

Commercial Nursery and Landscape

Table 1. Preemergence herbicides.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
benefin + oryzalin @ 4.0-6.0 lbs/A	XL 2 G @ 200-300 lbs/A or 4.5-7 lbs/1,000 sq ft	Annual grasses, some small-seeded broadleaves.	May be used in commercial nursery production and landscape beds. Several annual and perennial landscape plants are tolerant. Consult product label.
bensulide @ 7.5-12.5 lbs/A	Betasan 4E @ 15-25 pts/A or 5.6-7.3 oz/1,000 sq ft	Annual grasses, some small-seeded broadleaves.	Several tolerant annual and perennial ornamentals. Check label for tolerant species and susceptible weeds. Irrigate to move product into weed seed germination zone. Do not use peat moss prior to application. May be used in landscape beds.
DCPA @ 10-15 lbs/A	DCPA 5 G @ 218 lbs/A or 5 lbs/1,000 sq ft	Annual grasses, some small-seeded broadleaves.	Several tolerant ornamentals. Commercial ornamental production and landscape bed use allowed. Consult label. Do not apply to pansies or phlox in landscape beds.
dithiopyr @ 0.5 lbs/A	Dimension 2 EW or Dithiopyr 2 L @ 2 pt/A or 0.73 or 0.73 oz/1,000 sq ft	Annual grasses, some small-seeded broadleaves. Early post control of crabgrass.	May be used in commercial nursery production and landscape beds. Several annual and perennial landscape plants are tolerant to over the top or directed sprays. Consult product label.
dimethenamid + pendimethalin @ 1.75-3.5 lbs/A	FreeHand 1.75G @ 100-200 lbs/A or 2.3-4.6 lbs/1,000 sq ft	Annual grasses, spurge, chickweed, oxalis, groundsel, bittercress, eclipta. Suppression of <i>Phyllanthus</i> , doveweed, yellow nutsedge, annual sedges.	Labeled for commercial nursery and landscapes. Broad spectrum herbicide with several weeds listed on the product label. Controls yellow nutsedge and annual sedges. May be applied to annual bedding plants. Consult product label.
flumioxazin @ 0.38 lb/A	Broadstar 0.25 G @ 150 lbs/A; 3.44 oz/1,000 sq ft	Doveweed, liverwort, bittercress, spurge, other broadleaf weeds.	Apply at preemergence. Provides eight to 12 weeks of control. Several trees, shrubs and groundcovers are listed as tolerant. Container and field-grown plants only. Some potential for injury. Consult product label for tolerant plant species. Has some preemergence activity on <i>Phyllanthus</i> (chamberbitter).
flumioxazin @ 0.25-0.38 lb/A	Sureguard 51 WG @ 8-12 oz/A or 0.18-0.28 oz/1,000 sq ft	Doveweed, liverwort, bittercress, spurge, other broadleaf weeds.	Provides preemergence and some postemergence control. Container and field production of several woody ornamentals. For commercial ornamental production: good fit for field production as a directed spray. Useful in container nurseries to maintain weed free production areas. Same active ingredient that is found in the granular herbicide Broadstar. (Broadstar is a better fit for container use). Excellent pre- and post- control of doveweed. Can be used as directed sprays in commercial or residential landscapes around woody ornamentals. Apply at least 30 days after planting new woody transplants. Consult supplemental label.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
flumioxazin + prodiamine @ 0.875 lb/A	Fuerte 0.875 G @ 100 lbs/A	Several broadleaf weeds including doveweed and annual grasses.	Excellent preemergence control of many broadleaf weeds as well as annual grasses. Labeled for container and landscapes. Do not use on herbaceous plants.
Indaziflam @ 0.022-0.044/A	Marengo @ 100-200 lbs/A or 2.3-4.6 lbs/1,000 sq ft	Several annual grasses and broadleaves.	Container and field grown crops. Do not apply to in landscape plantings. May be applied in greenhouses when no crop is present.
indaziflam @ 0.03-0.05 lbs/A	Specticle Flo @ 6-12 oz/A or 0.14-0.28 oz/ 1,000 sq ft	Highly effective on crabgrass and other annual grasses. Good control of several small-seeded broadleaves.	Apply as directed spray in landscapes established for at least four months. For best results, apply before mulching. Do not use in or around bedding plants or herbaceous perennials. Herbicide is useful for hardscapes such as graveled areas. Do not exceed 18.5 oz/A/12-month period.
isoxaben @ 0.5-1.0 lb/A	Gallery 75DF @0.66-1.33 lbs/A or 0.24-0.48 oz/1,000 sq ft	Several broadleaves, such as spurge, common purslane, pigweed, chickweed, oxalis, suppression of chamberbitter.	Several perennial groundcovers and woody ornamentals are tolerant in landscape plantings. Safe on several container trees and shrubs. Consult label for tolerant ornamental species and susceptible weeds. Application rates based on weed and ornamental species. One of the better broadleaf weed herbicides but does not control annual grasses and should be tank-mixed with another herbicide for broad spectrum weed control. Do not apply to annual beds.
isoxaben + dithiopyr @ 1.125 lbs/A	Fortress @ 150 lbs/A or 3.4 lbs/1,000 sq ft	Several broadleaves, such as spurge, common purslane, pigweed, chickweed, oxalis, suppression of chamberbitter.	Use in container and field grown crops. Not labeled for landscape plants. Consult label for tolerant ornamental species and susceptible weeds.
isoxaben + oxyfluorfen + trifluralin @ 1.25-2 lbs/A	Showcase @ 100-200 lbs/A or 2.3-4.6 lbs/1,000 sq ft	Annual grasses, several hard-to-control broadleaves including eclipta.	Many container and field grown ornamentals are tolerant. Consult product label for tolerant ornamental species and susceptible weeds. Can be used for landscapes, field and container production. Excellent broad spectrum weed control. Improved control of <i>Phyllanthus</i> . Do not apply to bedding plants.
isoxaben + prodiamine @ 1.25-2.5 lbs/A	Gemini 3.7 SC @ 43.5-87 oz/A or 1-2 oz/1,000 sq ft; Gemini 0.65 G @ 100-200 lbs/A or 2.3-4.6 lbs/1,000 sq ft	Annual grasses, broadleaves. Chamberbitter suppression.	Prodiamine improves longevity of control on annual grasses over Snapshot. Excellent on several broadleaf weeds. For container, field, and landscape application. Check label for tolerant ornamental species and list of susceptible weeds. Do not apply to bedding plants.
isoxaben + trifluralin @ 2.5-5.0 lbs/A	Snapshot 2.5 TG and generics @ 100-200 lbs/A or 2.3-4.6 lbs/1,000 sq ft	Annual grasses, broadleaves. Chamberbitter suppression.	Several perennial groundcovers and woody ornamentals are tolerant. Consult product label for tolerant ornamental species and susceptible weeds. Several herbaceous species listed. Can be used for landscapes, field and container production. Excellent broad spectrum weed control; however, poor to fair on <i>Phyllanthus</i> . Do not apply to bedding plants.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
napropamide @ 4-6 lbs/A	Devrinol 50WP @ 8-12 lbs./A or 3-4.4 oz/1,000 sq ft; Devrinol 5G @ 43-87 lbs/A or 1-2 lbs./1,000 sq ft	Annual grasses, broadleaves.	Several species of deciduous and evergreen trees and shrubs. Container grown <i>Juniperus</i> , <i>Rhododendron</i> , <i>Pittosporum</i> , <i>Euonymus</i> are common tolerant ornamentals. Check label for tolerant ornamental species and list of susceptible weeds. Mechanically incorporate or apply irrigation immediately to activate. Also labeled for highways, industrial and foundation plantings.
metolachlor @ 1.2-2.45 lbs/A	Pennant Magnum 7.62 EC @1.3-2.6 pt/A or 0.48-0.96 oz/1000 sq ft	Annual grasses, yellow nutsedge, some annual sedges small-seeded broadleaves.	Registered for commercial ornamental production and landscape areas. Several tolerant ornamentals including many annual and perennial landscape plants. Check label for tolerant ornamental species and susceptible weeds. Rates vary for different soil types and control time desired. Similar weed control spectrum as Pendulum but additionally controls yellow nutsedge. Does not control purple nutsedge.
oryzalin @ 2.0-4.0 lb /A	Surflan 4 AS @ 2-4 qt/A or 1.5-3.0 oz/1,000 sq ft	Annual grasses, some small-seeded broadleaves.	Labeled for commercial nursery production and landscape beds. Several tolerant annual and perennial ornamentals. Slightly more injury potential with this herbicide than similar herbicides (Pendulum, Barricade etc.) because product is more water soluble. Consult product label. Rain or irrigation needed to activate. Low rate: two to four months control. High rate: six to eight months control.
oxadiazon @ 2-4 lbs/A	Ronstar 2 G @ 100-200 lbs/A or 2.25-4.5 lbs/1,000 sq ft	Annual grasses, broadleaves; weak on chickweed.	Check label for tolerant ornamental species and susceptible weeds. Injury has been observed on ajuga, liriopie and mondograss. Wash granules off foliage. Not labeled for residential areas.
oxyfluorfen @ 0.25-1.0 lb/A	Goal T/O 1.6E @1.25-5 pts/A or 0.46-1.84 oz/1,000 ft2	A few annual grasses, several broadleaves, including bittercress.	Apply at preemergence in conifers and several field grown trees. Herbicide has some postemergence activity. Good activity on several broadleaf weeds including winter annuals.
oxyfluorfen + pendimethalin @ 2 lbs/A	OH II 2 G @ 100 lbs/A or 2.3 lbs/1,000 sq ft	Annual grasses, Spurge, chickweed, oxalis, groundsel, bittercress, eclipta.	For container and field-grown ornamentals. Check label for tolerant ornamental species and susceptible weeds. Can be used for container or field-grown ornamentals. Excellent control of several hard to manage weeds. Some suppression of <i>Phyllanthus</i> species. Do not use on bedding plants.
pendimethalin @ 1.7-3.0 lbs/A	Pendulum 3.3 EC @ 3.6-4.8 pt/A or 1.3-1.8 oz/1,000 sq ft; Pendulum AquaCap 3.8 @ 3.1-6.2 pt/A or 1.15-2.3 oz/1,000 sq ft; Pendulum 2G @ 75-150 lbs/A or 1.7-3.4 lbs/1,000 sq ft	Annual grasses, broadleaves.	Most annual and perennial ornamentals are tolerant. Can be used in landscape beds due to good ornamental tolerance. Consult label for list of tolerant plants.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
prodiamine @ 0.65-0.75 lb/A	Barricade 65WG and Regalkade 65 WG @ 1.0-1.15 lbs./A or 0.36-0.42 oz/1,000 sq ft	Grasses and small-seeded broadleaves like pigweed, spurge and purslane.	Labeled for commercial nursery production as well as landscape beds. Can be used in perennial and wildflower plantings. Use higher rate of application for longer control. Do not exceed 2.3 lbs/A annually. Useful in landscape beds and safe on several annual and perennial bedding plants. Similar weed control spectrum as Surflan and Pendulum but longer residual.
pronamide @ 1.0-2.0 lbs/A	Kerb 50 WSP @ 2.0-4.0 lbs/A; Kerb SC @ 0.9-1.8 oz/1,000 sq ft	Grasses, some broadleaves.	Apply at preemergence and has some postemergence activity on annual bluegrass. Check label for tolerant ornamental species and susceptible weeds. RESTRICTED USE.
simazine @ 2.0-4.0 lbs/A	Princep 4L @ 2-4 qt/A or 0.73-2.20 oz/1,000 sq ft	Annual grasses, winter broadleaves.	Several field-grown conifers, including Christmas trees and deciduous trees. Apply in at least 25 GPA in fall or spring. Do not apply to plantings less than 1 year old. Do not apply to landscape beds.

Table 2. Postemergence herbicides.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
clopyralid @ 0.09-0.50 lb/A	Lontrel 3 EC @ 0.25-1.33 pt/A or 0.125-0.5 oz/1,000 sq ft	Legumes, asters, thistles.	Labeled for use in certain woody trees and shrubs as over-the-top or directed sprays in field nurseries and landscape plantings. May also be used in field-grown lilies. Apply no more than 1.33 pt/A per season. Mimosa, redbud, locust will be injured or killed by Lontrel. Do not apply to residential landscape plantings or container ornamentals.
oxyfluorfen @ 0.25-0.50 lb/A	Goal T/O 1.6E @ 0.46-0.92 oz/1,000 ft ² or 1.25-2.5 pts/A	Annual grasses, broadleaves including bittercress, chickweed.	Control of small actively growing weeds in conifers and several field-grown trees. Works by contact so good coverage is a must.
flumioxazin @ 0.25-0.38 lb/A	Sureguard 51 WG @ 8-12 oz/A or 0.18–0.28 oz/1,000 sq ft	Doveweed, bittercress, spurges, other broadleaf weeds.	Apply at preemergence and postemergence. Container and field production of several woody ornamentals. For commercial ornamental production: good fit for field production as a directed spray. Useful in container nurseries to maintain weed-free production areas. Same active ingredient that is found in Broadstar. Excellent pre- and post-control of doveweed. Can be used as directed sprays in commercial or residential landscapes around woody ornamentals. Apply at least 30 days before new woody transplants.

Table 3. Grass killing postemergence herbicides.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
fenoxaprop @ 0.1-0.3 lb/A	Acclaim1EC @ 4-45 oz/A 0.34-1.0 oz/1,000 sq ft	Annual grasses, suppression of perennial grasses.	Apply postemergence. Apply herbicide to actively growing grasses. More active on annual than perennial grasses. Can be used over the top of many herbaceous and woody ornamentals. Ornamental grasses may be injured or killed. Check label for recommended uses.
sethoxydim @ 0.3-0.5 lb/A	Segment II 1.5 EC @ 1.5- 2.5 pt/A or 0.60-0.90 fl oz-/1,000 sq ft	Annual and perennial grasses.	Herbicide only controls grasses. Several non-grass ornamentals are tolerant for over-the-top applications but consult product label for sensitive plants. Avoid using Segment II with adjuvants at temperatures above 90 F and relative humidity is at or above 60%, or any time the temperature exceeds 100 F, as injury may result. Poor activity on torpedograss.
clethodim @ 0.125-0.25 lb	Various trade names 0.94EC @ 17-34 oz/A or 0.39-0.78/1,000 sq ft	Annual and perennial grasses.	Apply postemergence for actively growing grasses. Add 0.25% v/v non-ionic surfactant (1 pt/50 gal). Crop oil concentrate not recommended. Slightly better on perennial grasses than sethoxydim.
fluzafop @ 0.25-0.40 lb/A	Fusilade II EC @ 17-26 oz/A; Spot sprays 0.75 oz/gallon	Annual and perennial grasses. Effective on vaseygrass. Some suppression of torpedograss with repeated applications.	Herbicide only controls grasses. Several non-grass ornamentals are tolerant for over-the-top applications but consult product label for sensitive plants. Restrictions on juniper and azalea cultivars. Somewhat more effective on torpedograss and bermudagrass with multiple applications versus sethoxydim. Add a NIS at 0.25% v/v.

Table 4. Sedge killing herbicides for landscape.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
bentazon @ 0.75-1.0 lb/A	Basagran T/O 4L @ 1.5-2.0 pts/A or 0.5 -0.75 oz/1,000 sq ft	Yellow nutsedge, annual sedges and green kyllinga with repeated applications.	Postemergence directed spray in many established ornamental beds. Not systemic so weed coverage is very important. Will not control purple nutsedge. Control optimized by a second application within 10 days. Check label for recommended uses. Crop oil will increase activity.
halosulfuron @ 0.03-0.06 lb/A	Sedgehammer 75 WDG and others @ 0.6-1.33 oz/A or 0.138-0.03 oz/1,000 sq ft; 0.25 teaspoon/gal spot spray	Nutsedges (purple and yellow); suppression of kyllinga species.	Apply as a directed spray around woody ornamentals in landscape plantings. Very effective on yellow and purple nutsedge. Add a non-ionic surfactant.
imazaquin @ 0.38-0.5 lb/A	Scepter 70 DG @ 8.6-11.4 oz or 0.2-0.26 oz/1,000 sq ft	Suppresses green kyllinga, yellow and purple nutsedge; weaker on yellow nutsedge; good on purple nutsedge; broadleaves, suppression of dollarweed.	Landscape use only. Check label for tolerant ornamental species and susceptible weeds. Limited number of ornamentals that will tolerate over-the-top applications on label. Liriope and mondograss will tolerate certain rates in over-the-top applications. Azaleas may be injured by this herbicide.
sulfosulfuron @ 0.05-0.09 lb/A	Certainty 75 WG @ 1.25-2.0 oz/A or 0.03-0.04 oz/1,000 sq ft; Apply with non-ionic surfactant.	Yellow and purple nutsedge, green kyllinga, johnsongrass.	Sedge control in ornamentals. Apply as a directed spray around woody ornamental. Several landscape and field nursery plants will tolerate over-the-top applications. Consult product label.

Table 5. Nonselective herbicides.

Active Ingredient and Rate	Formulated Product and Rate	Weeds Controlled	Remarks and Precautions
glyphosate @ 1.0-5.0 lbs/A	Roundup Pro 41% and generics @ 1-5 qt/A or 1.5-3.7 oz/1,000 ft ² ; Use 2% solution for spot treatments. Use a 10% solution for dollarweed, torpedograss and other hard to control perennials infesting landscape beds.	Grasses, broadleaves	Check label for recommended uses. Nonselective so avoid all drift. Labeled for greenhouse use. Consider wiping or paint brushing a 10% v/v solution instead of spraying in landscape beds for difficult weeds such as dollarweed, Florida betony and torpedograss.
potassium salt	Sharpshooter 18% @ 5.5-11 oz/qt/water	Grasses, broadleaves	Apply postemergence. Check label for recommended uses. Nonselective. Apply to young, succulent, actively growing weeds. Labeled for greenhouse use. Good activity on small annual weeds. Very poor control on perennial weeds.
paraquat @ 0.6-0.9 lb/A	Gramoxone Extra 2.8 L @ 2 – 3 pt/A; 0.73 oz – 1 oz /1000 ft ²	Annual grasses, broadleaves	Directed postemergence application in field produced woody ornamentals. Check label for recommended uses. Nonselective. Poor on perennial weeds. RESTRICTED USE. Users must complete an EPA approved training before mixing and applying this herbicide.
diquat @ 0.25-0.50 lb/A	Reward 2 L @ 1 – 2 pt/A or 0.36 – 0.73 oz	Most annual grasses and broadleaves	Contact herbicide labeled for use in commercial greenhouses and nurseries. Post-directed in field ornamentals. Good coverage is a must. Add a non-ionic surfactant at 0.25% v/v. Poor on perennial weeds.
glufosinate ammonium @ 0.75-1.5 lbs/A	Finale 1 SL and others @ 3-6 qt/A or spot treatment 1.5-4.0 oz/gal	Nonselective control of several grasses and broadleaves	Mostly contact herbicide. Less effective on perennial plants due to limited translocation. Very good herbicide on escaped jasmine.
pelargonic acid	Scythe and other trade names @ 7 to 10% v/v	Nonselective control of several newly emerged grasses and broadleaves	Organic weed control option. Not effective on perennial weeds. May be tank-mixed with residual herbicides.

