Chemical Weed Control Methods

There are several other non-chemical weed control methods that are effective, including hand pulling and cultivation (tillage), though the major disadvantage of these methods is that these methods are typically time consuming and can damage ornamentals, respectively. More information on advantages and disadvantages of each of these methods and other non-chemical methods is available in *Non-chemical Weed Control for Home Landscapes and Gardens* at <http://edis.ifas.ufl.edu/hs1170>.

Herbicides

Preemergence Herbicides

Use of preemergence herbicides can significantly reduce the amount of time and money needed to hand pull or spot spray weeds in ornamental beds. Many homeowners or landscapers avoid using preemergence herbicides in landscape beds for fear of damaging ornamentals. While it can be difficult to find preemergence herbicides that are safe to use on tropical species or annual bedding plants, if applied according to label instructions, many preemergence herbicides can be applied over the top of woody shrubs and trees without causing any damage. A list of preemergence herbicides labeled for use in landscape planting beds is included in Table 2.

Once applied, preemergence herbicides must be activated by rainfall or irrigation in order to work. Most products typically need to be watered in with 0.25 inches or more of rainfall or irrigation soon after application (within three days to a week or more, depending on the product). If preemergence herbicides are not watered in, erratic or inconsistent weed control may result. If overhead irrigation is not available, try to time the preemergence herbicide application with expected rainfall or use portable lawn sprinklers to water in the product. Irrigation is the preferred method because very heavy rainfall soon after application is likely to increase lateral off-site movement, which can lead to environmental concerns. Avoid preemergence herbicide applications if heavy rainfall is imminent.

Drip or mist irrigation (microirrigation) is recommended in planting beds to conserve water. These microirrigation systems also work to reduce weed pressure by placing water only where it is needed near plant roots (see “Irrigation” above). However, it should be noted that these systems will not properly activate preemergence herbicides. If

microirrigation systems are used, the herbicide will still need to be watered in using the methods described above.

Disturbing the soil surface following an herbicide application will reduce herbicide efficacy. Remove existing weeds prior to herbicide application and try to avoid disturbing the soil surface (excessive walking, raking, hoeing, etc.) after application.

In order to avoid injuring ornamental plants with preemergence herbicide applications, the following precautions should be taken in most cases:

- Do not apply granular herbicides to wet foliage.
- Do not allow granular herbicides to become trapped in whorls of foliage or remain on leaf surfaces after application.
- Do not apply preemergence herbicides during times of bud swell, budbreak, or when ornamentals have tender, new flushes of growth.
- Before applying preemergence herbicides, ensure plants have been thoroughly watered after planting and that the soil is settled (no cracks).
- Do not apply preemergence herbicides to ornamentals that are not on the label.
- Irrigate as soon as possible after application to wash herbicides off of plant foliage and activate the herbicide.

However, it is important to note that these precautions are only general guidelines, and applicators should read product labels and follow instructions for each specific product they are applying.

Postemergence Herbicides

If weeds still begin growing after following proper cultural practices (fertilization and irrigation), mulching, and using preemergence herbicides, postemergence herbicides can be used to spot spray weeds. While most postemergence herbicides should be applied as a directed application (making no contact with the ornamental plant), some can be applied over-the-top of certain ornamentals if listed on the herbicide label. While over-the-top applications can be a useful tool in some landscape situations, it is critical that the application be applied according to label instructions and the application equipment is properly calibrated. If these herbicides are applied at higher than recommended rates, ornamental plants can be severely injured and may not recover.

In order to avoid ornamental plant injury from postemergence herbicides, the following precautions should be taken.

- Do not allow herbicide spray or drift to contact ornamental plant tissues unless the product label indicates otherwise.
- If accidental contact is made, wash herbicide off of plant foliage as soon as possible or, if a systemic (translocated to other parts of the plant) herbicide is used, prune the section of the ornamental that is contacted to minimize potential damage.
- Ensure over-the-top applications are made only to ornamentals listed on product labels.
- Systemic herbicides should be used with extreme caution around plants that sucker (i.e. crape myrtle and others). Some ornamentals may not recover from accidental contact.

Some turf herbicides can cause damage to ornamentals if applied near their root systems. Many ornamentals can have roots that extend well into turf areas. Closely read product labels and follow all precautions to avoid potential damage from root uptake.

Resistance Management

It is common for herbicide applicators (and homeowners) to choose one or two herbicides that they are comfortable with and use them repeatedly in the same areas. However, weed populations can become resistant to herbicides if the same modes of action are used over and over in the same areas. It is important to avoid repeatedly using herbicides that have similar target site modes of action (Table 2). This practice can reduce the chances of herbicide resistance development and also will improve weed control. No herbicide controls all the weeds, and when the same product is repeatedly used, the uncontrolled weeds will take over.

References

- Billeaud, L. A. and J. M. Zajicek. 1989. "Influence of mulches on weed control, soil pH, soil nitrogen content, and growth of *Ligustrum japonicum*." *J. Environ. Hort.* 7:155–157.
- Chalker-Scott, L. 2007. "Impact of mulches on landscape plants and the environment – a review." *J. Environ. Hort.* 25: 239–249.

Mallory-Smith, C. A., and E. J. Retzinger. 2003. "Revised Classification of Herbicides by Site of Action for Weed Resistance Management Strategies." *Weed Technology* 17 (3): 605–619.

Table 1. Partial list of postemergence herbicides labeled for use in landscape planting beds.

Common Name (active ingredient)	Example trade name	WSSA Herbicide Group ¹	Application Method ²	Notes: ³
clethodim	Envoy Plus	1	Over-the-top	Controls grass weeds. Safe on many ornamentals.
fenoxaprop-ethyl	Acclaim® Extra	1	Over-the-top	Controls grass weeds. Safe on many ornamentals.
fluazifop-butyl	Fusilade® II, Ornamec®	1	Over-the-top	Controls grass weeds. Safe on many ornamentals.
sethoxydim	Segment	1	Over-the-top	Controls grass weeds. Safe on many ornamentals.
halosulfuron	SedgeHammer®	2	Directed	Good control of sedge species. Ornamentals should be planted for 3 months prior to application. Wait 4 weeks to plant in treated areas.
sulfosulfuron	Certainty®	2	Over-the-top	Controls some broadleaf, grass, and sedges. If applying pre-plant, wait 14 days before planting ornamentals.
clpyralid	Lontrel® Turf & Ornamental	4	Over-the-top	Controls broadleaf weeds. Controls leguminous weeds. Can be used in non-residential turf areas.
bentazon	Basagran® T/O	6	Over-the-top	Controls broadleaf weeds and yellow nutsedge.
glyphosate	RoundUp®, many others	9	Directed	Use of spray-shields is recommended when applying in close proximity to ornamentals.
glufosinate	Finale®	10	Directed	Non-selective. Thorough coverage needed. Ornamentals can be transplanted into treated areas after 12 hours.
diquat	Reward®	22	Directed	Non-selective, fast-acting contact herbicide. Thorough coverage needed. Most effective on small weeds.
pelargonic acid	Scythe®	27	Directed	Non-selective, fast-acting contact herbicide. Thorough coverage needed. Most effective on small weeds.

¹ Herbicide groups are based according to primary sites of action and can be used to select herbicides that have differing sites of action (Mallory-Smith and Retzinger 2003)

² Over-the-top means this product can be applied over ornamental species listed on product labels. Directed means this product should not come into contact with ornamental plant tissues. Read each product label for a complete list of application instructions and tolerant ornamental species.

³This section serves only as a general guideline. Applicators are required to read each product label before use in order to know proper rates, application techniques, use sites, and tolerant ornamentals.

Table 2. Partial list of preemergence herbicides labeled for use in landscape planting beds.

Common Name (active ingredient)	Example Trade Name and Formulation	WSSA Herbicide Group ¹	Can be applied to turfgrass?	Notes ²
dithiopyr	Dimension® 2EW	3	YES	Over 440 ornamentals safe for over-the-top applications. Can be tank-mixed with Gallery for increased weed control.
oryzalin	Surflan® 4AS	3	YES	Good control of annual grasses.
pendimethalin	Pendulum® 2G	3	YES	Safe for use on many annual and perennial bedding plants.
	Pendulum® 3.3EC, 3.8AC		YES	Safe for use on many ornamental grass species.
prodiamine	Barricade® 4FL, 65 WG	3	YES	Can be applied over-the-top of hundreds of ornamental species.
trifluralin	Treflan 5G	3	NO	One of the safer herbicides for use in bedding plants but may not last as long as some other herbicides.
flumioxazin	Broadstar™ 0.25G	14	NO	Long-lasting weed control. Do not apply to wet foliage or new flushes of growth.
	SureGuard® 51WDG			Directed applications only. Can provide early postemergence control of small weeds.
oxadiazon	Ronstar® 2G	14	YES	Many newly transplanted ornamentals can be treated safely.
dimethenamid-p	Tower® 6EC	15	YES	Yellow nutsedge control. Safe on hundreds of ornamentals.
s-metolachlor	Pennant Magnum® 7.6 EC	15	YES	Yellow nutsedge control. Safe on hundreds of ornamentals.
isoxaben	Gallery® 75DF, 4.16SC	21	YES	Over 700 ornamental plants on label.
indaziflam	Specticle FLO® 0.622 SC	29	YES	Apply as a directed application. Good efficacy of annual weeds.
	Specticle® 0.0224G			Safe on many landscape plants. Do not use on bedding plants.
benefin + oryzalin	XL 2G	3 + 3	YES	Can be applied to many established annual bedding plants.
pendimethalin + dimethenamid-p	FreeHand® 1.75G	3 + 15	YES	Safe for use on many trees, shrubs, and bedding plants.
trifluralin + isoxaben	Snapshot® 2.5TG	3 + 21	NO	Over 600 landscape plants on the label.
oxyfluorfen + oryzalin	Rout® 3G	14 + 3	NO	Over 120 plants on label. Water in as soon as possible after application.
oxyfluorfen + pendimethalin	OH2® 3G	14 + 3	NO	Safe on many woodies but do not use on bedding plants.
oxyfluorfen + prodiamine	Biathlon® 2.75G	14 + 3	NO	Safe on many woodies but do not use on bedding plants.
oxyfluorfen + trifluralin	Granular Herbicide 75 5G	14 + 3	NO	One of the few herbicides with plumbago on label.
oxyfluorfen + oxadiazon	Two OX E-Pro 3G	14 + 14	NO	Few ornamentals on label.

¹ Herbicide groups are based according to primary sites of action and can be used to select herbicides that have differing sites of action (Mallory-Smith and Retzinger 2003).

² This section serves only as a general guideline. Applicators are required to read each product label before use in order to know proper rates, application techniques, use sites, and tolerant ornamentals.

³ Not for use on home lawns