

Preemergence Herbicides for Use in Ornamentals¹

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Preemergence herbicides, by definition, are herbicides that are applied prior to weed seed germination. Control of weeds using preemergence herbicides is most successful when the correct herbicide is applied in the correct manner to a weed-free growing medium prior to weed seed germination.

Preemergence Herbicide Application

In field or landscape situations, the soil should be freshly tilled and large clods of soil broken apart. Additionally, the growing medium, whether soil or soilless, should be settled and firm at the time of herbicide application to prevent the applied herbicide from channeling downward into the root zone of the crop. A couple of irrigation cycles or a good rainfall is often enough to settle the growing medium.

Herbicides should be applied uniformly to the target area and then immediately incorporated into the growing medium. Uniform herbicide coverage is dependent on good application technique and, for mechanized application, on well-maintained and calibrated equipment. Incorporation using water is generally employed to reduce herbicide losses from volatility (Table 1, Vapor pressure) and photodecomposition, but it also serves to activate some herbicides. Soon after the herbicide has been applied, about 0.5 inch (1.2 cm)

of water is applied using overhead irrigation for incorporation/activation. Herbicides can also be mechanically incorporated by mixing the herbicide into the top layer of the growing medium, generally to a depth of 1–3 inches (2.5–7.5 cm). Recommendations regarding the depth of mechanical incorporation and/or the amount of irrigation water to apply to activate/incorporate the herbicides should be followed carefully in order to minimize the possibility of crop injury. Read the product labels for specific incorporation instructions.

Preemergence Herbicide Formulations

Many of the preemergence herbicides used in ornamentals are formulated for application as **dry granules**. The active ingredient(s) is (are) carried on small, inert particles or pellets (clay, paper, sand, corn cob, etc.). These carrier particles typically have low concentrations ($\leq 10\%$) of herbicides and should be applied evenly over the treated area. The granules should not be applied to moist foliage or to whorled or other foliage types that will accumulate and trap the granules. Application equipment used to broadcast these formulations should not grind the granules or increase the amount of dust as this may generate potentially dangerous conditions to nearby plants and people. Whenever possible, use granular formulations that do not have extremely fine particles.

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Preemergence herbicides are also formulated as liquid solutions (aqueous solutions, AS; emulsifiable concentrates, E, EC; flowable solutions, F) and dry, water-soluble formulations (dry flowable, DF; dispersible granules, DG; water-dispersible granules, WDG; water-soluble bags, WSB; wettable powders, WP) for **spray applications**. Spray pressure should be constant and adequate to maintain proper spray pattern for uniformity and to ensure droplet penetration through the plant canopy. Excessive pressure can lead to drift and damage to nontarget plants. Spray volume should be sufficient for thorough coverage. Herbicides should be thoroughly mixed (agitated) in spray tanks to obtain uniform results, and spray nozzle openings (orifices) should be checked regularly and replaced when wear becomes evident. Spray adjuvants that enhance coverage, penetration, and/or persistence of herbicides can be added to some spray mixtures, especially if the mixtures are applied so that the crop foliage is not treated. Test spray solutions that contain any new adjuvant for phytotoxicity on a small part of your crop, just as you would test any new pesticide.

Chemigation

Chemigation is the least labor-intensive method for applying herbicides; however, few herbicides are labeled for application in this manner (Table 1, Labeled for chemigation). In addition, some types of irrigation systems (e.g., drip) do not apply water to all areas that need to be treated and/or do not have adequate uniformity for this use. Herbicide formulations applied through irrigation systems must not clog nozzle orifices. Florida and other states have laws that require safety equipment to be provided if chemicals are to be injected into irrigation systems. Some of the equipment necessary to prevent contamination of the water supply includes check valves, vacuum breakers, low-pressure drains, shutoff valves, remote chemical storage tanks, and interconnected power supplies to injector and irrigation pumps. Check with the agency that deals with pesticide compliance in your region for specific details and requirements.

Good Herbicide Practices

Liquid herbicides should be measured volumetrically (i.e., using measuring cups, graduated cylinders, etc.). Since dry pesticides vary in density, it is not possible to give accurate volumetric conversions across brands and formulations. Therefore, if a volumetric conversion for an herbicide is not listed on its label, those dry formulations must be weighed.

It is a good practice to keep records—including EPA registration and product lot numbers—of all pesticide applications, even of nonrestricted-use pesticides. These records can be useful for planning future weed control measures. In addition, they can be invaluable if crop damage occurs.

Regardless of the herbicide or application method used, it is strongly recommended that the effects be evaluated against untreated controls under your particular conditions before treating large areas. This is especially important when there is a statement on the label permitting use of the product on an ornamental not specifically listed on the label (Table 1, General crop labeling). Treat a limited area or number of plants and wait 2–3 weeks, or longer if the label recommends, for any phytotoxic effects to appear. Be aware that the larger the area treated, the more likely that phytotoxicity may occur, especially due to herbicide volatilization. Also, damage may not occur the first time an herbicide is applied, but it may show up with repeated applications. Several formulations of an herbicide may be available with varying concentrations; consequently, recommendations on the manufacturer's label should be followed explicitly. Note also that there may be limits on the amount of herbicide that can be applied at each application and additional restrictions on the total amount that can be applied to a given area in a year's time. Further, herbicide formulations are labeled for application in certain environments (outdoors, in shadehouses, and/or in greenhouses) and specific locations (container, field, and/or landscape) and can only be applied in those specified environments and locations.

Although most preemergence herbicides labeled for use in ornamentals have relatively low acute mammalian toxicities, they are potentially dangerous if handled improperly and, therefore, *the safety precautions on the label(s) must be followed*. Read the entire label, including the small print, before buying or using the herbicide. Wear personal protective equipment (PPE) and comply with restricted-entry intervals (REI) (Table 1, REI). Keep the telephone number and address of the nearest County Poison Control Center listed in a convenient location in case of an accidental poisoning. Have clean copies of herbicide labels and material safety data sheets (MSDS) available to be taken to the Poison Control Center or hospital in the event of an emergency. If an herbicide is labeled for use specifically in a particular state (for example, 24(c) Special Local Need labeling in Florida), obtain a copy of the supplemental label from the supplier when you purchase the product; otherwise, you will be using it illegally.

Herbicide Persistence and Movement

There are many processes affecting preemergence herbicide losses and movement in the environment. Volatilization, the vaporization of the active ingredient into the atmosphere, has already been mentioned. Breakdown of the active ingredients can occur by means of biological, chemical, and photodegradation processes. Removal of preemergence herbicides from the growing medium surface can reduce weed control. Downward movement of herbicides can lead to crop damage and has the potential to contaminate water resources. The main avenues by which properly applied herbicides may reach surface and ground waters are runoff and leaching. **Runoff** is the physical transport of herbicides over the ground surface by water that does not percolate down through the growing medium. The source of the water can be rain or irrigation. The herbicide may be in solution in the water and/or attached to organic matter carried along by the water to a surface water body. As more nurseries install tailwater recovery systems, the potential for runoff of herbicide-laden water to retention ponds is increased. When the stored water is later used for irrigation, it has the potential to cause crop damage. **Leaching** occurs when the herbicide moves down through the soil with water that is percolating. In many areas of Florida, soils are sandy and permeable, and leaching is likely to be a more serious problem than runoff. Fortunately, many of the preemergence herbicides labeled for use on ornamental crops have low solubilities in water and are quite strongly held to binding sites in growing media (see Sorption below); therefore, they are not readily leachable.

As relates to runoff and leaching, the fate of the herbicides applied to growing media depends largely on two of the herbicide's properties—sorption and persistence. **Sorption** is the process whereby the herbicides are bound to the growing medium. Depending on the herbicide's solubility, more or less of the herbicide will dissolve in the water held in the growing medium and be likely to leach. The growing medium organic matter content, temperature, pH, and moisture content can all affect the sorption/desorption process.

A useful index for quantifying herbicide sorption is the organic carbon partition coefficient, K_{oc} (Table 1). Herbicides with high K_{oc} values are typically not very water soluble and preferentially adhere to the growing medium rather than dissolve in water. Herbicides that are strongly bound to the growing medium are unlikely to be a problem because of leaching, unless they are very persistent (see **Persistence** below). However, if there is erosion of the growing

medium, the herbicide will move with medium particles. The California Department of Pesticide Regulation has determined that pesticides with K_{oc} values less than 1,900 have the potential to contaminate groundwater.

Nonetheless, as alluded to above, the relatively long **persistence** (long degradation half-lives, $T_{1/2}$) of some herbicides creates the potential for leaching losses to still occur with potential effects on groundwater. However, from a weed control standpoint, good preemergence herbicide persistence *at the surface of the growing medium* can be beneficial.

Herbicide Sites of Action and Weed Resistance Management

As an aid to help delay the selection of herbicide-resistant weeds, the herbicide group to which each product belongs is listed in Table 1. The groups are based on primary sites/modes of action (Mallory-Smith and Retzinger 2003) and can be used to select herbicides that have differing sites/modes of action. Repeated use of an herbicide or herbicides having the same sites of action can, over time, select for weeds resistant to those herbicides.

Herbicide Storage and Container Disposal

Store herbicides in their original labeled containers and out of reach of children. All pesticides should be locked in secure facilities. When containers are empty, rinse with water at least three times and pour the rinse water into the spray tank. Dispose of empty containers promptly and safely (according to local, state, and federal disposal laws).

Herbicide Efficacy Tables

In Table 2, weeds are listed alphabetically by scientific name along with the preemergence herbicides that control (C), suppress (S), or do not control (N) each weed. Table 3 is similar except that the weeds are listed alphabetically by common name(s). Unfortunately, common names can be misleading, and several weeds may have the same common name. It is important to correctly identify weeds since two very similar weeds may require completely different herbicides for effective control. The information in the efficacy tables is derived from product labels as well as published and unpublished research results. An herbicide may provide variable weed control depending on growing medium, irrigation, weed biotypes, and other variables. Where the weed entry in the tables lists only a genus, the labels must be checked to see which species in that genus are controlled by each herbicide.

Crop Herbicide Tolerance

Table 4 provides a guide to ornamentals' tolerances to preemergence herbicides, with the table subdivided into trees and shrubs, groundcovers, and vining plants, and annuals and perennials. The plants are listed alphabetically by scientific name. Information in Table 4 is derived from product labels and does not imply that an herbicide can be used in or around an ornamental species in all sites (nursery, landscape, greenhouse). The symbol "Y" indicates that the crop is listed for the common chemical name but may not be listed on all labels because of formulation differences. *Always read the labels for species/cultivar tolerance, special use, and injury instructions.* The symbol "N" indicates that the product should not be used on the crop. Please note that not all plant species and cultivars listed on the herbicide labels are included in the table, and some plants are listed in the table even though, at the current time, they are not listed on any of the herbicide labels. Hopefully, research and future label changes will help alter this situation for this latter group of plants.

Table 5 provides a reference of common names for the ornamentals presented by scientific name in Table 4. Readers should be aware that the same common name may be used for more than one plant (genus/species), so the true identity of the crop should be ascertained before herbicides are applied.

When selecting an herbicide, both factors listed below must be determined to legally use an herbicide in or around an ornamental species. The information below is on the product label:

1. Determine the tolerances of specific species, varieties, or cultivars, if applicable,

AND

2. Determine which sites the herbicide can be used on (i.e., nursery [container or field]; landscape [commercial, public, or residential]; open and enclosed shadehouses, and greenhouses).

Please report any errors, omissions, and/or updates to Bob Stamps (rstamps@ufl.edu).

Thank you.

References

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): 605–617.

Table 1. Preemergence herbicides labeled for ornamental crops listed by Weed Science Society of America (WSSA) site of action group number.

WSSA herbicide group ¹	Common name (active ingredient)	Trade name	Manufacturer or distributor	Labeled for chemigation	REI (hours) ²	Vapor pressure ³ (mPa)	K _{oc} ⁴ (mL/g)	T _{1/2} ⁵ (days)	General crop labeling ⁶
2	imazaquin	Image® 70DG	BASF	NO	12	0.003	20	60	NO
		Dacthal® 6F, 75WP	AMVAC Chemical	YES	12	0.333	5,000	80	NO
3	dithiopyr	Dimension® 1EC, 2EW, Ultra 40WP	Dow AgroScience	NO	12	0.533	1,638	23	YES
		Dithiopyr 40WSB	Quali-Pro	NO	12	0.533	1,638	23	YES
	oryzalin	Dynamo™ 40WSP	Etigra/NuFarm	na ⁷	24				NO
		Oryzalin 1.67CG	Loveland/Crop Protection Services	na ⁷	24				NO
	pendimethalin	Oryzalin 4 PRO	Quali-Pro	NO	24 ^{8,9}	<0.001	600	20	NO
		Surflan® 4AS, 5WDG	United Phosphorus	NO	24 ^{8,9}	<0.001	600	20	YES
	prodiamine	Corral™ 2.68G	Scotts	na	24	1.25	17,200	44	YES
		Pendulum® 2G	BASF	NO	24	1.25	17,200	44	YES
		Pendulum® 3.8AC	BASF	NO	24	1.25	17,200	44	YES
		Pin-dee™ 3.3EC	Drexel	NO	24	1.25	17,200	44	YES
trifluralin	Barricade® 4FL, 65WG	Syngenta	NO	12	0.003	13,000	69	NO	
	Cavalcade™ 65WDG	SipcamAdvan	NO	12	0.003	13,000	69	NO	
	ProClipse® 65WDG	Nufarm	YES	12	0.003	13,000	69	NO	
	Prodiamine 65WDG	Quali-Pro	na, NO	12	0.003	13,000	69	NO	
trifluralin	RegalKade® 0.5G, 65WDG	Regal Chemical	na	na	14.7	7,000	45	YES	
	Treflan 5G	Lebanon Seaboard	na	na	14.7	7,000	45	YES	
	Trifluralin 10G	Loveland/Crop Protection Services	na	12	14.7	7,000	45	YES	
		Trifluralin HF (4EC)	Loveland/Crop Protection Services	NO	12				

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5	simazine	Princep® 4L	Syngenta	NO	12	0.003	130	60	NO
		Simazine 4L	Drexel	YES/NO					
		Simazine 90DF	Drexel	NO					
		Sim-Trol® 4L, 90DF	SipcamAdvan	NO					
8	EPTC	Eptam® 7E	Gowan	YES	12	4,530	200	6	NO
		BroadStar™ 0.25G	Valent USA	na	12	0.321	191	15	YES
flumioxazin	SureGuard™ 51WDG	Valent USA	NO	Limited ¹⁰					
14	oxadiazon	Oxadiazon 2G	Quali-Pro	na	12	0.103	3,200	60	NO
		Oxadiazon 50WSB	Quali-Pro	NO					
		Ronstar® 2G	Bayer CropScience	na					
		Ronstar® 3.17F, 50WSP	Bayer CropScience	NO					
15	oxyfluorfen	Galligan® 2E	MANA	NO ¹¹	24 ¹²	0.267	100,000	35	NO
		Goal® 2XL(EC)	Dow AgroSciences		12	36.8	125	20	YES
		Tower® 6EC	BASF	NO					
		Devrinol® 50DF	United Phosphorus	NO	12	700	70	NO	
20	propyzamide = pronamide	Kerb® 50WP ¹³	Dow AgroSciences	NO	24	11.3	800	60	NO
		Pennant Magnum® 7.6EC	Syngenta	YES	24	4.2	75	60	YES
		Barrier® 4G	PBI/Gordon	na	nd ¹⁴	133	400	60	NO
21	isoxaben	Casoron® 4G	OHP	na	12	0.051	380	85	NO
3 + 3	benefin + oryzalin	Gallery® 75DF	Dow AgroSciences	NO	24	10.37 + <0.001	† ¹⁵	†	YES
3 + 15	pendimethalin + dimethenamid-P	XL® 2G	Helena Chemical	na	24	36.8 + 1.25	†	†	YES
		FreeHand™ 1.75G	BASF	na	24				YES

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3 + 21	trifluralin + isoxaben	Preen® Plus 1.875G	Lebanon Seaboard	na					NO	
		Quali-Pro T/1 2.5G	Quali-Pro	na	12	14.7 + 0.051	†	†	NO	
		Snapshot® 2.5TG	Dow AgroSciences	na					NO	
14 + 3	oxadiazon + pendimethalin	Jewel™ 3.25G	Scotts	na	12	0.103 + 1.25	†	†	YES	
		RegalStar® II, 1.2G	Regal Chemical	na	12	0.10 + 0.003	†	†	NO	
	oxyfluorfen + prodiamine	Double O E-Pro 3G	Etigra/NuFarm	na	24	0.267 + <0.001	†	†	YES	
			Scotts	na					YES	
	oxyfluorfen + pendimethalin	OH2® 3G	Scotts	na	24	0.267 + 1.25	†	†	YES	
			OHP	na	24	0.267 + 0.003	†	†	YES	
	14 + 14	oxyfluorfen + trifluralin	Granular Herbicide 75-5G	Harrell's	na	24	0.267 + 14.7	†	†	YES
			OO-Herbicide™ 3G	Regal Chemical	na	24	0.267 + 0.103	†	†	NO
			Two OX E-Pro 3G	Etigra/NuFarm	na					YES
	15 + 14	napropamide + oxadiazon	PrePail® 6G	Loveland/Crop Protection Services	na	12	0.61 + 0.103	†	†	YES
Showcase™ 2.5G			Dow AgroSciences	na	24	14.7 + 0.051 + 0.267	†	†	YES	

¹ Herbicide groups are based according to primary sites of action (*Weed Technology* 17:605–619, [2003]) and can be used to select herbicides that have differing sites of action. This information can be used to help select herbicides so as to minimize the potential for the development of herbicide-resistant weeds. 2 = ALS/AHAS inhibitors, 3 = microtubule assembly inhibitors, 5 = photosystem II inhibitors, 8 = lipid synthesis inhibitors, 14 = PPO inhibitors, 15 = very long-chain fatty acids synthesis inhibitors, 20 = cellulose synthase inhibitors, 21 = inhibition of cell wall synthesis site B.

² Restricted entry interval.

³ Vapor pressure at 77°F (25°C); the smaller the value, the less quickly the active ingredient will volatilize (vaporize) and be released into the atmosphere.

⁴ K_{oc} = average partition coefficient normalized to organic carbon. This is the ratio of the herbicide concentration bound to the soil and dissolved in the soil water. The larger the K_{oc} value, the lower the concentration of the herbicide dissolved in the soil water and less likely the herbicide will leach. See *Behavior of Pesticides in Soils and Water* (University of Florida, Institute of Food and Agricultural Sciences, Cooperative Extension Service, Soil and Water Science Department Fact Sheet SL 40, available at <http://edis.ifas.ufl.edu>) for more details. Sources of the K_{oc} values are the *Herbicide Handbook*, 9th edition, Weed Science Society of America and/or information provided by the herbicide company.

⁵ $T_{1/2}$ = field degradation half-life. This is the approximate length of time it takes for one half of the herbicide to be deactivated in the soil and is an indicator of the persistence of the herbicide. The lower the number, the less likely for herbicide movement and the shorter the duration of weed control. See *Behavior of Pesticides in Soils and Water* (University of Florida, Institute of Food and Agricultural Sciences, Cooperative Extension Service, Soil and Water Science Department Fact Sheet SL 40, available at <http://edis.ifas.ufl.edu>) for more details. Sources of the $T_{1/2}$ values are the *Herbicide Handbook*, 9th edition, Weed Science Society of America and/or information provided by the herbicide company.

⁶ The product can be applied to plants not specifically listed on the label. However, the user should first confirm the product's safety on a small number of plants grown under typical conditions BEFORE using the product on a wide scale commercial basis. In addition, the user assumes responsibility for any damage that results from the use of the product to non-listed plants.

⁷ na = not applicable.

⁸ Exception: If the product is soil-injected or soil incorporated, the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated.

⁹ Workers may enter treated areas without required PPE during the reentry interval following 1/2 to 1 inch of rainfall or irrigation, if they are performing tasks that do not involve contact with the soil subsurface.

¹⁰ Deciduous tree species only.

¹¹ Except conifer seedbeds irrigated with center pivot sprinkler irrigation.

¹² Except for conifer seedlings (REI = 3 days) and conifer trees (REI = 6 days); see Agricultural Use Requirements section on label for all REI requirements.

¹³ Kerb® is a restricted-use pesticide.

¹⁴ nd = no data.

¹⁵† See individual active ingredient listings for values.

Table 2. Weeds, listed alphabetically by scientific name, and their susceptibilities to preemergence herbicides labeled for use on ornamental crops (N = no/poor control, S = suppression, C = good control).

Weed Scientific Name	Bialthion®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®							
<i>Amaranthus</i> spp. ¹³	C	C	S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C						
<i>Ambrosia rtemisiifolia</i>		S	N	S-C	C			C	C	C			N		S	C	S			N	C	S	C	C	C	N	C	C	C	S	C						
<i>Anthemis cotula</i>		C					C	C	C	C							C							C													
<i>Bidens bipinnata</i>					C																																
<i>Brassica</i> spp. ¹³		- ¹⁴ /C	N	S	C	C			C	C			C		S	C	C	C						C							S	C					
<i>Bryum</i> spp.		C														C	C	C																			
<i>Capsella bursa-pastoris</i>	C	C	S	C	C	C			C	C		C	C	C	C	C	S-C	C	C			C	C	C	C	C	C	C	C	C	C	C	C	C			
<i>Cardamine</i> spp. ¹³	C	C	N	S	C	S-C			C	C	C	C	C	C	C	C	C	C	C			S-C	C	C	S-C	C	S	S	S-C	S	S	S	S	S	S		
<i>Cerastium vulgatum</i>		C		N	C				C	C	C		C		N							C			N												
<i>Chamaesyce hirta</i> (synonym <i>Euphorbia hirta</i>)	C	C				C		C					N	C			C ¹⁶	C	C			C															
<i>C. humistrata</i> (synonym <i>Euphorbia humistrata</i>)		C	S	N	C	C			C	C			N	C	S-C	N	C	C	C			C	S	C	S												
<i>C. hyssopifolia</i> (synonym <i>Euphorbia hyssopifolia</i>)		C							C				C	C	S		C	C				C															
<i>C. maculata</i> , (synonym <i>E. maculata</i> , <i>E. supina</i>)	C	C	S	N	C	S-C			N-S	C		S-C	N	C	S-C	S-C	C	S-C	S-C			C	C	C	S	C	N	C	S	S	S	S	S	S	S	S	S

Table 2. Weeds, listed alphabetically by scientific name, and their susceptibilities to preemergence herbicides labeled for use on ornamental crops (N = no/poor control, S = suppression, C = good control).

Weed Scientific Name	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil®	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyflufen ⁵	oxyflufen + oryzalin ⁶	oxyflufen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®						
<i>C. vermiculata</i> , (synonym <i>Euphorbia vermiculata</i>)								C					N					C																		
<i>Chenopodium</i> spp. ¹³		C	C	C	C		C	C	C	C		C	C		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				
<i>Commelina benghalensis</i>	S	C ¹⁵			S	S		C	N			S	C ¹⁵	C ¹⁵				C ¹⁵		C		S		S		C			N							
<i>Cuscuta</i> spp. ¹³			C		C				N				C		N-S				S-C	C		C					S									
<i>Cyperus compressus</i>									N		S	C				C						C														
<i>C. croceus</i> (synonym <i>C. globulosus</i>)								C			C															S-C										
<i>C. esculentus</i>	N		N	S	C		C	C	N		S-C		N	N	N	N	N	N		N	C	N	N			N	C	N								
<i>C. rotundus</i>			N				C				S-C																									
<i>Daucus carota</i>					N				C						N									C										S-C		
<i>Desmodium tortuosum</i>		C																								S										
<i>Digitaria</i> spp. ¹³	C	C	C	C	C	C	C	C	N-S	C	S	C	C	C	C	S-C	S-C	C	C	C	C	C	C	C	C	N-S	C	C	C	C	C	C	C	C	C	
<i>Eclipta</i> spp. ¹³	N-C	C				N-S		N-C	C		C	S		N-C	S	N		C		N-S	S				S-C	N-S									S-C	
<i>Eleusine indica</i>	C	C	S	C		C	C	C	N	C		C	C	C	C	S-C	S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
<i>Emilia fosbergii</i>		C				N		S				N				N		S																		C

Table 2. Weeds, listed alphabetically by scientific name, and their susceptibilities to preemergence herbicides labeled for use on ornamental crops (N = no/ poor control, S = suppression, C = good control).

Weed Scientific Name	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyflufen ⁵	oxyflufen + oryzalin ⁶	oxyflufen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®			
	<i>Eupatorium capillifolium</i>	C	C	C	C		C	C	C					C	C	S		C	C	N			S ³		C	C				C			
<i>Euphorbia heterophylla</i>		- ¹⁴ /C															C																
<i>E. hirta</i> (see <i>Chamaesyce hirta</i>)																																	
<i>E. humistrata</i> (see <i>C. humistrata</i>)																																	
<i>E. maculata</i> , <i>E. supina</i> (see <i>C. maculata</i>)																																	
<i>E. vermiculata</i> (see <i>C. vermiculata</i>)																																	
<i>Fatoua villosa</i>	S-C	C				N-S	C	C	S			C		C		C		C	C	C	S-C	C	S							S-C	S-C		
<i>Galium aparine</i>										C					S									C			N						
<i>Gamochaeta</i> spp. ¹³		C		S		C			C	C		S			C	N-C	C	C	C	C	C			C	C	C			S	C	C		
<i>Geranium carolinianum</i>		C		C	C	C			C		C				C		Cl ¹⁶							C	S					C			
<i>Gnaphalium</i> spp. ¹³ (see <i>Gamochaeta</i> spp. ¹³)																																	
<i>Heterotheca subaxillaris</i>					C												C								C								
<i>Ipomoea</i> spp. ¹³													C		S		S															S	
<i>Isopterygium albesceus</i>															C			C															
<i>Kyllinga brevifolia</i>		C	C			S-C	S	C	S-C				S		S	C				S	S-C									S-C		C	
<i>Lamium amplexicaule</i>			N-S	C	C	C	C	C	C		C		C		C		C			C		C			C	C				C	C	C	

Table 2. Weeds, listed alphabetically by scientific name, and their susceptibilities to preemergence herbicides labeled for use on ornamental crops (N = no/poor control, S = suppression, C = good control).

Weed Scientific Name	Biallon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	prodiamine ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	Xl®					
<i>Lepidium</i> spp. ¹³	C			C	C			C	C	C			C	C	C	S	C		C	C					C						C				
<i>Marchantia polymorpha</i>		C		N	N			C	N					S		S	N	C	C	N		C			N										
<i>Medicago lupulina</i>						C			C		C									S-C															
<i>Mollugo verticillata</i>		C		C	C	C		C	S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
<i>Murdannia nudiflora</i>		C				N		C	N					N-S	N	N		N	N	N	C					C									
<i>Oenothera</i> spp. ¹³				N	C			C	S-C		C			C	C	S	C ¹⁶	C	C	C	S	C	N	N	C	C									
<i>Oxalis corniculata</i> (synonym <i>O. stricta</i>)	C	C		N	C			C	C	C	C	C	C	C	C	C	C	C	C	C	N-S	C	C	C	C	N-S	S								
<i>Parthenium hysterophorus</i>	C	C				N		S-C	C			N		C	S	S-C		C		S			N	C	C	S									
<i>Phyllanthus tenellus</i>		C				N		C	N-S			C		C		C		C	C	S-C			S-C	S-C	C										
<i>P. urinaria</i>									N-S			C		S	S	S		S	S		N		S-C	S-C	C										
<i>Pilea microphylla</i>																C		C																	
<i>Poa annua</i>	C	C		C	C	C		C	N	C	S		C	C	C	C	S	C	C	C	C	C			C										
<i>Portulaca oleracea</i>		C		C	C	C		C	C	C		C	C	C	C	C	C	C	C	C	S	C	C	C	C	C	C	C	C	C	C	C	C	C	
<i>Richardia scabra</i>		C		C	C			C	S	C					C					C	C														

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Table 2. Weeds, listed alphabetically by scientific name, and their susceptibilities to preemergence herbicides labeled for use on ornamental crops (N = no/ poor control, S = suppression, C = good control).

Weed Scientific Name	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®			
<i>Senecio vulgaris</i>	S	C					C					C		S		S	S	S	S					C	C								
<i>Solanum</i> spp. ¹³		C	S	N	C		C	C	C	C			C		S		C			N	C			C	S-C	S						S	
<i>Sonchus</i> spp. ¹³	C	C	S	C	C		C	C	C	C		C		C	S	C	C	C	C			C		C	S							S	
<i>Stachys floridana</i>					C																N												
<i>Stellaria media</i>	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N	S	C	C		N-S	C	C	C	C	C							C
<i>Vicia sativa</i>																				S					S								

¹ Barrier®, Casoron® — dichlobenil is highly volatile and, therefore, has the potential to be phytotoxic. Use with caution, avoid situations where gaseous concentrations can build up, apply when temperatures are low (volatility increases with increasing temperature), and incorporate immediately after application.

² Dimension®, Dithiopyr, Dynamo™

³ Oryzalin, Surflan®

⁴ Oxadiazon, Ronstar®

⁵ Galigan®, Goal®

⁶ Double O E-Pro, Rout®

⁷ O-O Herbicide™, Two OX E-Pro

⁸ Corral™, Pendulum®, Pin-dee™

⁹ Barricade®, Cavalcade™, ProClipse™, RegalKade®

¹⁰ Princep®, Simazine, Sim-Trol®

¹¹ Treflan®, Trifluralin

¹² Preen® Plus, Quali-Pro® T/1, Snapshot™ TG

¹³ Check product labels for species controlled.

¹⁴ – = weed not on the label of this formulation.

¹⁵ May not control seedlings produced from seed of underground flowers.

¹⁶ Not all formulations of this active ingredient are labeled to control this weed(s).

Table 3. Weeds, listed alphabetically by common name, and their susceptibilities to preemergence herbicides labeled for use on ornamental crops (N = no/poor control, S = suppression, C = good control).

Weed Common Name	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	prodiamine ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²			
artilleryweed																		C														
bed straw, catchweed										C				S											C		N					
beggartweed, Florida		C																								S						
betony, Florida				C																												
bittercress ¹³	C	C	N	C	C	S-C		N-C	C	C	C	C		C	C	C	C	C	C	S		S-C	C	C		C	S	S-C	S-C			
bluegrass, annual	C	C		C	C	C	C	C	N	C	S		C	C	C	C	S	C	C	C	C	C	C	C			C	C	C			
camphorweed					C												C															
carpetweed		C	C	C	C	C	C	C	S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C	C	S	S	C		
carrot, wild				N	C				C						N									C						C		
chamberbitter												C		S	S	S		S	S		N	S-C	C	C			N	N-C	N-C			
chamomile, stinking		C								C							C									C				C		
chickweed, common	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N	S	C	C	C	N-S	C	C	C	C		C	C	C	C	C	
chickweed, mouseear		C		N	C			C	C		C		C		N					C			C	C	N					C	C	
crabgrass	C	C	C	C	C	C	C	C	N-S	C	S	C	C	C	C	S-C	S-C	C	C	C	C	C	C	C						C	C	C
crabweed, hairy	S-C	C				N-S		C	S					C		C		C	C	S	S-C	C	C							S-C	S-C	S-C
cudweed	C		S		C			C	C		S			C	N-C	C		C	C	C				C				S		C	C	

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Weed Common Name	Biathlon®	BroadStar™/SureGuard™	Dachal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²
Cupid's-shaving-brush		C				N	S	S				N				N		S						S-C					C
dayflower, Bengal	S	C ¹⁴				S	C	C	N			S		C ¹⁴				C ¹⁴			C			S		C			N
dayflower, spreading																						C							
dodder			C		C								C		N-S				S-C		C						S		
dogfennel		C			C		C	C						C		S		C		N		S						C	
doveweed		C				N	C	C	N					N	N-S	N		N		N	C					C		N	
eclipta	N-C	C				N-S	N-C	N-C	C			S		N-C	S	N		C		N-S	S			S-C		N-S	N	S-C	
evening primrose				N	C		C	C	S-C					C		S	C ¹⁵	C		C	S								C
geranium, Carolina		C		C	C	C			C		C				C		C ¹⁵							C					C
goosegrass	C	C	S	C		C	C	C	N	C		C	C	C	C	S-C	S	C	C	C	S-C								C
groundsel, common	S	C							C			C		S		S	S	S											C
henbit				N-S	C	C	C	C	C		C		C		C		C		C										C
kyllinga, green		C	C			S-C	S	C	S-C				S		S				S		S-C								C
lambquarters ¹³		C	C	C	C		C	C	C	C		C	C		C	C	C	C		C	S								C
liverwort, common		C			N			C	N					S		S	N	C	C	N									C

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Weed Common Name	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²		
mayweed		C						C	C	C							C							C					C		
medic, black						C			C		C		C						S-C					C					C		
morning glory															S																
moss ¹³		C																													
mulberry weed	S-C	C				N-S		C	S			C		C		C		C	C	S	S-C	C							S-C		
mustard ¹³		- ¹⁶ /C	N	S	C	C			C	C			C		S	C	C	C			N			C					C		
nightshade, black		C	S	N	C		C	C	C	C			C		S		C		N		C										
nutsedge, purple	N		N				C				S-C																				
nutsedge, yellow	N		N	S	C		C	C	N		S-C		N		N	N	N	N			C				N	C	N				
parthenium weed		C				N		S-C	C			N		C	S	S-C		C		S				C					S-C		
pepperweed ¹³	C			C	C			C	C	C			C	C	C	S	C		C					C					C		
phyllanthus, long-stalked		C				N			N-S			C		C		C		C	C	S-C	S-C									N-C	
pigweeds ¹³	C	C	S	C	C	C	C	C	C	C	C	C		C	C	C	C	C	C					C						C	
poinsettia, wild		- ¹⁶ /C																													
purslane, common	C	C	C	C	C	C	C	C	C	C		C	C	C	C	C	C	C	C		S			C						C	
pusley, Florida	C	C	C	N	C		C	C	S	C					C						C			S	C	C	C	S	C	C	
ragweed, common	S	N	N	S-C	C		C	C	C				N		S	C	S			N	S	C		C						S	
sedge, annual									N		S	C				C															
sedge, globe								C			C					C														S-C	

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Weed Common Name	Biaithlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®				
shepherdspurse	C	C	S	C	C	C	C	C	C	C	C	C	C	C	C	C	S-C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
sowthistle	C	C	S	C	C	C	C	C	C	C	C	C	C	C	S	C	C	C	C	C	C	C	C	C	S	C	C	C	C	S	C			
Spanish needles					C																	N			C			S-C						
spurge, garden	C	C	C			C	C	C					N	C			C ¹⁷	C	C		C													
spurge, hairy							C						N					C									C	C						
spurge, hyssop	C	C					C	C	C						S			C	C	C		C												
spurge, prostrate	C	C	S	N	C	C	C	C	C	C			N	C	S-C	N	C	C	C	C	S	C	S	C	S	C	C	C	C	S-C	S	S-C		
spurge, spotted	C	C	S	N	C	S-C	C	C	N-C	C		S-C	N	C	S-C	S-C	C	S-C	S-C	C	S		C	S	C	C	N	S-C	S	S	S	S		
ticktrefoil, Dixie	C																																	
vetch, common																				S		S			S									
woodsorrel, yellow	C	C	C	N	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	N-S	C	C	C	C	N-S	S	C	C	C	C	C	C	

¹ Barrier®, Casoron® — dichlobenil is highly volatile and, therefore, has the potential to be phytotoxic. Use with caution, avoid situations where gaseous concentrations can build up, apply when temperatures are low (volatility increases with increasing temperature), and incorporate immediately after application.

² Dimension®, Dithiopyr, Dynamo™

³ Oryzalin, Surflan®

⁴ Oxadiazon, Ronstar®

⁵ Galigan®, Goal®

⁶ Double O E-Pro, Rout®

⁷ O-O Herbicide™, Two OX E-Pro

⁸ Corral™, Pendulum®, Pin-dee™

⁹ Barricade®, Cavalcade™, ProClipse™, Regalkade®

¹⁰ Princep®, Simazine, Sim-Trol®

¹¹ Treflan®, Trifluralin

¹² Preen® Plus, Quali-Pro® T/I, Snapshot™ TG

¹³ Check product labels for genera and/or species.

¹⁴ May not control seedlings produced from seed of underground flowers.

¹⁵ Not all formulations of this active ingredient are labeled to control this weed(s).

¹⁶ – = weed not on the label of this formulation.

Table 4. Ornamentals tolerant of some preemergence herbicides (Y = crop is listed for common chemical name, but may not be listed on all labels due to formulation differences, N = do not use product on indicated genus, species or hybrid). Always read the label for species/cultivar tolerance, special use, and injury instruction.

Scientific name or label designation	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil¹	dithiopyr²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin³	oxadiazon⁴	oxyfluorfen⁵	oxyfluorfen + oryzalin⁶	oxyfluorfen + xadiazon⁷	pendimethalin⁸	Pennant Magnum®	PrePair®	proflamime⁹	RegalStar® II	Showcase™	simazine¹⁰	Tower™	trifluralin¹¹	trifluralin + isoxaben¹²	XLR®					
Trees and Shrubs																																			
<i>Abelia × grandiflora</i>	Y ¹³	Y/- ¹⁴	Y	Y ¹⁵		Y		Y	Y	Y	N			Y	Y			Y	Y	Y		Y					Y	Y	Y	Y	Y				
<i>Abies balsamea</i>		Y/-		Y				Y	Y	Y					Y					Y							Y	Y	Y	Y	Y	Y			
<i>A. concolor</i>		-/Y				Y			Y						Y					Y												Y			
<i>A. fraseri</i>		Y/Y				Y	Y ¹³	Y					Y ¹³		Y	Y ¹³				Y		Y				Y						Y			
<i>Abies</i> spp. (fir)			Y	Y ¹³					Y ¹³				Y ¹³	Y		Y ¹³		Y								Y ¹³	Y ¹³	Y ¹³				Y ¹³			
<i>Acacia</i> spp.		Y/-							Y	Y						Y		Y														Y			
<i>Acalypha wilkesiana</i>																																			
<i>Acca sellowiana</i> (synonym <i>Feijoa sellowiana</i>)						Y			Y	Y							Y ¹³																		
<i>Acer ginnala</i>		Y/-							Y	Y																									
<i>A. palmatum</i>		Y/-		Y		Y		Y		Y						Y																			
<i>A. pensylvanicum</i>		Y/-																																	
<i>A. rubrum</i>		Y/-		Y		Y		Y	Y	Y						Y																			
<i>A. saccharinum</i>						Y			Y	Y						Y																			
<i>A. saccharum</i>						Y			Y	Y						Y																			
<i>Acer</i> spp.		-/Y	Y	Y	Y	Y ¹³	Y ¹³			Y		Y	Y	Y	Y	Y	Y																		
<i>Aesculus pavia</i>			Y																																

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Trees and Shrubs																																		
<i>Afrocarpus gracilior</i> (synonym <i>Podocarpus gracilior</i>)																		Y														Y		
<i>Allamanda cathartica</i>														Y																				
<i>Araucaria heterophylla</i>								Y					Y						Y															
<i>Arecastrum romanzoffianum</i> (see <i>Syagrus romanzoffiana</i>)																																		
<i>Astilbe</i> spp.								Y							Y																		Y ¹³	
<i>Aucuba japonica</i>			Y	Y ¹⁵																Y		Y											Y ¹³	
<i>Banksia menziesii</i>																		Y																
<i>Bauhinia galpinii</i>									Y																									
<i>Berberis julianae</i>																																		
<i>B. thunbergii</i>			Y			Y			Y	Y					Y	Y ¹³		Y ¹³		Y		Y		Y		Y							Y ¹³	
<i>Berberis x gladwynensis</i>																																		
<i>Berberis</i> spp.		Y/-			Y	Y ¹³	Y ¹³		Y ¹³			Y	Y	Y		Y ¹³		Y	Y		Y	Y	Y	Y	Y									Y ¹³
<i>Betula nigra</i>			Y		Y	Y			Y	Y			Y	Y			Y	Y																Y
<i>Betula</i> spp.		Y/Y		Y	Y ¹⁵								Y																					
<i>Bougainvillea</i> spp.				Y				Y ¹³		Y					Y ¹³			Y																Y ¹³

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<i>Buddleja davidii</i>	Y ¹³						Y ¹³															Y																											
<i>Buddleja</i> spp.		Y/-					Y ¹³				Y																																						
<i>Bucida buceras</i>									Y	Y					Y ¹³																																		
<i>Buxus microphylla</i>									Y	Y					Y																																		
<i>Buxus</i> spp.	Y ¹³	Y/-	Y	Y	Y	Y ¹³	Y ¹³		Y ¹³	Y	Y				Y ¹³	Y ¹³					Y ¹³																												
<i>Callistemon citrinus</i>			Y	Y	Y	Y			Y	Y					Y	Y ¹³																																	
<i>C. viminalis</i>				Y	Y				Y	Y																																							
<i>Callistemon</i> spp.		Y/-		Y	Y																																												
<i>Camellia japonica</i>						Y ¹³		Y	Y	Y						Y																																	
<i>C. sasanqua</i>						Y		Y		Y						Y																																	
<i>Camellia</i> spp.		Y/-	Y	Y	Y		Y ¹³				Y																																						
<i>Carissamacrocarpa</i> (synonym <i>C. grandiflora</i>)				Y												Y																																	
<i>Carya</i> spp.		Y ¹³ /Y													Y ¹³																																		
<i>Caryota</i> spp.																																																	
<i>Castanea mollissima</i>										Y																																							
<i>Castanea</i> spp.		Y/Y																																															
<i>Cercis canadensis</i>		Y/Y	Y					Y	Y	Y																																							

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<i>Chamaecyparis lawsoniana</i>						Y		Y		Y				Y	Y	Y ¹³		Y									Y			Y											
<i>C. obtusa</i>						Y		Y	Y	Y				Y	Y	Y ¹³		Y						Y		Y	Y														
<i>C. pisifera</i>						Y		Y	Y	Y				Y	Y	Y ¹³		Y		Y				Y		Y	Y														
<i>Chamaecyparis</i> spp.		Y/-	Y	Y										Y			Y ¹³	Y			Y																				
<i>Chamaedorea cataractarum</i>								Y		Y													Y																		
<i>C. elegans</i>								Y	Y	Y				Y	Y			Y				Y		Y																	
<i>C. erumpens</i>																						Y		Y																	
<i>Chamaedorea</i> spp.		Y/-																																							
<i>Chamaerops humilis</i>									Y																																
<i>Chrysalidocarpus lutescens</i>									Y					Y	Y																										
<i>Citrus</i> spp.		Y/Y	Y	Y			Y ¹³							Y	Y ¹³	Y ¹³	Y ¹³				Y	Y																			
<i>Cleyera japonica</i>		N/-			Y				Y	Y					Y	Y																									
<i>Codiaeum variegatum</i>																		Y																							
<i>Cornus florida</i>		Y/-	Y	Y ¹⁵	Y ¹⁵	Y			Y	Y			Y	Y	Y		Y																								
<i>C. kousa</i>			Y	Y ¹⁵	Y ¹⁵				Y	Y			Y	Y	Y																										
<i>C. stolonifera</i>			Y	Y ¹⁵	Y ¹⁵					Y			Y	Y	Y																										

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<i>Cornus</i> spp.		Y/-	Y	Y	Y	Y ¹³	Y ¹³	Y				Y	Y ¹³			Y ¹³			Y ¹³	Y																														
<i>Cotoneaster apiculatus</i>			Y	Y	Y	Y	Y	Y	Y						Y				Y ¹³	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y																		
<i>Cotoneaster</i> spp.	Y ¹³	Y/-	Y	Y	Y	Y		Y ¹³	Y ¹³				Y	Y	Y ¹³	Y		Y ¹³	Y	Y	Y ¹³	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y																	
<i>× Cupressocyparis leylandii</i>			Y	Y	Y	Y		Y	Y			Y				Y				Y													Y																	
<i>Cupressus arizonica</i>									Y	Y					Y									Y									Y																	
<i>C. glabra</i> (see <i>C. arizonica</i>)																																																		
<i>C. sempervirens</i>		Y/-				Y			Y						Y			Y																																
<i>Cupressus</i> spp.			Y	Y	Y ¹³				Y ¹³					Y	Y ¹³	Y			Y									Y ¹³	Y ¹³	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y											
<i>Cycas revoluta</i>						Y			Y	Y																																								
<i>Deutzia gracilis</i>	Y ¹³	N/-							Y			Y			N	Y																									N									
<i>Deutzia</i> spp.			Y	Y	Y				Y ¹³	Y			Y ¹³			Y ¹³			Y																							Y ¹³								
<i>Elaeagnus angustifolia</i>					Y				Y	Y					Y	Y	Y									Y																			Y					
<i>E. pungens</i>			Y						Y	Y								Y ¹³																																
<i>Elaeagnus</i> spp.		Y/-																																																
<i>Eriobotrya japonica</i>																		Y ¹³	Y																															
<i>Escallonia</i> spp.	Y ¹³							Y				Y	Y																																					
<i>Eucalyptus camaldulensis</i>		Y/-								Y					Y		Y																																	

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Trees and Shrubs																																			
<i>E. cinerea</i>		Y/-						Y	Y	Y					Y										Y		Y	Y	Y	Y					
<i>E. citriodora</i>					Y																														
<i>Eucalyptus</i> spp.		-/Y	Y					Y ¹³	Y ¹³						Y ¹³						Y				Y		Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³				
<i>Euonymus alatus</i>									N																										
<i>E. fortunei</i>						Y ¹³		Y ¹³	Y ¹³	Y					Y ¹³	Y ¹³		Y ¹³	Y ¹³	Y	Y	Y	Y ¹³	Y		Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³				
<i>E. japonica</i>	Y ¹³							Y ¹³	Y ¹³	Y					Y ¹³	Y ¹³		Y ¹³	Y ¹³							Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³			
<i>E. kiautschovicus</i>									Y	Y					Y	Y ¹³		Y ¹³	Y ¹³								Y	Y	Y	Y	Y	Y			
<i>Euonymus</i> spp.		Y ¹³ /-	Y	Y	Y		Y ¹³	Y	Y ¹³			Y	Y ¹⁵	Y ¹³	Y ¹³	Y ¹³		Y ¹³	Y ¹³	Y											Y	Y			
× <i>Fatschedera lizei</i>															Y																				
<i>Fatsia japonica</i>								Y	Y						Y ¹³	Y ¹³				Y															
<i>Feijoa sellowiana</i> (see <i>Acca sellowiana</i>)																																			
<i>Ficus benjamina</i>		Y/-						Y	Y	Y					Y			Y									Y					Y	Y		
<i>F. lyrata</i>															Y		Y	Y																	
<i>Ficus</i> spp.			Y ¹³												Y ¹³		Y ¹³	Y ¹³		Y															
<i>Forsythia</i> × <i>intermedia</i>						Y		Y	Y			Y			Y	Y		Y ¹³	Y																
<i>F. suspensa</i>		Y/-																																	
<i>Forsythia</i> spp.			Y	Y	Y					Y			Y						Y																
<i>Fraxinus americana</i>		Y/-				Y				Y									Y																
<i>F. pennsylvanica</i>		Y/-				Y													Y																

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<i>Gardenia jasminoides</i>	Y ¹³					Y		Y	Y	Y	Y	Y			Y	Y		Y		Y		Y	Y				Y	Y	Y	Y	Y								
<i>Gardenia</i> spp.	Y ¹³	Y/-		Y	Y								Y						Y ¹³	Y	Y					Y	Y												
<i>Ginkgo biloba</i>		Y/Y							Y	Y	Y	Y			Y	Y				Y						Y	Y												
<i>Hibiscus rosa-sinensis</i>				Y ¹⁵	Y	Y			Y	Y	Y	Y			Y	Y		Y ¹³		Y	Y	Y	Y	Y		Y	Y												
<i>H. syriacus</i>	Y ¹³			Y ¹⁵	Y ¹³	Y ¹³		Y	Y	Y	Y				Y	Y ¹³			Y	Y	Y ¹³	Y	Y	Y		Y	Y												
<i>Hydrangea macrophylla</i>							Y ¹³													Y		Y				Y													
<i>Ilex</i> × <i>attenuata</i>	N	N/-	Y					N	N				Y					Y ¹³	Y	Y					Y														
<i>Ilex attenuata</i> 'Savannah'						Y			Y ¹³											Y					Y														
<i>I. cornuta</i>	Y					Y		Y	Y ¹³		Y ¹³				Y ¹³			Y ¹³		Y					Y														
<i>I. crenata</i>		N ¹³ /-			N	Y		Y	Y ¹³		Y ¹³				Y ¹³			Y ¹³		Y				Y															
<i>I. glabra</i>									Y ¹³						Y ¹³																								
<i>I. opaca</i>							Y																																
<i>I. vomitoria</i>					N	Y			Y ¹³		Y ¹³				Y ¹³			Y		Y				Y															
<i>Ilex</i> × 'Nellie Stevens'					Y	Y														Y					Y														
<i>Ilex</i> spp.	Y ¹³	Y/-	Y	Y	Y ¹³	Y ¹³	Y ¹³	Y	Y ¹³	Y		Y	Y	Y	Y ¹³	Y ¹³			Y ¹³	Y	Y	Y ¹³	Y ¹³	Y	Y	Y													
<i>Illicium anisatum</i>									Y	Y											Y																		
<i>I. floridanum</i>		Y/-						Y	Y	Y											Y																		

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<i>I. parviflorum</i>	Y																			Y													
<i>Itea ilicifolia</i>		Y ¹³ /-						Y	Y	Y																Y	Y						
<i>Ixora coccinea</i>									Y	Y	Y															Y	Y						
<i>Juniperus chinensis</i>	Y ¹³	-/Y			Y ¹³				Y ¹³		Y ¹³				Y		Y	Y ¹³		Y			Y					Y ¹³	Y ¹³				
<i>J. conferta</i>	Y ¹³								Y ¹³		Y ¹³				Y		Y	Y ¹³		Y			Y					Y ¹³	Y ¹³				
<i>J. horizontalis</i>	Y	-/Y			Y ¹³				Y ¹³		Y ¹³				Y		Y	Y ¹³		Y			Y					Y ¹³	Y ¹³				
<i>J. procumbens</i>									Y ¹³		Y ¹³				Y		Y	Y ¹³		Y			Y					Y ¹³	Y ¹³				
<i>J. sabina</i>						Y ¹³			Y ¹³		Y ¹³				Y		Y	Y ¹³		Y			Y					Y ¹³	Y ¹³				
<i>J. squamata</i>									Y ¹³		Y ¹³				Y		Y	Y ¹³		Y			Y					Y ¹³	Y ¹³				
<i>J. virginiana</i>	Y				Y				Y ¹³	Y		Y	Y		Y	Y	Y	Y ¹³		Y			Y					Y	Y				
<i>Juniperus</i> spp.	Y ¹³	Y/-			Y				Y ¹³	Y		Y	Y		Y	Y ¹³	Y	Y ¹³		Y			Y ¹³		Y	Y		Y ¹³	Y ¹³				
<i>Lagerstroemia indica</i>	Y ¹³	N ¹³ /Y				Y ¹³			Y		Y				Y	Y ¹³	Y			Y								Y	Y				
<i>Lagerstroemia</i> spp.	Y ¹³	Y ¹³ /-		Y						Y																							
<i>Leptospermum scoparium</i>									Y																								
<i>Leucophyllum frutescens</i>									Y																								
<i>Leucothoe axillaris</i>				Y					Y	Y					Y	Y				Y								Y	Y				
<i>L. fontanesiana</i>				Y		Y			Y	Y					Y	Y				Y								Y	Y				

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<i>Musa aluminata</i>								Y	Y	Y																Y	Y										
<i>Myrica cerifera</i>						Y		Y	Y	Y	Y				Y					Y	Y					Y	Y										
<i>Myrtus communis</i>												Y			Y	Y				Y																	
<i>Nandina domestica</i>	Y	N/-		Y ¹⁵	Y	Y		Y	Y ¹³	Y		Y	Y	Y	Y	Y		Y		Y	Y	Y				Y ¹³	Y	Y	Y	Y	Y						
<i>Nerium oleander</i>				Y		Y							Y		Y	Y		Y	Y ¹³		Y	Y					Y ¹³										
<i>Nerium</i> spp.		Y/-								Y									Y																		
<i>Nyssa sylvatica</i>										Y									Y							Y											
<i>Osmanthus fragrans</i>		Y/-							Y								Y				Y	Y															
<i>Osmanthus</i> × <i>fortunei</i>									Y	Y											Y	Y					Y										
<i>O. heterophyllus</i>															Y	Y		Y			Y	Y															
<i>Osmanthus</i> spp.				Y ¹⁵	Y ¹⁵		Y ¹³					Y						Y			Y	Y															
<i>Paeonia</i> cultivars												Y						Y																			
<i>Philadelphus</i> spp.					Y	Y ¹³						Y														Y											
<i>Phoenix roebelinii</i>									Y	Y																Y											
<i>Photinia</i> × <i>fraseri</i>					Y ¹⁵	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y		Y			Y	Y					Y	Y	Y	Y	Y	Y	Y	Y	Y		
<i>Photinia</i> spp.		Y/-	Y																																		
<i>Pinus banksiana</i>		Y/Y																																			
<i>P. bungeana</i>		Y/-																																			

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<i>P. canariensis</i>					Y				Y						Y							Y					Y								
<i>P. clausa</i>		Y/Y															Y							Y											
<i>P. contorta</i>		Y/Y							Y								Y							Y											
<i>P. echinata</i>		Y/Y															Y								Y										
<i>P. elliotii</i>		Y/Y			Y	Y											Y								Y										
<i>P. mugo</i>		Y/-								Y							Y								Y										
<i>P. palustris</i>		Y/Y			Y	Y											Y								Y										
<i>P. ponderosa</i>		Y/Y															Y								Y										
<i>P. strobus</i>		Y/Y								Y							Y								Y										
<i>P. sylvestris</i>	Y	Y/Y								Y							Y								Y										
<i>P. taeda</i>		Y/Y			Y	Y				Y							Y								Y										
<i>P. virginiana</i>		Y/Y								Y							Y								Y										
<i>Pinus</i> spp.			Y	Y	Y ¹⁵	Y ¹³		Y	Y ¹³			Y	Y	Y	Y ¹³	Y ¹³	Y ¹³	Y	Y	Y ¹³	Y	Y ¹³	Y	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³		
<i>Pittosporum tobira</i>	Y			Y		Y			Y			Y			Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³		
<i>Pittosporum</i> spp.	Y ¹³	Y/-		Y						Y					Y		Y																		
<i>Platanus occidentalis</i>		Y/ Y ¹³	Y			Y			Y				Y		Y		Y											Y							
<i>P. racemosa</i>		Y/Y								Y																									
<i>Platycladus orientalis</i> (synonym <i>Thuja orientalis</i>)		Y/Y			Y	Y			Y						Y		Y											Y							

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Trees and Shrubs																																	
<i>Plumbago auriculata</i>		Y							Y						Y												Y	Y	Y	Y			
<i>Podocarpus gracilior</i> (see <i>Afrocarpus gracilior</i>)																																	
<i>P. macrophyllus</i>								Y		Y					Y	Y											Y	Y	Y	Y			
<i>Podocarpus</i> spp.		Y/-	Y	Y	Y			Y	Y	Y					Y					Y				Y			Y	Y	Y	Y			
<i>Populus deltoides</i>				Y ¹⁵				Y	Y	Y					Y				Y								Y	Y	Y	Y			
<i>Populus</i> spp.		Y/Y	Y		Y			Y	Y	Y		Y	Y ¹³				Y			Y	Y ¹³						Y	Y	Y	Y			
<i>Prunus caroliniana</i>								Y	Y	Y					Y	Y											Y	Y	Y	Y			
<i>P. laurocerasus</i>								Y	Y	Y					Y	Y															Y		
<i>Prunus</i> spp.	Y ¹³	Y/Y	Y	Y				Y ¹³	Y ¹³	Y ¹³		Y	Y ¹³	Y	Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y	Y	Y	Y ¹³	Y	Y			Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y ¹³		
<i>Psidium littorale</i> var. <i>lucidum</i> (synonym <i>P. cattleianum</i>)								Y	Y																								
<i>Pyracantha coccinea</i>												Y			Y	Y				Y			Y	Y							Y		
<i>P. koidzumii</i>															Y	Y																	
<i>P. crenatoserrata</i> (synonym <i>P. fortuneana</i>)															Y	Y																	
<i>Pyracantha</i> spp.		Y/-	Y	Y	Y	Y ¹³			Y ¹³	Y					Y	Y			Y	Y	Y	Y ¹³	Y	Y					Y	Y	Y	Y	
<i>Pyrus calleryana</i> 'Bradford'																																	

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<i>Pyrus</i> spp.		Y¹³/Y															Y¹³																				
<i>Quercus ilicifolia</i>		Y/-								Y							Y																				
<i>Q. laurifolia</i>						Y																															
<i>Q. nigra</i>																	Y			Y																	
<i>Q. palustris</i>		Y/-		Y		Y			Y	Y					Y¹³		Y			Y							Y	Y									
<i>Q. phellos</i>		Y/-				Y			Y	Y					Y¹³		Y			Y							Y	Y									
<i>Q. prinus</i>													Y				Y			Y							Y	Y									
<i>Q. rubra</i>		Y/-				Y			Y	Y					Y¹³		Y			Y							Y	Y									
<i>Q. shumardii</i>																																					
<i>Q. virginiana</i>		Y/-				Y			Y	Y					Y¹³					Y							Y	Y									
<i>Quercus</i> spp.		-Y			Y		Y¹³	Y				Y			Y			Y									Y	Y									
<i>Rhaphiolepis indica</i>		Y/-		Y¹⁵				Y	Y¹³	Y	Y		Y		Y¹³		Y¹³	Y		Y	Y	Y	Y	Y			Y	Y¹³	Y¹³	Y¹³	Y¹³	Y¹³	Y¹³	Y¹³			
<i>R. umbellata</i>				Y¹⁵														Y																			
<i>Rhapis excelsa</i>																																					
<i>Rhododendron</i> spp.	Y¹³	Y/-	Y	Y¹⁵	Y¹³	Y¹³	Y	Y	Y¹³	Y	N		Y	Y¹³	Y	Y¹³	Y¹³	Y¹³	Y	Y	Y¹³	Y¹³	Y¹³	Y¹³		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
<i>Rosa</i> spp.	Y¹³	Y/-	Y	Y	Y		Y	Y	Y¹³			Y			Y	Y			Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
<i>Rosmarinus officinalis</i>						Y			Y	Y					Y					Y																	

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Trees and Shrubs																																		
<i>Salix babylonica</i>								Y	Y						Y					Y								Y	Y		Y			
<i>Salix</i> spp.			Y		Y					Y			Y							Y	Y						Y							
<i>Spiraea cantoniensis</i>			Y		Y	Y							Y	Y				Y	Y		Y						Y							
<i>S. japonica</i>			Y		Y	Y			Y	Y			Y	Y				Y	Y		Y						Y							
<i>Spiraea</i> x <i>vanhouttei</i>			Y		Y	Y			Y	Y			Y	Y				Y	Y		Y						Y							
<i>Spiraea</i> spp.	Y ¹³							Y					Y													Y ¹³								
<i>Swietenia mahogani</i>									Y	Y					Y		Y										Y							
<i>Syagrus romanzoffianum</i> (synonym <i>Arecastrum romanzoffianum</i>)						Y			Y	Y					Y													Y						
<i>Tabebuia caraiba</i>									Y	Y					Y																			
<i>Taxodium distichum</i>			Y	Y		Y				Y		Y				Y				Y	Y						Y							
<i>Ternstroemia gymnanthera</i>									Y	Y								Y							Y									
<i>Thuja occidentalis</i>	Y ¹³	Y/Y			Y				Y	Y					Y ¹³			Y	Y								Y						Y ¹³	
<i>T. orientalis</i> (see <i>Platyclusus orientalis</i>)									Y	Y																								

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<i>Aquilegia</i> spp. & cultivars		Y				Y		Y ¹³												Y ¹³	Y																	
<i>Aspidistra elatior</i>								Y	Y																			Y										
<i>Calluna vulgaris</i>				Y					Y							Y												Y										
<i>Cortaderia selloana</i>					Y				Y					Y							Y						Y	Y				Y						
<i>Dietes iridioides</i> (synonym <i>Dietes vegeta</i>)								Y	Y						Y ¹³											Y ¹³												
<i>Gelsemium sempervirens</i>					Y				Y	Y								Y			Y						Y											
<i>Hedera canariensis</i>				Y ¹⁵					Y			Y				Y						Y					Y											
<i>H. helix</i>			Y	Y ¹⁵	Y	Y			Y			Y				Y					Y						Y											
<i>Hemerocallis</i> spp.							Y ¹³	Y ¹³	Y											Y	Y ¹³						Y											
<i>Hypericum</i> spp.				Y			Y		Y			Y						Y									Y											
<i>Jasminum mesnyi</i>												Y								Y																		
<i>J. nitidum</i>								Y										Y									Y											
<i>J. nudiflorum</i>																		Y																				
<i>Jasminum</i> spp.								Y ¹³						Y					Y																			
<i>Lantana camara</i>			Y	Y				Y	Y																			Y										

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Groundcovers and Vining Plants																																
<i>L. sellowiana</i> or <i>L. montevidensis</i>	Y		Y	Y				Y								Y	Y	Y			Y	Y				Y	Y	Y	Y	Y		
<i>Lantana</i> spp.		Y/-		Y				Y		Y					Y ¹³					Y					Y ¹³		Y	Y	Y	Y ¹³		
<i>Liriope muscari</i>				Y ¹⁵		Y		Y	Y ¹³		Y				Y ¹³					Y					Y ¹³		Y	Y	Y	Y ¹³		
<i>L. spicata</i>				Y ¹⁵		Y		Y	Y											Y												
<i>Lonicera japonica</i>		Y/-				Y			Y	Y					Y								Y		Y					Y	Y	
<i>L. sempervirens</i>									Y					Y ¹³																		
<i>Lonicera</i> spp.			Y	Y	Y	Y ¹³						Y		Y ¹³			Y ¹³			Y					Y ¹³		Y	Y	Y ¹³	Y ¹³	Y ¹³	
<i>Muhlenbergia capillaris</i>																		Y ¹³														
<i>Ophiopogon japonicus</i>						Y			Y		Y				Y					Y							Y				Y	
<i>Ophiopogon</i> spp.															Y ¹³																	
<i>Pachysandra terminalis</i>			Y	Y	Y	Y			Y		Y			Y	Y	Y		Y		Y							Y	Y	Y	Y	Y	
<i>Pennisetum</i> spp.		Y/-				Y			Y ¹³						Y ¹³					Y ¹³												
<i>Polystichum polyblepharum</i>									Y	Y					Y ¹³																	
<i>Rumohra adiantiformis</i>										Y					Y ¹³					Y												
<i>Ruscus hypophyllum</i>									Y											Y												

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Groundcovers and Vining Plants																																																						
<i>Trachelospermum asiaticum</i>						Y		Y	Y		Y	Y						Y ¹³					Y				Y																											
<i>T. jasminoides</i>			Y									Y			Y			Y			Y														Y																			
<i>Tulbaghia violacea</i>									Y						Y ¹³																																							
<i>Wedelia trilobata</i>																Y																																						
<i>Wisteria sinensis</i>			Y									Y				Y																																						
Annals and Perennials																																																						
<i>Achillea</i> spp.			Y ¹³	Y ¹⁵	Y	Y						Y ¹³			Y						Y							Y																										
<i>Agapanthus africanus</i>					Y	Y		Y ¹³							Y						Y							Y																										
<i>A. orientalis</i>																																																						
<i>Agapanthus</i> spp.				Y		Y ¹³						Y			Y ¹³													Y																										
<i>Agave</i> spp.									Y ¹³	Y ¹³																																												
<i>Ageratum</i> 'Hawaii Blue'	N																																																					
<i>Ageratum</i> spp.			Y	Y			Y ¹³					Y									Y																																	
<i>Ajuga</i> spp.			N	Y	Y ¹³	Y ¹³	Y ¹³		N			Y			Y ¹³	Y ¹³					Y ¹³																																	
<i>Allamanda cathartica</i>																																																						
<i>Allium</i> spp.																																																						

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<i>Athyrium nipponicum</i>				Y						Y					Y ¹³												Y										
<i>Begonia</i> spp.						Y	Y ¹³					N			N					Y		Y				Y					N						
<i>Bouvardia</i> hybrids																																					
<i>Bracteantha bracteata</i> (see <i>Helichrysum bracteatum</i>)						N	Y ¹³																														
<i>Buddleja davidii</i>		Y ¹³						Y ¹³								Y											Y										
bulbs, ornamental				Y ¹³	N		N		Y						Y												Y ¹³	Y ¹³	Y ¹³	Y	Y						
<i>Caladium bicolor</i>																											Y ¹³										
<i>Calendula officinalis</i>																												Y									
<i>Campanula</i> spp.			Y									Y ¹³			Y												Y						Y ¹³				
<i>Canna</i> spp.								Y ¹³				Y																									
<i>Carthamus tinctorius</i>																																					
<i>Caryopteris incana</i>																																					
<i>Catharanthus roseus</i>												N								Y																	
<i>Cattleya</i> cultivars																																					
<i>Celosia cristata</i>						Y														Y																Y	

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<i>Chrysanthemum × superbum</i>								Y	Y			N				Y	Y			Y						Y	Y	Y	Y	Y							
<i>Chrysanthemum</i> spp.			Y	Y		Y ¹³	Y ¹³		Y			N			Y ¹³	Y				Y ¹³						Y ¹³	Y	Y	Y ¹³	Y ¹³	Y ¹³						
<i>Cirsium japonicum</i>															N																N						
<i>Coleus</i> spp.			Y			Y ¹³									Y ¹³																Y ¹³						
<i>Coreopsis</i> spp.		Y ¹³	Y			Y			Y			Y ¹³			Y ¹³	Y					Y						Y	Y			Y ¹³						
<i>Cosmos</i> spp.			Y																																		
<i>Costus</i> spp.																																					
<i>Cuphea hyssopifolia</i>			Y						Y						Y ¹³																						
<i>Cyathea australis</i>																																					
<i>Cyclamen persicum</i>																																					
<i>Cymbidium</i> cultivars																																					
<i>Dahlia</i> spp.			Y	Y			Y ¹³													Y							Y										
<i>Delphinium</i> spp.			Y			Y						N								Y	Y																
<i>Dendranthema × grandiflorum</i> (synonym <i>Chrysanthemum morifolium</i>)			Y						Y						Y ¹³	Y				Y	Y						Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

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Annuals and Perennials																																									
<i>Dendrobium</i> cultivars																																									
<i>Dianthus barbatus</i>								Y	Y ¹³						Y ¹³				Y	Y							Y				Y										
<i>D. caryophyllus</i>												N									Y ¹³						Y														
<i>D. deltoides</i>												Y																													
<i>D. plumarius</i>						Y			Y											Y ¹³							Y														
<i>Dianthus</i> spp.	N		N				Y ¹³																																		
<i>Digitalis</i> spp.			Y									Y								Y								Y ¹³													
<i>Dracaena</i> spp.														N				Y ¹³																							
<i>Echinacea purpurea</i>									N			Y								Y							Y					Y		Y							
<i>Echinacea</i> spp.	N			Y								N																													
<i>Erigeron</i> cultivars																																									
<i>Eustoma grandiflorum</i>																																									
<i>Freesia</i> spp.																																									
<i>Gaillardia</i> spp.			Y	Y								Y								Y	Y							Y				Y ¹³									
<i>Gerbera jamesonii</i>																																									
<i>Gladiolus</i> spp.			Y	Y				Y				Y								Y	Y							Y				Y						Y ¹³			
<i>Gloriosa superba</i>																																									

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Scientific name or label designation	Annuals and Perennials																																											
	Biaithon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil¹	dithiopyr²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin³	oxadiazon⁴	oxyfluorfen⁵	oxyfluorfen + oryzalin⁶	oxyfluorfen + xadiazon⁷	pendimethalin⁸	Pennant Magnum®	PrePair®	proflamime⁹	RegalStar® II	Showcase™	simazine¹⁰	Tower™	trifluralin¹¹	trifluralin + isoxaben¹²	XL®														
<i>Gomphrena</i> cultivars																																												
<i>Gypsophila</i> spp.		Y¹³						Y¹³			Y				Y¹³			Y¹³					Y¹³				Y¹³	N			Y¹³													
<i>Helianthus</i> spp.	Y¹³		Y				Y																			Y																		
<i>Helichrysum bracteatum</i>		Y																																										
<i>Heliconia</i> spp.																																												
<i>Hemerocallis</i> spp.				Y			Y¹³	Y¹³	Y						Y¹³			Y					Y				Y						Y											
<i>Heuchera</i> spp.								Y¹³	Y¹³						Y¹³													Y¹³																
<i>Hippeastrum</i> cultivars																																												
<i>Hosta</i> spp.				Y		Y	Y	Y¹³	Y¹³						Y						Y¹³						Y¹³							Y										
<i>Hyacinthus</i> spp.																					Y																							
<i>Iberis sempervirens</i>			Y													Y																												
<i>Impatiens walleriana</i>																																												
<i>Iris pumila</i>																																												
<i>I. sibirica</i>																																												
<i>Iris</i> spp.			Y¹³	Y¹³	Y¹³	Y¹³	Y¹³	Y¹³	Y¹³						Y¹³																													

Table 4. Ornaments tolerant of some preemergence herbicides (Y = crop is listed for common chemical name, but may not be listed on all labels due to formulation differences, N = do not use product on indicated genus, species or hybrid). Always read the label for species/cultivar tolerance, special use, and injury instruction.

Scientific name or label designation	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil®	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePar®	prodiamine ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®		
																															Annuals and Perennials	
<i>Kalanchoe</i> cultivars																																
<i>Kniphofia uvaria</i>			Y																													
<i>Lathyrus odoratus</i>				Y																												
<i>Liatris spicata</i>												Y									Y											
<i>Lilium</i> spp.												Y ¹³										Y										
<i>Limonium perezii</i>									Y																							
<i>Limonium</i> spp.																					Y											
<i>Lobelia</i> spp.																						Y ¹³										
<i>Lunaria annua</i>																																
<i>Lupinus</i> spp.																								N								
<i>Lysimachia</i> spp.																																
<i>Mirabilis jalapa</i>																																
<i>Monarda didyma</i>																																
<i>Narcissus</i> spp.																																
<i>Nigella damascena</i>																																
<i>Pachysandra terminalis</i>																																
<i>Pachysandra</i> spp.																																
<i>Paeonia</i> cultivars																																

Table 4. Ornamentals tolerant of some preemergence herbicides (Y = crop is listed for common chemical name, but may not be listed on all labels due to formulation differences, N = do not use product on indicated genus, species or hybrid). Always read the label for species/cultivar tolerance, special use, and injury instruction.

Scientific name or label designation	Bialthlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil®	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®								
Annuals and Perennials																																						
<i>Pelargonium hortorum</i>			Y	Y	Y	Y						Y			Y					Y ¹³	Y										Y							
<i>Pentas lanceolata</i>							Y		Y											Y ¹³																		
<i>Petunia × hybrida</i>	N		Y	Y	Y ¹³	Y ¹³	Y ¹³	Y	Y ¹³		N	N			Y ¹³					Y ¹³	Y ¹³		Y				Y ¹³	Y	Y	Y	Y							
<i>Phalaenopsis</i> cultivars																			Y																			
<i>Philodendron</i> spp.														Y																								
<i>Phlox</i> spp.			N				N		Y ¹³			Y ¹³								Y	Y							Y	N ¹⁶									
<i>Platycodon grandiflorus</i>																																						
<i>Portulaca grandiflora</i>			Y			Y		Y							Y													Y					Y					
<i>Primula</i> spp.																																						
<i>Protea</i> spp. & cultivars															Y ¹³	Y		Y ¹³																				
<i>Ranunculus asiaticus</i>																																						
<i>Rosmarinus officinalis</i>						Y			Y						Y																							
<i>Rudbeckia</i> spp.				Y ¹³		Y ¹³			Y ¹³			Y ¹³			Y ¹³																							
<i>Saintpaulia ionantha</i>			Y																																			
<i>Salvia farinacea</i>																																						

Table 4. Ornamentals tolerant of some preemergence herbicides (Y = crop is listed for common chemical name, but may not be listed on all labels due to formulation differences, N = do not use product on indicated genus, species or hybrid). Always read the label for species/cultivar tolerance, special use, and injury instruction.

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<i>S. sylvestris</i>							Y																											
<i>Salvia</i> spp.	N	Y ¹³		Y ¹³		N	Y	Y ¹³			Y ¹³	Y ¹³	Y ¹³	Y ¹³	Y		Y			Y ¹³				Y ¹³		Y				Y				
<i>Scabiosa</i> spp. & cultivars	N										Y	Y														Y								
<i>Schefflera arboricola</i>															Y			Y																
<i>Scilla siberica</i>																																		
<i>Sedum</i> spp.				Y	Y	Y ¹³	Y	Y	N			Y ¹³		Y ¹³	Y ¹³	Y			Y	Y	Y ¹³					Y	Y	N		Y ¹³				
<i>Senecio cineraria</i>					Y	Y																												
<i>Solidago</i> cultivars							Y																											
<i>Strelitzia reginae</i>				Y ¹⁵											Y																			
<i>Tagetes</i> spp.			Y			Y	Y ¹³	Y ¹³				N		Y	Y					Y ¹³	Y				Y ¹³		Y							
<i>Trachelium caeruleum</i>																																		
<i>Tradescantia virginiana</i>			Y								Y																							
<i>Tulbaghia violacea</i>									Y						Y ¹³																			
<i>Tulipa</i> spp.									Y						Y																			
<i>Verbena</i> spp.							Y		Y						Y ¹³		Y ¹³			Y	Y ¹³						Y							
<i>Vinca</i> spp.	Y ¹³			Y		Y ¹³	Y ¹³		Y			Y ¹³	Y	Y ¹³	Y ¹³	Y ¹³			Y								Y				Y			
<i>Viola</i> spp.			N			Y ¹³	Y ¹³				N				Y ¹³					Y ¹³	Y												Y ¹³	

Table 4. Ornamentals tolerant of some preemergence herbicides (Y = crop is listed for common chemical name, but may not be listed on all labels due to formulation differences, N = do not use product on indicated genus, species or hybrid). Always read the label for species/cultivar tolerance, special use, and injury instruction.

Scientific name or label designation	Biathlon®	BroadStar™/SureGuard™	Dacthal®	Devrinol®	dichlobenil ¹	dithiopyr ²	Eptam®	FreeHand®	Gallery™	Granular Herbicide 75	Image®	Jewel™	Kerb®	OH2®	oryzalin ³	oxadiazon ⁴	oxyfluorfen ⁵	oxyfluorfen + oryzalin ⁶	oxyfluorfen + xadiazon ⁷	pendimethalin ⁸	Pennant Magnum®	PrePair®	proflamime ⁹	RegalStar® II	Showcase™	simazine ¹⁰	Tower™	trifluralin ¹¹	trifluralin + isoxaben ¹²	XL®		
Annuals and Perennials																																
<i>Xerochrysum bracteatum</i> (see <i>Helichrysum bracteatum</i>)	N		Y ¹³	Y ¹³			N	Y	Y ¹³			Y ¹³		Y ¹³	Y		Y			Y ¹³						Y ¹³	Y			Y		
<i>Yucca filamentosa</i>								Y	Y	Y				N						Y ¹³		Y										
<i>Zantedeschia</i> cultivars															Y												Y ¹³				Y	
<i>Zinnia elegans</i>												N			Y						Y ¹³							Y			Y	
<i>Zinnia</i> spp.	N		Y	Y			Y ¹³	Y ¹³				N																				

¹Barrier®, Casoron® — dichlobenil is highly volatile and, therefore, has the potential to be phytotoxic. Use with caution, avoid situations where gaseous concentrations can build up, apply when temperatures are low (volatility increases with increasing temperature), and incorporate immediately after application.

² Dimension®, Dithiopyr, Dynamo™

³ Oryzalin, Surflan®

⁴ Oxadiazon, Ronstar®

⁵ Galigan®, Goal®

⁶ Double O E-Pro, Rout®

⁷ O-O Herbicide™, Two OX E-Pro

⁸ Corral™, Pendulum®, Pin-dee™

⁹ Barricade®, Cavalcade™, ProClipse™, RegalKade®

¹⁰ Princep®, Simazine, Sim-Trol®

¹¹ Treflan®, Trifluralin

¹² Preen® Plus, Quali-Pro® T/I, Snapshot™ TG

¹³ Check product labels for species and/or varieties, as well as treatment method and application instructions.

¹⁴- = crop not on the label of this formulation.

¹⁵ Label(s) list only common names so species/cultivars tested for safety are not known. Test on a small number of plants prior to widespread use.

¹⁶ Do not use on *Phlox drummondii*.

Table 5. Common name reference list for ornamental crops.

Common Name	Scientific name or label designation
abelia, glossy	<i>Abelia</i> × <i>grandiflora</i>
acacia	<i>Acacia</i> spp.
Adam's needle, yucca	<i>Yucca filamentosa</i>
African iris	<i>Dietes iridioides</i> (synonym <i>Dietes vegeta</i>)
African violet	<i>Saintpaulia ionantha</i>
agapanthus	<i>Agapanthus africanus</i>
ageratum	<i>Ageratum</i> spp.
ajuga	<i>Ajuga reptans</i>
Algerian ivy	<i>Hedera canariensis</i>
allamanda	<i>Allamanda cathartica</i>
allium	<i>Allium</i> spp.
alyssum	<i>Alyssum</i> spp.
amaryllis	<i>Hippeastrum</i> cultivars
American arborvitae	<i>Thuja occidentalis</i>
American dogwood	<i>Cornus stolonifera</i>
American holly	<i>Ilex opaca</i>
American plane tree	<i>Platanus occidentalis</i>
angelwing jasmine	<i>Jasminum nitidum</i>
anise, Chinese	<i>Illicium anisatum</i>
anise, Florida	<i>Illicium floridanum</i>
anise, purple	<i>Illicium floridanum</i>
anise, star	<i>Illicium parviflorum</i>
anthurium	<i>Anthurium andraeanum</i>
aralia, Japanese	<i>Fatsia japonica</i>
arborvitae, American	<i>Thuja occidentalis</i>
arborvitae, Oriental	<i>Platyclusus orientalis</i> (synonym <i>Thuja orientalis</i>)
areca palm	<i>Chrysalidocarpus lutescens</i>
Arizona cypress	<i>Cupressus arizonica</i>
arum lily	<i>Zantedeschia</i> cultivars
ash	<i>Fraxinus</i> spp.
asparagus "fern"	<i>Asparagus</i> spp.
aster	<i>Aster</i> spp.
astilbe	<i>Astilbe</i> spp.
aucuba, gold-dust plant	<i>Aucuba japonica</i>

Table 5. Common name reference list for ornamental crops.

Australian tree fern	<i>Cyathea australis</i>
azalea spp.	<i>Rhododendron</i> spp.
baby's breath	<i>Gypsophila paniculata</i>
bachelor's button	<i>Gomphrena</i> cultivars
bald cypress	<i>Taxodium distichum</i>
balloon flower	<i>Platycodon grandiflorus</i>
bamboo, heavenly	<i>Nandina domestica</i>
bamboo palm	<i>Chamaedorea erumpens</i>
banana	<i>Musa aluminata</i>
banana shrub	<i>Michelia figo</i>
barberry	<i>Berberis</i> spp., <i>Berberis</i> × <i>gladwynensis</i>
barberry, Japanese	<i>Berberis thunbergii</i>
bee balm	<i>Monarda didyma</i>
begonia	<i>Begonia</i> spp.
bellflower	<i>Campanula</i> spp.
bergamot	<i>Monarda didyma</i>
birch, river	<i>Betula nigra</i>
bird-of-paradise	<i>Strelitzia reginae</i>
bishop's flower	<i>Ammi majus</i>
black gum	<i>Nyssa sylvatica</i>
black-eyed Susan	<i>Rudbeckia fulgida</i> , <i>R. hirta</i>
blanket flower	<i>Gaillardia</i> spp.
blazing star	<i>Liatris spicata</i>
blue lace flower	<i>Trachelium caeruleum</i>
blue Pacific juniper	<i>Juniperus conferta</i>
blue star juniper	<i>Juniperus squamata</i>
blue throatwort	<i>Trachelium caeruleum</i>
bluebeard	<i>Caryopteris incana</i>
bottlebrush, lemon	<i>Callistemon citrinus</i>
bottlebrush, weeping	<i>Callistemon viminalis</i>
bougainvillea	<i>Bougainvillea</i> spp.
boxwood	<i>Buxus</i> spp.
boxwood, littleleaf	<i>Buxus microphylla</i>
Bradford pear	<i>Pyrus calleryana</i> 'Bradford'
buckeye, red	<i>Aesculus pavia</i>
bush, butterfly	<i>Buddleja davidii</i> (synonym <i>Buddleia davidii</i>)

Table 5. Common name reference list for ornamental crops.

bush lantana	<i>Lantana camara</i>
butcher's broom	<i>Ruscus hypophyllum</i>
buttercup	<i>Ranunculus asiaticus</i>
butterfly weed	<i>Asclepias tuberosa</i>
caladium	<i>Caladium bicolor</i>
calla lily	<i>Zantedeschia cultivars</i>
camellia	<i>Camellia</i> spp.
camellia, Japanese	<i>Camellia japonica</i>
camellia, sasanqua	<i>Camellia sasanqua</i>
Canary Island pine	<i>Pinus canariensis</i>
candytuft, evergreen	<i>Iberis sempervirens</i>
cape jasmine or jessamine	<i>Gardenia augusta</i> (synonym <i>G. jasminoides</i>)
carnation	<i>Dianthus caryophyllus</i>
Carolina jessamine	<i>Gelsemium sempervirens</i>
cast iron plant	<i>Aspidistra elatior</i>
cedar, Eastern red	<i>Juniperus virginiana</i>
cedar, Southern red	<i>Juniperus silicicola</i>
century plant	<i>Agave americana</i>
chalcus	<i>Murraya paniculata</i>
cherry	<i>Prunus</i> spp.
cherry laurel, American	<i>Prunus caroliniana</i>
cherry laurel, English	<i>Prunus laurocerasus</i>
chestnut	<i>Castanea</i> spp.
chestnut oak	<i>Quercus prinus</i>
Chinese anise	<i>Illicium anisatum</i>
Chinese elm	<i>Ulmus parvifolia</i>
Chinese fan palm	<i>Livistona chinensis</i>
Chinese holly	<i>Ilex cornuta</i>
Chinese juniper	<i>Juniperus chinensis</i>
Chinese privet, variegated	<i>Ligustrum sinense</i> 'Variegated'
Christmas palm	<i>Veitchia merrillii</i>
chrysanthemum	<i>Chrysanthemum</i> spp., <i>Dendranthema</i> × <i>grandiflorum</i>
citrus, ornamental	<i>Citrus</i> spp.
cleyera	<i>Cleyera japonica</i> ; see also <i>Ternstroemia gymnanthera</i>
climbing lily	<i>Gloriosa rothschildiana</i> ; see <i>G. superba</i> 'Rothschildiana'
coastal leucothoe	<i>Leucothoe axillaris</i>

Table 5. Common name reference list for ornamental crops.

cockscomb, cock's comb	<i>Celosia cristata</i>
coleus	<i>Coleus</i> spp.
columbine	<i>Aquilegia</i> cultivars
coneflower	<i>Echinacea purpurea</i>
Confederate jasmine	<i>Trachelospermum jasminoides</i>
copperleaf	<i>Acalypha wilkesiana</i>
coral bells	<i>Heuchera sanguinea</i>
coreopsis	<i>Coreopsis</i> spp.
cosmos	<i>Cosmos</i> spp.
cotoneaster	<i>Cotoneaster</i> spp.
cotoneaster, cranberry	<i>Cotoneaster apiculatus</i>
cottonwood, Eastern	<i>Populus deltoides</i>
crape myrtle	<i>Lagerstroemia indica</i>
creeping juniper	<i>Juniperus horizontalis</i>
croton	<i>Codiaeum variegatum</i>
cypress, Arizona	<i>Cupressus arizonica</i>
cypress, bald	<i>Taxodium distichum</i>
cypress, false	<i>Chamaecyparis</i> spp.
cypress, Hinoki	<i>Chamaecyparis obtusa</i>
cypress, Italian	<i>Chamaecyparis sempervirens</i>
cypress, Lawson's	<i>Chamaecyparis lawsoniana</i>
cypress, Leyland	× <i>Cupressocyparis leylandii</i>
cypress, Sawara	<i>Chamaecyparis pisifera</i>
cypress spp.	<i>Cupressus</i> spp.
daffodil	bulbs, ornamental; <i>Narcissus</i> spp.
dahlia	<i>Dahlia</i> spp.
daisy, gloriosa	<i>Rudbeckia hirta</i>
daisy, shasta	<i>Chrysanthemum</i> × <i>superbum</i>
date palm, pigmy	<i>Phoenix roebelinii</i>
daylily	<i>Hemerocallis</i> spp.
delphinium	<i>Delphinium</i> spp.
deutzia	<i>Deutzia</i> spp.
dianthus	<i>Dianthus plumarius</i>
dogwood, American	<i>Cornus stolonifera</i>
dogwood, flowering	<i>Cornus florida</i>
dogwood, kousa	<i>Cornus kousa</i>

Table 5. Common name reference list for ornamental crops.

dracaena	<i>Dracaena</i> spp.
drake elm	<i>Ulmus parvifolia</i>
drooping leucothoe	<i>Leucothoe fontanesiana</i>
dusty miller	<i>Senecio cineraria</i>
Eastern cottonwood	<i>Populus deltoides</i>
Eastern red cedar	<i>Juniperus virginiana</i>
Eastern white pine	<i>Pinus strobus</i>
elaeanus, thorny	<i>Elaeagnus pungens</i>
elm	<i>Ulmus</i> spp.
elm, Chinese	<i>Ulmus parvifolia</i>
elm, drake	<i>Ulmus parvifolia</i>
English ivy	<i>Hedera helix</i>
escallonia	<i>Escallonia</i> spp.
eucalyptus	<i>Eucalyptus</i> spp.
eucalyptus, silver dollar	<i>Eucalyptus cinerea</i>
euonymus	<i>Euonymus</i> spp.
euonymus, creeping	<i>Euonymus fortunei</i>
euonymus, evergreen	<i>Euonymus japonica</i>
euonymus, spreading	<i>Euonymus kiautschovicus</i>
euonymus, winged	<i>Euonymus alatus</i>
European fan palm	<i>Chamaerops humilis</i>
false bird of Paradise	<i>Heliconia</i> spp.
false cypress	<i>Chamaecyparis</i> spp.
false holly	<i>Osmanthus heterophyllus</i>
false saffron	<i>Carthamus tinctorius</i>
false spiraea	<i>Astilbe</i> spp. and cultivars
fan palm, Chinese	<i>Livistona chinensis</i>
fan palm, European	<i>Chamaerops humilis</i>
fan palm, Mexican	<i>Washingtonia robusta</i>
fan palm, Washington	<i>Washingtonia robusta</i>
fatshedera	× <i>Fatshedera lizei</i>
"fern," asparagus	<i>Asparagus</i> spp.
"fern," tree	<i>Asparagus virgatus</i>
fern, Australian tree	<i>Cyathea australis</i>
fern, Japanese painted	<i>Athyrium nipponicum</i>
fern, leatherleaf	<i>Rumohra adiantiformis</i>

Table 5. Common name reference list for ornamental crops.

figus	<i>Ficus</i> spp.
figus, mini	<i>Ficus benjamina</i>
fig, fiddleleaf	<i>Ficus lyrata</i>
fig, weeping	<i>Ficus benjamina</i>
fir	<i>Abies</i> spp.
fir, balsam	<i>Abies balsamea</i>
fir, Fraser	<i>Abies fraseri</i>
fir, white	<i>Abies concolor</i>
firethorn	<i>Pyracantha</i> spp.
firethorn, Formosa	<i>Pyracantha koidzumii</i>
firethorn, scarlet	<i>Pyracantha coccinea</i>
fishtail palm	<i>Caryota</i> spp.
flame lily	<i>Gloriosa superba</i>
flame maple	<i>Acer ginnala</i>
fleabane	<i>Erigeron</i> cultivars
Florida anise	<i>Illicium floridanum</i>
florists' chrysanthemum	<i>Dendranthema</i> × <i>grandiflorum</i>
florists' cyclamen	<i>Cyclamen persicum</i>
flowering dogwood	<i>Cornus florida</i>
forsythia	<i>Forsythia</i> spp.
forsythia, border	<i>Forsythia</i> × <i>intermedia</i>
Fortune's osmanthus	<i>Osmanthus</i> × <i>fortunei</i>
fountain grass	<i>Pennisetum</i> spp.
four o'clock	<i>Mirabilis jalapa</i>
foxglove	<i>Digitalis</i> spp.
Fraser's photinia	<i>Photinia</i> × <i>fraseri</i>
freesia	<i>Freesia</i> spp.
gaillardia	<i>Gaillardia</i> spp.
gallberry	<i>Ilex glabra</i>
gardenia	<i>Gardenia jasminoides</i>
garlic, society	<i>Tulbaghia violacea</i>
gazania	<i>Gazania</i> spp.
geranium	<i>Pelargonium hortorum</i>
gerbera daisy	<i>Gerbera jamesonii</i>
ginkgo	<i>Ginkgo biloba</i>
gladiolus	<i>Gladiolus</i> spp.

Table 5. Common name reference list for ornamental crops.

globe amaranth	<i>Gomphrena</i> cultivars
gloriosa daisy	<i>Rudbeckia hirta</i>
gloriosa lily	<i>Gloriosa rothschildiana</i> ; see <i>G. superba</i> 'Rothschildiana'
glory lily	<i>Gloriosa superba</i>
glossy abelia	<i>Abelia</i> × <i>grandiflora</i>
glossy privet	<i>Ligustrum lucidum</i>
gold-dust plant	<i>Aucuba japonica</i>
golden everlasting	<i>Helichrysum bracteatum</i>
goldenrod	<i>Solidago</i> spp. & cultivars
grass, fountain	<i>Pennisetum</i> spp.
grass, mondo	<i>Ophiopogon japonicus</i>
grass, pampas	<i>Cortaderia selloana</i>
guava, pineapple	<i>Acca sellowiana</i>
guava, strawberry	<i>Psidium littorale</i> var. <i>lucidum</i>
gum, black	<i>Nyssa sylvatica</i>
gum, lemon scented	<i>Eucalyptus citriodora</i>
gum, sweet	<i>Liquidambar styraciflua</i>
hawthorn, Indian	<i>Rhaphiolepis indica</i> ; <i>Rhaphiolepis umbellata</i>
heather, Mexican	<i>Cuphea hyssopifolia</i>
heather, Scotch	<i>Calluna vulgaris</i>
heavenly bamboo	<i>Nandina domestica</i>
hibiscus	<i>Hibiscus rosa-sinensis</i>
hickory	<i>Carya</i> spp.
Hinoki cypress	<i>Chamaecyparis obtusa</i>
holly	<i>Ilex</i> spp.
holly, American	<i>Ilex opaca</i>
holly, Chinese	<i>Ilex cornuta</i>
holly, false	<i>Osmanthus heterophyllus</i>
holly, Japanese	<i>Ilex crenata</i>
holly, Nellie Stevens	<i>Ilex</i> × 'Nellie Stevens'
holly, Savannah	<i>Ilex attenuata</i> 'Savannah'
holly, yaupon	<i>Ilex vomitoria</i>
honesty	<i>Lunaria annua</i>
honeysuckle	<i>Lonicera</i> spp.
honeysuckle, Japanese	<i>Lonicera japonica</i>
hosta	<i>Hosta</i> spp.

Table 5. Common name reference list for ornamental crops.

hyacinth	<i>Hyacinthus</i> spp.
hydrangea	<i>Hydrangea</i> spp.
impatiens	<i>Impatiens walleriana</i>
Indian hawthorn	<i>Rhaphiolepis indica</i>
inkberry	<i>Ilex glabra</i>
iris	<i>Iris</i> spp.
iris, African	<i>Dietes iridioides</i> (synonym <i>Dietes vegeta</i>)
iris, bulbous	bulbs, ornamental
Italian cypress	<i>Cupressus sempervirens</i>
ivy, Algerian	<i>Hedera canariensis</i>
ivy, English	<i>Hedera helix</i>
ixora	<i>Ixora coccinea</i>
Jack pine	<i>Pinus banksiana</i>
Japanese aralia	<i>Fatsia japonica</i>
Japanese barberry	<i>Berberis thunbergii</i>
Japanese camellia	<i>Camellia japonica</i>
Japanese holly	<i>Ilex crenata</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Japanese maple	<i>Acer palmatum</i>
Japanese painted fern	<i>Athyrium nipponicum</i>
Japanese privet	<i>Ligustrum japonicum</i>
Japanese spiraea	<i>Spiraea japonica</i>
Japanese star jasmine	<i>Trachelospermum asiaticum</i>
Japanese thistle	<i>Cirsium japonicum</i>
Japanese viburnum	<i>Viburnum japonicum</i>
jasmine	<i>Jasminum</i> spp.
jasmine, angelwing	<i>Jasminum nitidum</i>
jasmine, Confederate	<i>Trachelospermum jasminoides</i>
jasmine, Japanese star	<i>Trachelospermum asiaticum</i>
jasmine, orange	<i>Murraya paniculata</i>
jasmine, pinwheel	<i>Jasminum nitidum</i>
jasmine, primrose	<i>Jasminum mesnyi</i>
jasmine, shining	<i>Jasminum nitidum</i>
jasmine, small-leaf	<i>Trachelospermum asiaticum</i>
jasmine, star	<i>Trachelospermum jasminoides</i>
jasmine, winter	<i>Jasminum nudiflorum</i>

Table 5. Common name reference list for ornamental crops.

jessamine, Carolina	<i>Gelsemium sempervirens</i>
juniper	<i>Juniperus</i> spp.
juniper, blue Pacific	<i>Juniperus conferta</i>
juniper, blue star	<i>Juniperus squamata</i>
juniper, Chinese	<i>Juniperus chinensis</i>
juniper, creeping	<i>Juniperus horizontalis</i>
juniper, Japanese garden	<i>Juniperus chinensis</i>
juniper, nana-dwarf	<i>Juniperus procumbens</i>
juniper, Parson's,	<i>Juniperus squamata</i>
juniper, savin	<i>Juniperus sabina</i>
juniper, shore	<i>Juniperus conferta</i>
kousa dogwood	<i>Cornus kousa</i>
lady palm	<i>Rhapis excelsa</i>
lantana, bush	<i>Lantana camara</i>
lantana, trailing	<i>Lantana sellowiana</i>
laurel, American cherry	<i>Prunus caroliniana</i>
laurel, English cherry	<i>Prunus laurocerasus</i>
laurel oak	<i>Quercus laurifolia</i>
Lawson's cypress	<i>Chamaecyparis lawsoniana</i>
leatherleaf fern	<i>Rumohra adiantiformis</i>
lemon bottlebrush	<i>Callistemon citrinus</i>
lemon scented gum	<i>Eucalyptus citriodora</i>
leucothoe, coastal	<i>Leucothoe axillaris</i>
leucothoe, drooping	<i>Leucothoe fontanesiana</i>
Leyland cypress	× <i>Cupressocyparis leylandii</i>
liatris	<i>Liatris spicata</i>
ligustrum	<i>Ligustrum</i> spp.
lily	<i>Lilium</i> spp.
lily of the Incas	<i>Alstroemeria</i> cultivars
lily turf	<i>Liriope muscari</i>
lily turf, creeping	<i>Liriope spicata</i>
liriope	<i>Liriope muscari</i>
lisianthus	<i>Eustoma grandiflorum</i>
littleleaf boxwood	<i>Buxus microphylla</i>
live oak	<i>Quercus virginiana</i>
lobelia	<i>Lobelia</i> spp.

Table 5. Common name reference list for ornamental crops.

loblolly pine	<i>Pinus taeda</i>
lobster claw	<i>Heliconia</i> spp.
lodgepole pine	<i>Pinus contorta</i>
longleaf pine	<i>Pinus palustris</i>
loquat	<i>Eriobotrya japonica</i>
love-in-a-mist	<i>Nigella damascena</i>
love-lies-bleeding	<i>Amaranthus caudatus</i>
lupine	<i>Lupinus</i> spp.
magnolia	<i>Magnolia</i> spp.
magnolia, saucer	<i>Magnolia</i> × <i>soulangeana</i>
magnolia, Southern	<i>Magnolia grandiflora</i>
mahogany	<i>Swietenia mahogani</i>
mahonia	<i>Mahonia</i> spp.
Manila palm	<i>Veitchia merrillii</i>
maple	<i>Acer</i> spp.
maple, flame	<i>Acer ginnala</i>
maple, Japanese	<i>Acer palmatum</i>
maple, red	<i>Acer rubrum</i>
maple, silver	<i>Acer saccharinum</i>
maple, sugar	<i>Acer saccharum</i>
marigold	<i>Tagetes</i> spp.
Mexican fan palm	<i>Washingtonia robusta</i>
Mexican heather	<i>Cuphea hyssopifolia</i>
mondo grass	<i>Ophiopogon japonicus</i>
money plant	<i>Lunaria annua</i>
moneywort	<i>Lysimachia nummularia</i>
moss rose	<i>Portulaca grandiflora</i>
moth orchid	<i>Phalaenopsis</i> cultivars
mulberry, white	<i>Morus alba</i>
myrtle	<i>Myrtus communis</i>
myrtle, crape	<i>Lagerstroemia indica</i>
myrtle, wax	<i>Myrica cerifera</i>
nana-dwarf juniper	<i>Juniperus procumbens</i>
nandina	<i>Nandina domestica</i>
narcissus	<i>Narcissus</i> spp.
natal plum	<i>Carissa macrocarpa</i> (synonym <i>C. grandiflora</i>)

Table 5. Common name reference list for ornamental crops.

Nellie Stevens holly	<i>Ilex</i> × 'Nellie Stevens'
no-azami	<i>Cirsium japonicum</i>
Norfolk Island pine	<i>Araucaria heterophylla</i>
oak	<i>Quercus</i> spp.
oak, chestnut	<i>Quercus prinus</i>
oak, laurel	<i>Quercus laurifolia</i>
oak, live	<i>Quercus virginiana</i>
oak, pin	<i>Quercus palustris</i>
oak, red	<i>Quercus rubra</i>
oak, Shumard	<i>Quercus shumardii</i>
oak, water	<i>Quercus nigra</i>
oak, willow	<i>Quercus phellos</i>
oak-leaf hydrangea	<i>Hydrangea quercifolia</i>
old-fashioned weigela	<i>Weigela florida</i>
oleander	<i>Nerium oleander</i>
olive, black	<i>Bucida buceras</i>
olive, Russian	<i>Elaeagnus angustifolia</i>
orange jasmine	<i>Murraya paniculata</i>
orchid tree	<i>Bauhinia galpinii</i>
Oriental arborvitae	<i>Platyclusus orientalis</i> (synonym <i>Thuja orientalis</i>)
osmanthus	<i>Osmanthus fragrans</i>
osmanthus, Fortune's	<i>Osmanthus</i> × <i>fortunei</i>
pachysandra	<i>Pachysandra terminalis</i>
painted fern, Japanese	<i>Athyrium nipponicum</i>
palm, areca	<i>Chrysalidocarpus lutescens</i>
palm, bamboo	<i>Rhapis excelsa</i>
palm, cat	<i>Chamaedorea cataractarum</i>
palm, Chinese fan	<i>Livistona chinensis</i>
palm, Christmas	<i>Veitchia merrillii</i>
palm, European fan	<i>Chamaerops humilis</i>
palm, fishtail	<i>Caryota</i> spp.
palm, lady	<i>Rhapis excelsa</i>
palm, Manila	<i>Veitchia merrillii</i>
palm, Mexican fan	<i>Washingtonia robusta</i>
palm, parlor	<i>Chamaedorea elegans</i>
palm, pigmy date	<i>Phoenix roebelinii</i>

Table 5. Common name reference list for ornamental crops.

palm, queen	<i>Syagrus romanzoffianum</i>
palm, sago	<i>Cycas revoluta</i>
palm, Washington fan	<i>Washingtonia robusta</i>
palm, windmill	<i>Trachycarpus fortunei</i>
pampas grass	<i>Cortaderia selloana</i>
pansy	<i>Viola</i> spp.
parlor palm	<i>Chamaedorea elegans</i>
Parson's juniper	<i>Juniperus squamata</i>
pear, Bradford	<i>Pyrus calleryana</i> 'Bradford'
pentas	<i>Pentas lanceolata</i>
peony	<i>Paeonia</i> cultivars
periwinkle, common	<i>Vinca</i> spp.
periwinkle, Madagascar	<i>Catharanthus roseus</i>
Persian buttercup	<i>Ranunculus asiaticus</i>
Persian violet	<i>Cyclamen persicum</i>
Peruvian lily	<i>Alstroemeria</i> cultivars
petunia	<i>Petunia</i> × <i>hybrida</i>
philodendron	<i>Philodendron</i> spp.
phlox	<i>Phlox</i> spp.
photinia, Fraser's	<i>Photinia</i> × <i>fraseri</i>
pigmy date palm	<i>Phoenix roebelinii</i>
pin oak	<i>Quercus palustris</i>
pincushion flower	<i>Scabiosa</i> cultivars
pine	<i>Pinus</i> spp.
pine, Canary Island	<i>Pinus canariensis</i>
pine, Eastern white	<i>Pinus strobus</i>
pine, Jack	<i>Pinus banksiana</i>
pine, loblolly	<i>Pinus taeda</i>
pine, lodgepole	<i>Pinus contorta</i>
pine, longleaf	<i>Pinus palustris</i>
pine, Norfolk Island	<i>Araucaria heterophylla</i>
pine, sand	<i>Pinus clausa</i>
pine, slash	<i>Pinus elliotii</i>
pineapple guava	<i>Acca sellowiana</i>
pinks	<i>Dianthus plumarius</i>
pinwheel jasmine	<i>Jasminum nitidum</i>

Table 5. Common name reference list for ornamental crops.

pittosporum	<i>Pittosporum</i> spp.
pittosporum	<i>Pittosporum tobira</i>
plane tree, American	<i>Platanus occidentalis</i>
plum, natal	<i>Carissa macrocarpa</i> (synonym <i>C. grandiflora</i>)
plumbago	<i>Plumbago auriculata</i>
podocarpus	<i>Podocarpus macrophyllus</i> , <i>Podocarpus</i> spp.
podocarpus, weeping	<i>Podocarpus gracilior</i>
portulaca	<i>Portulaca grandiflora</i>
pot marigold	<i>Calendula officinalis</i>
prairie gentian	<i>Eustoma grandiflorum</i>
primrose	<i>Primula</i> spp.
primrose jasmine	<i>Jasminum mesnyi</i>
princes flower	<i>Tibouchina urvilleana</i>
privet	<i>Ligustrum</i> spp.
privet, glossy	<i>Ligustrum lucidum</i>
privet, Japanese	<i>Ligustrum japonicum</i>
privet, variegated Chinese	<i>Ligustrum sinense</i> 'Variegatum'
privet, Vicaryi	<i>Ligustrum</i> × <i>vicaryi</i>
purple anise	<i>Illicium floridanum</i>
pyracantha	<i>Pyracantha</i> spp.
pyracantha	<i>Pyracantha crenatoserrata</i> (synonym <i>P. fortuneana</i>)
Queen Anne's lace	<i>Ammi majus</i>
queen palm	<i>Syagrus romanzoffianum</i>
red buckeye	<i>Aesculus pavia</i>
red cedar, Eastern	<i>Juniperus virginiana</i>
red cedar, Southern	<i>Juniperus silicicola</i>
red maple	<i>Acer rubrum</i>
red oak	<i>Quercus rubra</i>
red-hot poker	<i>Kniphofia uvaria</i>
redbud	<i>Cercis canadensis</i>
rhapiolepis	<i>Rhapiolepis umbellata</i>
river birch	<i>Betula nigra</i>
rose	<i>Rosa</i> spp.
rose, moss	<i>Portulaca grandiflora</i>
rose of China	<i>Hibiscus rosa-sinensis</i>
rose of Sharon	<i>Hibiscus syriacus</i>

Table 5. Common name reference list for ornamental crops.

rosemary	<i>Rosmarinus officinalis</i>
ruscus	<i>Ruscus hypophyllum</i>
Russian olive	<i>Elaeagnus angustifolia</i>
safflower	<i>Carthamus tinctorius</i>
sage	<i>Salvia</i> spp.
sage, Texas	<i>Leucophyllum frutescens</i>
sago palm	<i>Cycas revoluta</i>
salvia	<i>Salvia farinacea</i>
sandankwa viburnum	<i>Viburnum suspensum</i>
sasanqua camellia	<i>Camellia sasanqua</i>
saucer magnolia	<i>Magnolia</i> × <i>soulangeana</i>
Savannah holly	<i>Ilex attenuata</i> 'Savannah'
savin juniper	<i>Juniperus sabina</i>
Sawara cypress	<i>Chamaecyparis pisifera</i>
schefflera	<i>Schefflera arboricola</i>
Scotch heather	<i>Calluna vulgaris</i>
sea lavender	<i>Limonium perezii</i>
sedum	<i>Sedum</i> spp.
shasta daisy	<i>Chrysanthemum</i> × <i>superbum</i>
shining jasmine	<i>Jasminum nitidum</i>
shore juniper	<i>Juniperus conferta</i>
shrub, banana	<i>Michelia figo</i>
Shumard oak	<i>Quercus shumardii</i>
Siberian squill	<i>Scilla siberica</i>
silver dollar	<i>Lunaria annua</i>
silver dollar tree	<i>Eucalyptus cinerea</i>
silver maple	<i>Acer saccharinum</i>
slash pine	<i>Pinus elliottii</i>
small-leaf jasmine	<i>Trachelospermum asiaticum</i>
snapdragon	<i>Antirrhinum majus</i>
society garlic	<i>Tulbaghia violacea</i>
Southern magnolia	<i>Magnolia grandiflora</i>
Southern red cedar	<i>Juniperus silicicola</i>
spiderwort	<i>Tradescantia virginiana</i>
spiraea	<i>Spiraea cantoniensis</i>
spiraea, false	<i>Astilbe</i> spp.

Table 5. Common name reference list for ornamental crops.

spiraea, Japanese	<i>Spiraea japonica</i>
spiraea, Van Houtte	<i>Spiraea × vanhouttei</i>
spiral flag	<i>Costus</i> spp.
St. John's wort	<i>Hypericum</i> spp.
star anise	<i>Illicium parviflorum</i>
star jasmine	<i>Trachelospermum jasminoides</i>
statice	<i>Limonium perezii</i>
strawberry guava	<i>Psidium littorale</i> var. <i>lucidum</i>
strawflower	<i>Xerochrysum bracteatum</i> , <i>Bracteantha bracteata</i> (see <i>Helichrysum bracteatum</i>)
sugar maple	<i>Acer saccharum</i>
summer lilac	<i>Buddleja davidii</i>
sunflower	<i>Helianthus</i> spp.
sweet gum	<i>Liquidambar styraciflua</i>
sweet tea	<i>Osmanthus fragrans</i>
sweet William	<i>Dianthus barbatus</i>
sweetpea	<i>Lathyrus odoratus</i>
sweetspire	<i>Itea ilicifolia</i>
sycamore	<i>Platanus occidentalis</i>
tabebuia	<i>Tabebuia caraiba</i>
tea, sweet	<i>Osmanthus fragrans</i>
tea tree	<i>Leptospermum scoparium</i>
ternstroemia	<i>Ternstroemia gymnanthera</i>
Texas sage	<i>Leucophyllum frutescens</i>
trailing lantana	<i>Lantana sellowiana</i>
tree "fern"	<i>Asparagus virgatus</i>
tree fern, Australian	<i>Cyathea australis</i>
tree, orchid	<i>Bauhinia galpinii</i>
tree, tea	<i>Leptospermum scoparium</i>
tree, tulip	<i>Liriodendron tulipifera</i>
tulip	bulbs, ornamental; <i>Tulipa</i> spp.
tulip tree	<i>Liriodendron tulipifera</i>
Van Houtte spiraea	<i>Spiraea × vanhouttei</i>
variegated Chinese privet	<i>Ligustrum sinense</i> 'Variegatum'
verbena	<i>Verbena</i> spp.
viburnum	<i>Viburnum</i> spp.
viburnum, Japanese	<i>Viburnum japonicum</i>

Table 5. Common name reference list for ornamental crops.

viburnum, sandankwa	<i>Viburnum suspensum</i>
Vicaryi privet	<i>Ligustrum × vicaryi</i>
vinca	<i>Vinca</i> spp.
violet, African	<i>Saintpaulia ionantha</i>
Washington fan palm	<i>Washingtonia robusta</i>
water oak	<i>Quercus nigra</i>
wax myrtle	<i>Myrica cerifera</i>
wedelia	<i>Wedelia trilobata</i>
weeping bottlebrush	<i>Callistemon viminalis</i>
weeping fig	<i>Ficus benjamina</i>
weeping podocarpus	<i>Podocarpus gracilior</i>
weigela, old-fashioned	<i>Weigela florida</i>
willow	<i>Salix</i> spp.
willow oak	<i>Quercus phellos</i>
willow, weeping	<i>Salix babylonica</i>
wind flower	<i>Anemone coronaria</i>
windmill palm	<i>Trachycarpus fortunei</i>
winter jasmine	<i>Jasminum nudiflorum</i>
wintercreeper	<i>Euonymus fortunei</i>
wintergreen barberry	<i>Berberis julianae</i>
wisteria	<i>Wisteria sinensis</i>
wort, St. John's	<i>Hypericum</i> spp.
xylosma	<i>Xylosma congestum</i>
yarrow	<i>Achillea</i> spp.
yaupon holly	<i>Ilex vomitoria</i>
yucca, Adam's needle	<i>Yucca filamentosa</i>
zinnia	<i>Zinnia elegans</i>