

**CHEMICAL WEED CONTROL IN FRUIT CROPS**  
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NOTE: A mode of action code has been added to the Herbicide and Formulation column of this table. Use MOA codes for herbicide resistance management. See Table 8-11, Herbicide Resistance Management, for details.

**TABLE 8-13A. CHEMICAL WEED CONTROL IN FRUIT CROPS—SMALL FRUITS**

Crop	Weed	Herbicide, Mode of Action Code* and Formulation	Amount of Formulation Per Acre	Pounds Active Ingredient Per Acre	Precautions and Remarks	
BLUEBERRIES, RASPBERRIES, BLACKBERRIES, TRAILING-BLACKBERRIES	Annual grasses and broadleaf weeds	flumioxazin, MOA 14 (Chateau) 51 WDG	6 to 12 oz	0.19 to 0.375	<b>For blueberries only.</b> Do not apply to blueberries established less than 2 years unless they are protected from spray contact by nonporous wrap, grow tubes, or waxed containers. Do not apply after budbreak through final harvest. Do not apply more than 12 oz per acre during a 12-month period. Do not make a sequential application within 30 days of the first application. Do not apply more than 6 oz per application to bushes less than 3 years old on soils having a sand plus gravel content greater than 80%. Apply at the base of the bush. Chateau should be tank-mixed with a registered burndown herbicide to control emerged weeds. Residual weed control will be reduced if vegetation prevents Chateau from reaching soil surface.	
	Annual and perennial grass and broadleaf weeds	glyphosate, MOA 9 (various brands) 4 SL (various brands) 5 SL (Roundup WeatherMax) 5.5 L	1 to 3 pt 0.8 to 2.4 pt 11 to 32 oz	0.5 to 1.5	Apply to emerged weeds before crop transplanting. Perennial weeds may require higher rates of glyphosate. Roundup WeatherMax is not registered on raspberries. Consult the manufacturer's label for rates for specific weeds. See label for further instruction.	
	Annual broadleaf weeds	mesotrione, MOA 27 (Callisto) 4L	3 to 6 oz	0.094 to 0.185	<b>For blueberries only.</b> Callisto may be applied at a rate up to 6 oz per acre. May be applied as a split applications of 3 oz per acre followed by 3 oz per acre. If two application are made, do not apply less than 14 days apart. Do not apply more than 6 oz per acre per year. Do not apply after the onset of bloom stage or illegal residues may occur.	
	Annual grasses and small-seeded broadleaf weeds	napropamide, MOA 15 (Devrinol) 50 DF (Devrinol) 10 G	8 lb 40 lb	4	Apply to weed-free soil surface. Enough irrigation or rainfall to wet the soil to a depth of 4 in. is necessary within 24 hours of application. Apply as a directed spray to the base of the plants. May be used on first-year plantings. NOTE: Use only half this rate the first year if root pieces are planted.	
			norflurazon, MOA 12 (Solicam) 80 WDG	2.5 to 5 lb	2 to 4	Apply as a directed spray from fall to early spring when the crop is dormant and before weeds emerge. Also controls some seedling perennials. Make only one application per year. Blueberries must be established 6 months and raspberry and blackberry 12 months prior to Solicam use. Application of Solicam may result in temporary bleaching or chlorosis of the leaves. Preharvest interval is 60 days.
			oryzalin, MOA 3 (Oryzalin or Surflan) 4 AS	2 to 4 qt	2 to 4	This treatment may be used on first year plants.
	Annual broadleaf and grass weeds	diuron, MOA 7 (Karmex) 80 DF (Karmex XP) 80 DF (Direx) 4 L	1.5 to 2 lb 1.5 to 2 lb 1.2 to 1.6 qt	1.2 to 1.6	<b>For blueberries only.</b> Use only in fields that have been established for at least 1 year. Apply as a band treatment at the base of bushes. The addition of a surfactant will kill many small emerged weeds.	
			simazine, MOA 5 (Princep) 90 WDG (Princep) 4 L	2.2 to 4.4 lb 2 to 4 qt	2 to 4	Apply half the maximum annual application in the spring before buds break and weeds emerge, and half after harvest. Do not apply more than 1 lb a.i. simazine on newly planted blackberries, blueberries or raspberries.
	Most annual broadleaf and grass weeds plus many perennials	terbacil, MOA 5 (Sinbar) 80 WP	0.5 to 2 lb	0.4 to 1.6	Use in spring or after harvest either before weeds emerge or shortly after weeds emerge. Use only in plantings established 1 year or longer. Do not use on sandy soils with less than 3% organic matter. See label for further information.	
	Most annual and perennial weeds	hexazinone, MOA 5 (Velpar) 2 SL (Velpar) 80 WDG	0.5 to 1 gal 1.3 to 2.6 lb	1 to 2	<b>For blueberries only.</b> Apply as a directed spray to soil and weeds before blueberry leaf emergence but at least 90 days before harvest. Use lower rates on poorly drained or sandy soils. DO NOT USE ON FIRST YEAR PLANTINGS.	
Annual grasses	pronamide, MOA 3 (Kerb) 50 W	2 to 4 lb	1 to 2	<b>For blueberries only.</b> Apply as a directed spray in established blueberries only for early postemergence control of susceptible winter annual weeds, perennial grasses, and chickweed and for preemergence control of these and other weeds. DO NOT APPLY ON NEW PLANTINGS UNTIL ESTABLISHED. Do not exceed maximum rate listed per year. Apply only in late fall or winter.		
Annuals and many perennials	dichlobenil, MOA 20 (Casoron) 4 G (Casoron CS) 1.4 L	100 lb 1.4 to 2.8 gal	4 2 to 3.92	Apply in the early winter, no later than mid-February, to plants that have been established 1 year or longer. Casoron 4G may be used in blueberry planted at least 4 weeks earlier. Apply 100 lb only to blackberries and raspberries. Rate may increase to 150 lb per acre for blueberries.		

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Crop	Weed	Herbicide, Mode of Action Code* and Formulation	Amount of Formulation Per Acre	Pounds Active Ingredient Per Acre	Precautions and Remarks
<b>BLUEBERRIES, RASPBERRIES, BLACKBERRIES, TRAILING-BLACKBERRIES</b> (continued)	Most annual broadleaf and grass weeds and a few perennials	glufosinate, MOA 10 (Rely) 1 SL (Rely 200) 1.67 SL	3 to 5 qt 1.8 to 3 qt	0.75 to 1.5 0.75 to 1.25	<b>For blueberries only.</b> Apply as a directed application. Do not allow spray to contact or drift to desirable vegetation. Avoid contact with green or uncallused bark on young bushes or crop injury may occur. Do not apply within 14 days of harvest. See label for more information.
	Most annual broadleaf and grass weeds plus most perennials	glyphosate, MOA 9 (various brands) 4 SL (various brands) 5 SL (Roundup WeatherMax) 5.5 L	1 to 3 pt 0.8 to 2.4 pt 11 to 32 oz	0.5 to 1.5	DO NOT SPRAY GREEN CANES, BARK, OR FOLIAGE. Apply as a directed shielded spray to base of established plants. Do not apply within 14 days of harvest. Wiper applications may also be used. Perennial weeds may require higher rates of glyphosate. Certain glyphosate formulations require the addition of a surfactant. See label for specific rates for herbicide and surfactant. Roundup WeatherMax is not registered on raspberries.
	Contact kill of all green foliage	paraquat, MOA 22 (Firestorm) 3 SL (Gramoxone Inteon) 2 SL	1.3 to 2.7 pt 2 to 4 pt	0.56 to 1	Apply as a directed spray in a minimum of 50 gal per acre spray mix to weeds before new canes emerge. Avoid paraquat contact with new canes, as injury will occur. Direct spray with low pressure to produce a coarse spray. Add a nonionic surfactant at a rate of 16 to 32 oz per 100 gal of spray mix, or 1 gal approved crop oil concentrate per 100 gal spray mix.
	Broadleaf weeds, including morningglory, pigweed, lambsquarters, cocklebur, smartweed, and dayflower	carfentrazone-ethyl, MOA 14 Aim 2EC	1 to 2 oz	0.015 to 0.031	Apply as a hooded spray with application equipment designed to prevent spray deposit on green stems, leaf tissue, flowers, or fruit. Use in established fields only; do not use on newly set plants. May be used alone or tank-mixed with other herbicides. Add crop oil concentrate at 1% by volume (1 gal/100 gal of spray solution) or a nonionic surfactant at 0.25% by volume (1 qt/100 gal of spray solution).
	Yellow nutsedge and some broadleaf weeds	bentazon, MOA 6 (Basagran) 4SL	1.5 to 2 pt	0.75 to 1	NONBEARING ONLY. For yellow nutsedge control, two applications may be needed. Apply when plants are 6 to 8 in. tall. If needed, make a second application at the same rate 7 to 10 days later. Add oil concentrate to the spray solution at a rate of 2 pt in 20 to 50 gal of water per acre.
	Annual and perennial grasses	clethodim, MOA 1 (Select) 2 EC (Select Max) 1 EC	6 to 8 oz 9 to 16 oz	0.09 to 0.125 0.07 to 0.125	USE ON NONBEARING CROP ONLY. Postemergence grass control. Very effective in controlling bluegrass. Add 1% crop oil concentrate to all sprays. Do not apply within 1 year of harvest. See label for all other instructions.
		fluzifop, MOA 1 (Fusilade DX) 2 EC	16 to 24 oz	0.25 to 0.38	USE ON NONBEARING CROP ONLY. Postemergence grass control. Check label for specific rates and timings. Do not apply within 1 year of the first harvest. Use of a crop oil or surfactant will be necessary. Sequential applications are necessary for adequate control of perennial grasses.
sethoxydim, MOA 1 (Poast) 1.5 EC		1.5 to 2.5 pt	0.3 to 0.5	Postemergence grass control. Check label for specific rates and timings. Use a crop oil at a rate of 1 qt per acre. May be used on bearing blueberries, raspberries, or blackberries, but not within 30, 45, or 45 days, respectively, of harvest.	
<b>GRAPES</b> Preemergence Directed Underneath Vines	Annual broadleaf weeds	oxyfluorfen, MOA 14 (Galigan, Goal 2 XL, or OxiFlo) 2 EC (GoalTender) 4 E	5 to 8 pt 2.5 to 4 pt	1.25 to 2	Use only on dormant grapes for preemergence or postemergence control of weeds. Direct spray to the base of the plant. Do not apply after buds start to swell or when foliage or fruit is present. Do not apply to grapes established less than 3 years unless vines are on a trellis wire at least 3 ft above the soil surface. Goal may be tank mixed with Kerb, Devrinol, Princep, Surflan, paraquat, or Roundup. Observe all precautions for each of these herbicides.
	Annuals and many perennials	dichlobenil, MOA 20 (Casoron) 4 G (Casoron CS) 1.4 CS	100 to 150 lb 1.4 to 2.8 gal	4 to 6 2 to 4	Do not apply within 4 weeks of transplanting. Apply in January and February. High rate is necessary for perennial weed control. Vines must be established at least 1 yr before using.
	Annual broadleaf and grass weeds	simazine, MOA 5 (Princep Simazine) 90 WDG (Princep Simazine) 4 L	2.2 to 4.4 lb 2 to 4 qt	2 to 4	Apply before germination of annual weeds. Do not apply in vineyards less than 3 years old. Tank mix with glyphosate, paraquat, or Rely for POST weed control.
	Annual grasses and some broadleaf weeds	diuron, MOA 7 (Diuron, Karmex DS, Karmex XP)	2 to 3 lb	1.6 to 2.4	Apply before germination of annual weeds. Vineyards must be at least 3 years old. Higher rate may be used on soils with greater than 2% organic matter and high clay content. Do not use on sandy loam or coarser soils. Tank mix with glyphosate, paraquat, or Rely for POST weed control. Applications in vineyards having less than 2% organic matter may cause injury if heavy rainfall occurs soon after application. This risk is assumed by user.

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<b>GRAPES Preemergence Directed Underneath Vines</b> (continued)	Annual grasses and small-seeded broadleaf weeds	flumioxazin, MOA 14 (Chateau) 51 WDG	6 to 12 oz	0.19 to 0.375	Apply with hooded or shielded application equipment. Grapes established less than 2 years must be shielded from contact with spray solution using grow tubes. Do not treat bearing grapes used for juice or wine after budbreak through final harvest unless using shielded application equipment and applicator so that no drift will contact crop fruit or foliage. Do not use in table grapes except after final harvest up to budbreak. When using after budbreak, only tank mix with paraquat or Rely. Do not tank mix with glyphosate after budbreak occurs. Do not apply more than 6 oz per acre per application to vines less than 3 years old on soils having a sand plus gravel content greater than 80%. DO NOT apply sequential applications closer than 30 days apart.
		oryzalin, MOA 3 (Oryzalin, Surflan) 4 AS	2 to 4 qt	2 to 4	Apply once soil has settled after transplanting. Multiple applications per year are permitted; see label for details. Apply in combination with Gallery in newly planted vineyards for improved control of broadleaf weeds.
		pendimethalin, MOA (Prowl) H <sub>2</sub> O 4E	2 to 6.3 qt	2 to 6	Use on nonbearing grapes only. Allow soil to settle around vines before application. Apply only to dormant, newly planted, and 1-year-old vines. Do not apply after buds have started to swell. Do not apply over the top of vines. In bearing vineyards, Prowl may be applied anytime after harvest, through winter, and in the spring. Use rate cannot exceed 6.3 qt/A per year. Prowl H <sub>2</sub> O has a 90-dat PHI.
		norflurazon, MOA 12 (Solicam) 80 WDG	1.25 to 5 lb	1 to 4	Vines must be established at least 2 years in the field before application. DO NOT use on nursery stock. Loss of pigment in leaf veins will occur in coarse-textured soils when applied within 3 months after budbreak. Rate is soil-texture dependent. 60-day PHI.
	Annual grasses and broadleaf weeds	oryzalin, MOA 3 (Oryzalin, Surflan) 4 AS + simazine, MOA 5 (Princep) 90 WDG (Princep) 4 L	2 to 4 qt + 2.2 to 4.4 lb 2 to 4 qt	2 to 4 + 2 to 4	Tank mix for use before weed emergence. See comments for oryzalin and simazine.
	Broadleaf weeds and some annual grasses	rimsulfuron, MOA 2 (Matrix FNV) 25 WG	4 oz	0.063	Matrix FNV has POST and PRE activity on broadleaf and some grass weeds. For broad spectrum residual control, tank mix Matrix FNV with oryzalin. For nonselective POST weed control, tank mix Matrix with glyphosate, paraquat, or Rely. Do not treat vineyard established less than 1 year. Rainfall for herbicide activation is necessary within 2 to 3 weeks of application. Do not apply within 14 days of harvest. The pH of spray solution should be in the range of 4 to 8. Matrix FNV may be applied as a sequential application so long as total use rate does not exceed 4 oz/A per year and application is made in band to less than 50% of vineyard floor.
<b>GRAPES Postemergence, Directed Underneath Vines</b>	Contact kill of all green foliage	paraquat, MOA 22 (Firestorm) 3 SL (Gramoxone Inteon) 2 SL	1.7 to 2.7 pt 2.5 to 4 pt	0.66 to 1	Apply in 20 gal per acre spray mix when grass and weeds are 1 to 6 in. high and succulent for best results. Direct spray with low pressure to avoid contact with foliage or bark less than 1 year old. Add a nonionic surfactant at a rate of 16 to 32 oz per 100 gal of spray solution. May be used for sucker suppression. See label for details.
	Most annual broadleaf and grass weeds plus most perennials	glyphosate, MOA 9 various brands and formulations)	See label	1 to 2	DO NOT SPRAY GREEN BARK OR FOLIAGE. Apply preplant or as a directed spray to base of established vines. Do not treat within 14 days of harvest. Wiper applications may also be used. Perennial weeds may require higher rates of glyphosate. See label for specific rates. Do not apply in late summer or fall. Some formulations may require the addition of a surfactant.
		glyphosate + carfentrazone, MOA 9 and 14 (Rage)	20 to 40 oz	0.78 to 1.58	Apply with hooded sprayer. PHI 14 days. Do not allow spray to contact green stems, leaves, fruit, or any other desirable vegetation. Apply in combination with non-ionic surfactant at 0.25% v/v or crop oil concentrate at 1% v/v. The addition of ammonium sulfate at 2 to 4 lb per acre will enhance herbicide activity.
	Most annual weeds and a few perennials	glufosinate, MOA 10 (Rely 200) 1.67 SL	58 to 96 oz	0.75 to 1.25	Apply as a directed spray to emerged weeds in a minimum of 20 gal water per acre with a minimum of 30 psi spray pressure when weeds are 1 to 6 in. high. For spot application, use 1.5 to 4 oz per gal of water and spray to wet but not runoff. Do not allow spray to contact desirable foliage or green bark. Do not apply within 14 days of harvest. See label for specific rates. Rely can also be used for sucker control—see label for directions. Do not apply more than 10 qt/acre.

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<b>GRAPES</b> Postemergence, Directed Underneath Vines (continued)	Annual broadleaf weeds	carfentrazone-ethyl, MOA 14 (Aim) 2 EC	1 to 2 oz	0.016 to 0.031	Apply as a directed spray or as a hooded spray. DO NOT allow spray solution to contact green tissue, leaves, flowers, or fruit. Aim may be used alone or tank mixed with other herbicides; see label for tank mixing instructions. Aim controls cocklebur, pigweed, nightshade, velvetleaf, carpetweed, and spreading dayflower. Do not apply within 3 days of harvest. Apply in minimum spray volume of 20 GPA. Apply in combination with crop oil concentrate at 1% v/v (1 gal/100 gal of spray solution) or a nonionic surfactant at 0.25% v/v (1 qt/100 gal of spray solution). Do not use on newly transplanted vines.
	Annual and perennial grasses	clethodim, MOA 1 (Arrow, Select, and others) 2 EC (Select Max and others) 1 EC	6 to 8 oz 9 to 16 oz	0.07 to 0.125	USE ON NONBEARING CROP ONLY. Postemergence grass control. Very effective in controlling bluegrass. Do not apply within 1 year of harvest. See label for all other instructions. Sequential applications necessary for adequate control of perennial grass weeds. Always apply 80% active ingredient nonionic surfactant at a rate of 0.25% volume per volume (1 pt/50 gal of spray).
		fluazifop, MOA 1 (Fusilade DX) 2 EC	16 to 24 oz	0.25 to 0.38	USE ON NONBEARING CROP ONLY. Postemergence grass control. Check label for rates and timings for specific weeds. Do not apply within 1 year of the first harvest. Use of a crop oil or surfactant will be necessary. Sequential applications necessary for adequate control of perennial grass weeds.
	Annual and perennial grasses (continued)	sethoxydim, MOA 1 (Poast) 1.5 EC	1.5 to 2.5 pt	0.3 to 0.5	Postemergence grass control. Check label for rates and timings for specific grasses. Use a crop oil at a rate of 1 qt per acre. Do not apply within 50 days of the first harvest. Sequential applications necessary for adequate control of perennial grass weeds.
<b>STRAWBERRIES</b> (matted row)	Most annual and perennials	methyl bromide	various	240	Inject in the soil 4 to 6 in. deep and cover with tarp immediately. Soil moisture should be near field capacity and soil temperature should be at least 50° F at treatment depth. Allow at least 2 weeks after treatment before transplanting. If tarp is removed, disking before planting will facilitate aeration.
	Most annual grasses and small-seeded broadleaf weeds	DCPA, MOA 3 (Dacthal) W-75 (Dacthal) 6 F	8 to 12 lb 8 to 12 pt	6 to 9	Apply over the top of newly planted transplants or in fall or early spring for preemergence weed control. Do not apply after first bloom through harvest.
		napropamide, MOA 15 (Devrinol) 50 WDG (Devrinol) 10 G (Devrinol) 2 EC	4 to 8 lb 40 lb 8 qt	2 to 4	Apply to established plants before weed emergence anytime, except the interval between bloom and harvest. Irrigation or mechanical incorporation is essential within 1 week after application.
	Most annual broadleaf weeds and grass weeds	terbacil, MOA 5 (Sinbar) 80 WP	2 to 6 oz	0.1 to 0.3	<b>For preemergence control of most weeds.</b> For planting year: apply 2 to 3 oz of Sinbar per acre after transplanting but before new runner plants start to root. If strawberry transplants are allowed to develop new foliage prior to Sinbar application, apply 0.5 to 1 in. irrigation or rainfall immediately after application. For control of winter weeds: apply 2 to 6 oz Sinbar per acre in late summer or early fall. If crop is not dormant, the application must be followed immediately by 0.5 to 1 in. irrigation or rainfall. To extend weed control through harvest of the following year, apply 2 to 4 oz Sinbar per acre just prior to mulching in the late fall. For harvest years: after postharvest renovation and before new growth begins in midsummer, apply 4 to 6 oz of Sinbar per acre. To extend weed control through harvest of the following year, apply 4 to 6 oz of Sinbar per acre just prior to mulching in late fall. Do not apply within 110 days of harvest. See label for more information.
	Broadleaf weeds including clover, dock, sowthistle, thistle, and vetch	clopyralid, MOA 4 (Stinger) 3 EC	0.33 to 0.67 pt	0.125 to 0.25	Apply postemergence in spring or postharvest to control emerged broadleaf weeds in established strawberries. Do not use surfactant or use with other pesticides. Do not apply within 30 days of harvest.
	Annual broadleaf weeds	2,4-D amine, 4 (Amine 4 2,4-D Weed Killer) 4 SL	2 to 3 pt	1 to 1.5	Apply to well-established strawberries after harvest and before runners form or when crop is dormant for postemergence control of weeds. Not more than two treatments per year. Do not apply during bud, flower, or fruit stage. Timing is very critical to avoid damage. Do not apply unless possible injury to crop is acceptable.

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<b>STRAWBERRIES (matted row)</b> (continued)	Annual broadleaf weeds (continued)	flumioxazin, MOA 14 (Chateau) 51 WDG	3 oz	0.09	Apply to dormant strawberries for the preemergence control of weeds. Crop oil concentrate at 1% v/v or nonionic surfactant at 0.25% v/v may be added to help control emerged broadleaf weeds. <b>Row middles.</b> Do NOT apply over strawberries. Apply prior to weed emergence. Crop spotting may occur if an adjuvant is used. DO NOT APPLY AFTER FRUIT SET.
	Contact kill of all green foliage	paraquat, MOA 22 (Firestorm) 3 SL (Gramoxone Inteon) 2 L	1.3 pt 2 pt	0.5 to 1	For control of emerged broadleaf and grass weeds, use shields and direct spray between the rows to prevent contact with strawberry foliage. Use a nonionic surfactant at a rate of 16 to 32 oz per 100 gal spray mix or 1 gal approved crop oil concentrate per 100 gal spray mix. Do not apply within 21 days of harvest.
	Annual and perennial grasses only	clethodim, MOA 1 (Select) 2 EC (Select Max) 1 EC	6 to 8 oz 9 to 16 oz	0.094 to 0.125 0.07 to 0.125	Apply postemergence for control of emerged grasses in strawberries. With Select, add 1 gal crop oil concentrate per 100 gal spray mix. With Select Max, add 0.25% nonionic surfactant, 1 qt per 100 gal spray mix. Very effective in controlling annual bluegrass. Apply to actively growing grasses not under drought stress. Do not apply within 4 days of harvest.
		fluzifop, MOA 1 (Fusilade DX) 2 EC	16 to 24 oz	0.25 to 0.38	USE ON NONBEARING CROP ONLY. Postemergence grass control. Check label for rates and timings for specific weeds. Do not apply within 1 year of the first harvest. Use of a crop oil or surfactant will be necessary.
		sethoxydim, MOA 1 (Poast) 1.5 EC	1 to 1.5 pt	0.2 to 0.3	Apply to emerged grasses. Consult manufacturer's label for specific rates and best times to treat. Add 1 qt of crop oil concentrate per acre. Do not apply on days that are unusually hot and humid. Do not apply within 7 days of harvest.
<b>STRAWBERRIES (plastic culture)</b>	Most annual and perennial weeds	methyl bromide (various brands)	See label	See label	Inject into the soil 4 to 6 in deep and cover with black plastic immediately. Soil moisture should be near field capacity and soil temperature should be at least 50°F at the treatment depth. Allow 2 weeks after application before transplanting.
	Broadleaf weeds	acifluorfen, MOA 14 (UltraBlazer) 2 L	0.5 to 1.5 pt	0.125 to 0.375	<b>Crop row.</b> Make one banded application before laying plastic mulch and after final land preparation, and prior to transplanting the crop. For best results, avoid soil disturbance during laying of plastic and planting of crop. <b>Row middles between plastic mulch rows.</b> Apply as a direct-shielded application to strawberry row middles between mulched beds. DO NOT ALLOW ULTRABLAZER TO CONTACT STRAWBERRY PLANTS. Limited research has been conducted with UltraBlazer in North Carolina
	Annual grasses and broadleaf weeds	napropamide, MOA 15 (Devrinol) 2 EC (Devrinol) 50 DF	8 qt 8 lb	4	Devrinol applied to bed before laying the plastic has potential to injury strawberry plants. For plantbed treatment, preplant incorporate to weed-free soil before laying plastic mulch. Soil should be well worked yet moist enough to permit a thorough incorporation to a depth of 2 in. incorporated within 24 hours of application before laying of plastic mulch. If weed pressure is from small-seeded annuals, apply Devrinol to the surface of the bed immediately in front of the laying of the plastic mulch. If soil is dry, water or sprinkler irrigate with sufficient water to wet to a depth of 2 to 4 in. before covering with plastic mulch. Lay the plastic mulch over the treated soil on the same day as the Devrinol application.
	Broadleaf weeds including Carolina geranium and cutleaf eveningprimrose, and a few annual grasses	oxyfluorfen, MOA 14 (Goal) 2 XL	Up to 2 pt	Up to 0.5	Apply to the soil surface of pre-formed beds at least 30 days prior to transplanting crop for control of many broadleaf weeds that will emerge from hole near crop. While incorporation is not necessary, it may result in less crop injury. Soil disturbance after application will reduce weed control. Plastic mulch can be applied any time after applying Goal, but best results are likely if it is applied soon after Goal.
	Annual broadleaf weeds including cutleaf evening primrose and some annual grasses	flumioxazin, MOA 14 (Chateau) 51 WDG	3 oz	0.096	<b>Crop row.</b> Apply a minimum of 30 days prior to transplanting and prior to plastic mulch being laid. Apply as part of a tank mix to control emerged weeds. Limited research has been conducted in North Carolina. <b>Row middles between plastic mulch rows.</b> Apply only to row middles. DO NOT APPLY over strawberries. Apply prior to weed emergence and prior to fruit set. Crop spotting may occur if an adjuvant is added. Application after fruit set may result in spotting of fruit and should be avoided. Do not allow spray drift to come in contact with fruit or foliage.

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<b>STRAWBERRIES (plastic culture)</b> (continued)	Annual grasses and small-seeded broadleaf weeds	napropamide, MOA 15 (Devrinol) 50 DF (Devrinol) 2EC	8 lb 8 qt	4	Apply as a banded preemergence treatment to the middles between plastic before weed emergence. Tank mixture with paraquat will provide pre- and postemergence weed control. Rainfall or irrigation within 24 hr after Devrinol application is needed for optimum control. Effective on volunteer small grains (wheat, etc.) if applied before emergence.
	Annual broadleaf weeds	carfentrazone-ethyl, MOA 14 (Aim) 1.9 EW or 2 EC	up to 2 oz	up to 0.031	Apply post directed using hooded sprayers for control of emerged weeds. If crop is contacted, burning of contacted area will occur. Most effective on weeds less than 4 in. tall or rosettes less than 3 in. across. Use a crop oil concentrate at up to 1 gal per 100 gal solution or a nonionic surfactant at 2 pt per 100 gal of spray solution. Coverage is essential for good weed control. Does not control grass weeds. Can be tank mixed with other registered herbicides. Preharvest interval is 0 days.
	Contact kill of green foliage	paraquat, MOA 22 (Firestorm) 3 SL (Gramoxone Inteon) 2 SL	1.3 pt 2 pt	0.5	Apply as a banded treatment using shields to the middles between plastic to kill emerged weeds. To avoid injury, do not allow spray to contact strawberry plants. Add a nonionic surfactant at a rate of 16 to 32 oz per 100 gal or 1 gal approved crop oil concentrate per 100 gal spray solution. Do not apply within 21 days of harvest.
	Most emerged weeds	glyphosate, MOA 9 (Roundup WeatherMax) 5.5L	11 to 22 oz	0.5 to 0.94	Apply as a hooded spray in row middles or shielded spray in row middles or wiper applications in row middles or post harvest. To prevent severe injury to crop, do not let herbicide contact foliage, green shoots or stems, exposed roots, or fruit of crop. Do not apply within 14 days of harvest.
	Annual and perennial grasses only	sethoxydim, MOA 1 (Poast) 1.5 EC	1 to 2.5 pt	0.2 to 0.5	Apply as a postemergence application to kill emerged grasses. Most effective on actively growing grasses. See label for specific rates and best times to treat. Add 1 qt per acre of crop oil concentrate to spray solution. Very effective control of ryegrass but will not control sedges. Also, effective on volunteer small grains (wheat, etc.). Do not apply within 7 days of harvest.
		clethodim, MOA 1 (Arrow, Select) 2 EC (Select Max) 1 EC	6 to 8 oz 9 to 16 oz	0.094 to 0.125 0.07 to 0.125	Apply as a postemergence application to kill emerged grasses. With Select, add 1 gal crop oil concentrate per 100 gal spray mix. With Select Max, add 0.25% nonionicsurfactant, 1 qt per 100 gal spray mix. Very effective in controlling annual bluegrass. Apply to actively growing grasses not under drought stress. Do not apply within 4 days of harvest.
Broadleaf weeds including clover, dock, sowthistle, thistle, and vetch	clopyralid, MOA 4 (Stinger) 3 EC	0.33 to 0.5 pt	0.125 to 0.187	<b>Crop row.</b> Apply postemergence over crop for postemergence control. Do not use with other pesticides or surfactants. Do not apply within 30 days of harvest. <b>Row middles between plastic mulch rows.</b> Apply postemergence to row middles for postemergence control. Do not apply within 30 days of harvest.	
		0.33 to 0.67 pt	0.125 to 0.25		

\* Mode of action (MOA) code developed by the Weed Science Society of America. See section with Table 8-11, Herbicide Resistance Management, for details.