

Daylily Production and Landscape Care: A Planned Approach to Weed Management

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Anticipate Weeds:

Daylily enthusiasts and commercial producers who put their heart and soul into the care and production of daylilies receive great satisfaction for their effort. However, while daylilies are vigorous, they are not immune from weed competition. This article provides information that will assist daylily enthusiasts and commercial producers in developing a planned approach to weed management in production and landscape plantings.

Weeds are to be anticipated. Where growing conditions are favorable for optimum plant development, conditions are also ideal for weed development. The primary reasons for minimizing weed development include: 1) reduced competition above and below ground which can hinder shoot, crown and root development, 2) decreased need for fertility and irrigation, 3) reduced material and labor costs associated with physical or chemical removal of weeds and, 4) weed free daylilies to meet consumer demands.

Weed Management Objective:

Overall, the weed management objective for daylily production and landscape care is to develop a pro-active, planned approach that limits weed development and competition. Pro-active management limits the need for costly and frustrating reactive weed control practices such as hand weeding or means of physically removing weeds. Completely eliminating the need for physical removal of weeds would be ideal. Often, however, the best that can be achieved is optimized weed management that minimizes escaped or established weeds. Achieving this objective requires integrating all weed control options available within the management system used for plant production or care.

Management Systems for Daylily Production and Care:

Daylilies require weed control in three management systems: field production, container production and landscape bed management.

a. *Field production:* Field-grown plants are generally grown either on flat land or in raised beds.

Since native soil is used for the growing media, weeds can develop from soil borne seeds and vegetative propagules and wind-blown seeds.

b. *Container production*: Containerized plants are grown in clay pots or plastic containers. These are generally maintained on a pad covered with gravel or weed-control fabric. Native soil could be used in this system. More commonly, artificial substrates are used as the growing medium. Artificial substrates such as pine bark or sphagnum peat moss are easier to work with and reduce the physical weight of the product being handled. Properly composted artificial media is free of weed propagules. Thus, weed management focus will be placed on preventing weed introduction and development into established containers.

c. *Landscape bed management*: In landscape beds, artificial media may be used as an amendment, but most commonly, native soil is the growth substrate. In the landscape, weed development can occur from soil-borne seed, vegetative propagules and wind-blown weed seeds. Each requires consideration.

Weed Management Options: Options for weed management in daylilies include: physical removal of emerged weeds, pre-site assessments and pre-plant control, landscape fabric or gravel, mulch, preemergence and postemergence herbicides.

a. *Physical weed removal*: Physical removal of weeds is slow, costly and frustrating. Weed species have very different growth forms and competitive potential and very little research has been conducted that identifies the influence of specific weed species on daylily growth. As a general rule during the growing season, however, most emergent weeds are expected to become competitive after seven to ten days. Thus, scouting for emerged weeds should be conducted weekly. Emerged weeds may indicate the need for an adjustment of the weed management plan to minimize reoccurrence. If weeds are present, they should be identified and treated with control options based on their type and life cycle. Emerged grassy weeds may be controlled with a selective postemergence herbicide. Emerged broadleaf weeds may be controlled with a non-selective herbicide applied as a directed or a spot treatment to avoid injury to the daylilies. Where herbicide options are not available or weed populations are light, weeds may be removed physically.

The subsequent discussion focuses on steps that limit weed development and thus limit the need for labor-intensive hand or physical removal of weeds.

b. *Pre-site assessment and pre-plant control*: In field production and landscape bed management where plants are grown in native soil, assess the site prior to planting to ascertain which weed species are present or may be anticipated, particularly perennial weeds, including sedges and broadleaf weeds. If possible, use fields or planting areas free of more problematic perennial broadleaf weeds like wild violet, ground ivy, wild strawberry and mugwort. Once the planting is established, perennial weeds will be the most difficult to control. Even hand-removal may be ineffective. Thus, pre-site assessment and pre-plant control will be very beneficial.

For pre-plant control, one successful approach has been the protocol described below. Glyphosate (e.g. ROUNDUP), a non-selective herbicide that has activity towards emerged grass, sedges and broadleaf weeds. This herbicide also has systemic activity providing control of both above- and below-ground growth of perennial weeds. Treat the

planting area. Allow seven to thirty days for the glyphosate to be translocated and gain control of above- and below- ground growth. Then, till the area to stimulate additional germination of annual weeds and the re-emergence of surviving perennial weeds. Once sufficient weed re-growth has occurred, repeat glyphosate application and tillage 7 - 30 days later. Repeating this cycle at least twice, even if perennials are not present, will reduce the weed seed bank in soil.

For final land preparation, conduct a shallow cultivation (2 to 3 inches deep) to promote the germination of annual weed seed in the top 2 inches of soil. Then treat with glyphosate and plant three to ten days later into undisturbed soil. This is referred to as the “stale seed bed approach”, which is commonly used in commercial vegetable crop production.

In container production with pre-treated or soilless media, pre-plant control is not a concern. In assessing a new site for container production, however, assess border areas to manage weeds that produce wind-blown weed seed.

c. Landscape fabric or weed barrier: Landscape fabric will not impede the development of perennials like daylilies with a clump-type growth habit (as opposed to a rhizomatous perennial). Although they are available, physical weed barriers are not widely used for field and container daylily production. However, some producers have been successful with use of landscape fabric in field production. When exposed to the sun, the impact of the sun’s rays on the black fabric will cause excessive heat accumulation. It is beneficial to cover the fabric with a thin layer of mulch. For container production, modified fabrics are available to insert onto the top of the container media. Again, it may be beneficial to cover this fabric with a thin layer of mulch. In landscape beds, landscape fabrics are more frequently used. A quality landscape fabric covered with a 3-inch layer of mulch makes a very effective barrier to weed emergence. In small landscape beds, using layers of newspaper as a weed barrier may achieve some benefit for the first few months or first growing season. Three sheets of standard or non-colored newspaper covered with a 3-inch mulch layer are ideal. More than three layers limits water movement to the underlying soil.

d. Mulch: In container production, the artificial media achieves, to some extent, the objective of a mulch layer. For large-scale field production, mulch application may not be practical in the field, for many producers. Even though traditional mulch use may not be practical, cover crops and no-till or reduced tillage production technology might have potential. Research is needed to determine how to adapt these practices from agronomic crop production into field daylily production. In landscape beds, using a 3-inch mulch layer can arrest weed development. The mulch type should allow water to pass readily through to the underlying soil. Very fine or heavily organic mulch holds water and provides an environment favorable for wind-blown weed seed germination on the mulch surface.

e. Herbicides: Herbicide usage requires patience, sound advice and practical experience. However, efficient usage of the appropriate herbicides, applied at the right times, and in the correct amounts can drastically reduce weeds in a daylily planting. Herbicides registered for use in daylilies can be divided into two main groups. Preemergence herbicides limit weed pressure by preventing weed seedling emergence. Postemergence herbicides provide control of

emerged weeds. In the absence of landscape fabric or soil surface physical weed barrier or mulch, attention to an effective preemergence herbicide program will be critical.

Preemergence herbicides offer the advantage of residual control by preventing weed seedling emergence for up to several weeks (depending on the product) after the herbicide is applied. The active ingredient of the herbicide is an organic molecule that decomposes with time through chemical reactions in the soil, interaction with light and activity of microorganisms that use the herbicide molecule as a food resource. Season-long control is dependent on timely re-treatment. Frequency of re-treatment depends on length of residual control which is product-dependent. Timely treatment and re-treatment to weed-free soil or media maintains an effective herbicide concentration in the soil or media.

The range of weed species that are controlled by the herbicide is product dependent. Certain herbicides are very effective at preventing grassy weeds from emerging from seed, but have limited activity on broadleaf weeds. Other herbicides may be very effective in preventing several broadleaf weeds from emerging from seed, but may have limited or no activity against grassy weeds emerging from seed. Ideally, the objective would be to gain broad-spectrum control of both grass and broadleaf weeds. To achieve this, product selection is critical. Product selection may involve applying more than one herbicide or a product that contains more than one herbicidal active ingredient. Even with a combination approach, not all weeds may be prevented. However, expect that weed emergence will be drastically reduced. One additional note: moving preemergence herbicides into the top 1 to 2 inches of soil or media requires the action of rain or irrigation is required. Due to adsorption and low water solubility, the herbicides will then remain in the top 1 to 2 inches of soil or media for the residual life of the product.

Postemergence herbicides are used to control actively growing weeds. Certain herbicides for use in daylilies are selective. They will control emerged grassy weeds with no injury to the crop. For established broadleaf weeds in daylilies, herbicide options are very limited. Non-selective (provide activity towards all plants) herbicides must be used, either as a spot treatment or as a directed application that avoids contact with the daylily plants. Herbicides that can be applied overtop of the daylily plants without causing crop injury while still controlling emerged broadleaf weeds, are not registered.

Review of Weed Management Options:

Clearly, physical removal of weeds creates the greatest problem for growers and landscape managers. For annual weeds, physical removal is effective. For perennial weeds like wild violet, wild strawberry and perennial sedges, physical removal may be ineffective. Not all of the underground reproductive structures can be reached in a single hand-weeding event. Thus, the emphasis of a sound weed management program should be to prevent weed establishment by:

1. Initiating pre-plant control measures,
2. Establishing physical weed emergence barriers of weed barrier fabric,
3. Installing an effective mulch layer (as appropriate),
4. Developing a preemergence herbicide program focusing on product choice.
This should be based on weed history and potential weed development and include timely applications to weed-free areas and timely re-treatment.

5. Control of escaped weeds by appropriate postemergence herbicide option or physical removal. Consider adjustments in preventative weed management plan.

The following discussion includes information on weed types and their life cycles to assist in formulating a weed management plan.

Weed Types and Life Cycles:

Weeds that are commonly encountered in daylilies can be divided into three groups: broadleaf weeds, grassy weeds and sedges. Within each group, weeds may have one of three basic life cycles: as summer annuals, winter annuals or perennial growth.

Types:

Broadleaf weeds - Broadleaf weeds are generally easiest to identify. They have leaves that are wide, eg. dandelion and clover. Leaves are generally produced in pairs or multiples that are detached from the main stem by a sub-stem or petiole. Leaves may be simple (having one leaflet, like dandelion) or compound (having more than one leaflet, like clover). In most cases, veins within the leaf have a net-like appearance.

Grass weeds - Identifying individual grass species is more difficult. All grasses are similar in appearance, especially when seed heads are absent. Leaves of grasses are not detached from the main stem and are narrow with a blade-like appearance. Leaves are produced singly in two vertical rows. Veins within leaves run parallel to the leaf margin and each other. Stems may be rounded or flattened.

Sedges - Sedges, like yellow nutsedge, are not actually grasses. While they have leaves that are similar in appearance to grasses, sedges have two key identifying characteristics. Leaves are arranged in three vertical rows. Stems are triangular. Since herbicides used to control grass weeds are generally not effective on sedges, it is important to distinguish between them.

Life Cycles:

Summer and winter annuals reproduce and spread by prolific seed production that serves as a ready source of infestation and establishment when conditions are favorable. Annual grass and broadleaf weeds may be winter annuals, summer annuals or perennials. Certain perennials initiate from seed at the same time as winter annual or summer annual weeds, but once established will live for several years. These distinctions are important, because optimizing preemergence herbicide choice, application method and timing can effectively arrest weed seedling development.

Summer annuals - Annuals complete their life cycle within 12 months. Summer annuals generally germinate in the spring, grow or develop during the summer, produce seed and die by the fall or after the first hard frost.

Winter annuals - Winter annuals complete their life cycle in 12 months but generally overlap two calendar years. They germinate in late summer to early fall and begin to develop. Winter annuals are dormant or semi-dormant through the winter and flower the following spring. Winter annuals mature and die in late spring or early summer.

Perennials - Perennials live for more than two years and may regenerate indefinitely. A simple perennial, like dandelion, may germinate from seed, but produces a tap root that, when severed, can produce a new plant. A complex perennial can spread by seed in addition to creeping above-

or below-ground vegetative structures (such as stolons, rhizomes or nutlets) capable of initiating a new plant. Perennial weeds are often the most difficult to control. Usually you are trying to control an established plant that has already produced considerable vegetative reproductive structures that may require repeat control measures. Removal of the above-ground shoot growth does little towards long-term control. Long-term control usually requires herbicide treatments that act on the above- and below-ground structures.

The most important part of the above discussion is to recognize that we can anticipate the development of seasonal populations of annual grasses and broadleaf weeds. Annual grass and broadleaf weeds will emerge from seed in three flushes: in the fall, spring and throughout the summer. For certain perennials like the sedges, unless a history of sedge problems is known seasonal seedling emergence of such perennials is not anticipated. New sedge populations are not expected to develop spontaneously. Exceptions commonly occur, however, when untreated fill dirt or topsoil is introduced to the landscape.

Summary and Formulating Weed Management Plan:

Weed development in daylily plantings can be anticipated. Overall, the focus of an effective weed management plan is to minimize weed development (for the benefits of limiting competition with the crop, decreasing production inputs of fertility and water usage, minimizing maintenance costs and providing weed-free aesthetics or weed-free crop). Weed management options will depend on the production system or landscape care and may include: pre-site assessment and pre-plant control, physical weed barrier, mulch, preemergence herbicides, postemergence herbicides and hand or physical removal of emerged weeds. The overall focus is to optimize these weed management options in a planned approach to minimize weed development.

The following offers brief summaries of weed management options classified by the production system or landscape maintenance regime:

Field Production:

- Assess new site for problem perennial weeds and conduct a pre-plant control procedure.
- Consider landscape fabric covered with a thin mulch layer.
- In the absence of landscape fabric, utilize a preemergence herbicide program. Focus on optimum product choice. Product use is dependent on weed species and anticipated life cycles, application method and application timings. Timing is based on residual control expectations, which is product-dependent.
- Control escaped annual and perennial grasses with herbicide options selective for grass weeds.
- Use non-selective herbicides to control escaped annual and perennial broadleaf weeds. Avoid crop contact to avoid crop injury or loss, or use hand/physical removal.

Container Production:

- In a new or existing site, assess border areas for weeds that produce wind-blown weed seeds. Focus on sanitation to limit weed introduction.
- Consider modified weed barriers to cover the container media.
- In the absence of a weed barrier on the container medium, utilize a preemergence herbicide program. Focus on optimum product choice. Product use is dependent on weed species and anticipated life cycles, application method and application timings. Timing is based on residual control expectations, which are product-dependent.
- Control escaped annual and perennial grasses with herbicide options selective for grass weeds.
- Careful use of non-selective herbicides for escaped annual and perennial broadleaf weeds. Avoid crop contact to avoid crop injury or loss or use hand/physical removal.

Landscape Management:

- Assess new site for problem perennial weeds and conduct a pre-plant control procedure.
- Consider landscape fabric covered with an optimum mulch layer.
- In the absence of landscape fabric, utilize a preemergence herbicide program. Focus on optimum product choice. Product use is dependent on weed species and anticipated life cycles, application method and application timings. Timing is based on residual control expectations, which are product-dependent.
- Control escaped annual and perennial grasses with herbicide options selective for grass weeds.
- Use non-selective herbicides to control escaped annual and perennial broadleaf weeds. Avoid crop contact to avoid crop injury or loss or use hand/physical removal.

Herbicide Options for Daylily Production and Care:

The following provides a link to a document dealing with specific herbicide options for use in daylily production and care. Provided in this text is discussion on specific products, rates, use directions and precautions.

[Herbicide Options for Daylily Production and Landscape Care \(PDF file\)](#)

Selected or Suggested Reference:

The following references are suggested to aid in weed identification and herbicide selection, application method and application timing;

1. Weeds of the Northeast. By Richard H. Uva, Joseph C. Neal and Joseph M. DiTomaso. Published by Cornell University Press.
2. Weed Control Suggestions for Christmas Trees, Woody Ornamentals and Flowers. By Joseph C. Neal, Walter A. Skroch, Jeffery F. Derr and Andrew Senesac. Published by North Carolina Cooperative Extension Service, North Carolina State University.