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Weed Management in Small Fruit Crops

Becky Carroll
Senior Agriculturalist

Weeds compete with crop plants for water, light, space and plant nutrients. Land preparation, cover crops, mulches and other management practices can be used to control many of these weeds. Herbicides are available that can be used effectively in a weed control program; however, no single herbicide controls all weeds. Herbicides should not be depended upon as the only resource for weed control, but should be part of an integrated pest management program.

Land Preparation

With all small fruit crops, soil should be deep and well drained. Land preparation should begin, and soil samples should be taken, the year before crop establishment. All perennial weeds such as Johnsongrass, bermudagrass and wild blackberries should be killed one year before crop planting. Systemic herbicides such as glyphosate are effective in control of these weeds, but application needs to be made while the plants are actively growing. Two or more herbicide applications may be required for total control, especially on wild blackberries. After the weeds have been killed, any needed lime and fertilizer applications can be tilled into the soil. These operations should be completed no later than the fall season before the crops are to be planted.

Cover Crops

After soil operations have been completed, the soil should be planted with a cover crop. The soil should never be bare during the winter, and a partial cover crop can be maintained throughout the year with the woody small fruit crops (blueberries, brambles and grapes). Cover crops will reduce rainfall runoff, control erosion, reduce soil temperatures, add organic matter to the soil and improve soil tilth and root penetration. Cover crops will also provide some control of annual and perennial weeds. A low-growing, mowable cover such as ryegrass or fescue can be maintained between the rows of woody plants throughout the year. This will provide a clean, firm surface for field operations and for customers in pick-your-own operations.

Some commonly used cover crops are fescue, annual ryegrass, rye, wheat and oats. Fescue is a perennial and does not need to be established annually. It has a bunch-type growth habit preventing it from creeping into unwanted areas. The cereal grains will provide a quick soil cover, and substantial amounts of organic matter, but will need to be replanted each year. Legumes such as clover and vetch will add nitrogen to the soil, but are more difficult to establish and provide little growth during cold weather. All the species mentioned here are best seeded in the early fall so they can become established before freezing weather begins. If they are planted in September or early October, complete soil cover should be obtained before winter. If they are planted in late October or early November, some growth will occur before winter, but much of the soil will remain unprotected throughout the winter. In either case, substantial growth should occur during March and April of the following year. Depending on the crop and the cultural management system used, the cover crop can be killed with a herbicide, mowed or allowed to grow until maturity.

Another possible cover crop is naturally occurring annual vegetation on the site. Native plants may be left between rows of woody small fruit crops, but should not be allowed to grow into the rows. These natural cover plants should be kept mowed to about four inches in height throughout their growing season.

Tillage between the rows is often desirable during strawberry renovation. This eliminates weeds between the rows, including extra strawberry runners. Tillage is normally not effective on perennial grasses, as regrowth from their root segments can occur following tillage. Tillage can be used to control annual weeds, but cultivation should be very shallow to reduce the possibility of damaging crop roots.

Tillage of other small fruit crops is not recommended. Some crops, such as blueberries and grapes, are shallow rooted, and any tillage near the plant may damage the roots. With blackberries or raspberries, tillage that cuts the berry roots may initiate new shoot development from the severed root segments. This may result in abundant, unwanted cane development, which can be difficult to manage. Often, mulches may be the best solution for weed control within woody crop rows, while cover crops or native plants are used between rows.

Mulches

Mulches used for weed control include straw, sawdust, wood or bark chips, plastic sheeting, woven plastic and other materials. The mulch is placed around the crop plants thickly enough to shade out emerging weeds. Many mulches also provide a physical barrier to weed emergence. Mulches are undesirable for matted-row strawberry production because they prevent the rooting of daughter plants.

Straw is inexpensive, but only moderately effective for weed control. It provides little physical resistance to weeds, and may blow away. Weed seeds may even be brought in with the straw. Straw mulch usually only lasts a few months before it must be replenished.

Sawdust is relatively inexpensive and, when applied thickly enough (four to six inches deep), provides good weed control. Wood chips and bark mulches are usually more expensive, but work just as well as sawdust. All these materials have a disadvantage because they tie up nitrogen in which they come into contact. However, the nitrogen is released after woody material decays. Woody mulches usually need to be replenished yearly, depending on how rapidly they decay under local conditions and how much fertilizer is applied to them. If the fertilizer is applied through a drip irrigation system, less of the nitrogen comes into contact with the mulch, causing less mulch decay and allowing more fertilizer to reach the crop plant immediately.

Plastic mulches may be either solid sheets or woven material. Solid sheet plastic comes in several colors, but black and white are the most common. Black plastic is usually used in small fruit production because it is readily available and less expensive than other colors. It also can help warm root systems during the spring, and may cause earlier budding of the crop. However, sheet plastics are not very durable and will usually last only one growing season or less, unless they are covered by another mulch (straw or a wood product) to prevent sun and wind from damaging them. If they are used with another mulch, they provide excellent weed control in most situations, although some perennial weeds may penetrate these mulches. Sheet plastic covered with a wood mulch may still need to be replaced in a year or two. Considerably less woody mulch is needed for this system than if only woody mulch is used. Sheet plastics are difficult to install in existing plantings.

Woven plastic mulches have high initial costs, but may last up to ten years if they are protected from the sun by a woody mulch or straw. They provide excellent barriers to weed penetration, but should not be used in brambles because they must renew their canes from the roots each year. This process could be inhibited by the woven mulch. The long-term cost of these mulches may be very attractive if they are used in blueberries or grapes.

Other Management Practices

Other management practices, including fertilization, irrigation and sanitation affect weed growth. Weeds will be less of a problem if fertilizers are applied in mulched rows or through a drip irrigation system rather than broadcast throughout the field. Drip irrigation systems, which deliver water only to crop rows provide less opportunity for weed growth between rows. Sanitation of field equipment, such as hosing off equipment and tires when moving from a weedy field to another field, can help prevent the spread of weed seeds.

Herbicides

Some weed problems may not be adequately controlled by the methods discussed above, or conditions may be such that these methods are undesirable. In these situations, herbicide use is a viable alternative.

The number of herbicides registered for weed control on small fruits is limited. If the registered herbicides available are used correctly, they can be very beneficial. Each herbicide is used differently and for a specific purpose; therefore, it is very important to know what the herbicide will do, when to use it and how to properly apply it.

The suggestions contained herein are based on the assumptions that the crop plants are healthy and proper procedures for soil preparation have been followed. Plants weakened by improper management may be susceptible to herbicide injury that would not have occurred on healthy, vigorous plants.

Federal and state laws and regulations pertaining to the use and application of herbicides are frequently revised. Always check on the status of label clearances for herbicides before use. Labels on the container give information on application restrictions, common rates, timing, directions for use and other facts that will allow for the most efficient use of these herbicides. Remember the label is the law. Always apply herbicides as the label instructs. This protects consumers, growers, the environment and the health of the planting.

Principles in Using Herbicides

The following basic principles are important in using herbicides for weed control:

1. Identify the weed before choosing the herbicide. The susceptibility of weeds to different herbicides varies with the weed species. For help with weed identification, contact your local county Extension educator.
2. Read the label for registration approval, precautions, limitations and directions for use. The rate varies with crop, target weed, soil type, etc. Only use a herbicide that has been registered for use on the specific crop to be grown. Call your county Extension educator or chemical supplier for help in determining proper rates of application.
3. If the herbicide is new, try it on a small area the first time. Even though research has shown the herbicide to be effective, field use by growers on small areas is suggested before the herbicide is used on a large acreage. This gives the grower a chance to learn how to properly use the herbicide and to determine if there are any adverse effects from use of the chemical.
4. Time of application is very important in herbicide usage. Check the label to determine when the herbicide should be used in relation to crop growth, fruiting and weed growth.
5. Calibrating the sprayer annually is necessary to apply the herbicide accurately and at a uniform rate. Care should be used to apply the herbicide so drift is minimized.

Preemergence Herbicides

Preemergence herbicides are applied to the soil surface and must be activated by rainfall. They must be applied to a weed-free soil before the weed seeds germinate or be applied with a postemergence herbicide that kills existing weeds. When the preemergence herbicides are activated by rainfall, they are taken up from the soil and kill weed seeds as they germinate.

Preemergence herbicide rates are based on soil type. Clay soils or soils high in organic matter require more herbicide to control weeds than sandy soils. Labels usually specify the appropriate rate for each soil type. Do not exceed the rate specified on the label or plants may be injured. Some herbi-

cides cannot be used on sandy soils, so be sure to consult the label before applying these chemicals.

No one preemergence herbicide will control all weed species, as each herbicide differs in the species it will control. Complete reliance on only one material year after year will result in a buildup of the weeds resistant to that material. It is important to rotate herbicides from application to application to avoid this weed buildup, and to prevent herbicide accumulation in the soil. Rotate herbicides with different mode of action numbers to help prevent developing resistances.

Two preemergence herbicides are often applied as a tank mix to broaden the range of weed species controlled. In general, any herbicide may be legally used in a tank mix, as long as the timing, rates, soil conditions, etc., do not violate the label instructions for each of the materials in the tank mix. However, the user assumes all risks associated with tank mixes not specifically mentioned on the labels for the materials in the mix.

Postemergence Herbicides

Postemergence herbicides are effective after the weeds have germinated and started to grow. The chemical must contact the leaf of the target plant.

There are two basic types of postemergent herbicides – systemic and contact. Systemic herbicides like glyphosate (RoundUp) are applied to weed foliage and are translocated throughout the plant. It is necessary for the weeds to be growing at the time of application for effective control. Addition of ammonium sulfate to the spray solution improves effect on perennial grasses. If the herbicide inadvertently gets to the cambium layer of the crop plant, it will translocate and injure it. Some systemic herbicides only affect broadleaf weeds and others only grasses. 2,4-D formulations are available for post-emergence control of broadleaf weeds. Extreme care should be exercised to avoid damage to the small fruit plants. Follow label directions carefully.

Poast® and Fusilade® are translocated postemergence grass herbicides. Like glyphosate, they will kill roots as well as top growth. In many respects they can be considered 'reverse 2,4-D' since they will kill grasses but leave broadleaved plants unharmed.

Contact herbicides such as paraquat work best when applied at relatively high temperatures and in large gallonage per acre so that good coverage of the weeds is obtained. A non-ionic surfactant should be added to get maximum results. It is important not to allow the spray to contact green stems, fruit or foliage of the fruit plants. Paraquat kills by contact and should be used on small weeds for best results. It kills the top growth, but does not affect the roots, so repeat applications on perennial weeds are required for season-long control.

Tank Mixes

The preemergence herbicides in a tank mix may be used each at full rate, but many growers get good control by using 1/2 to 3/4 of the recommended rate of each. While this can reduce costs, the user assumes all risks for reduction in weed control from reducing application rates. Combining preemergent herbicides targeting grasses with another preemergent broadleaf herbicide is a popular tank mix.

Additional References

HLA-6005 Mulching garden soils
CR-6252 Commercial grape insect & disease control
CR-6221 Commercial blackberry, strawberry & blueberry insect & disease control
HLA-6222 Home Fruit Planting Guide
EPP-7450 Safe use of pesticides in the home and garden

Weeds	*Time of Application*	*Herbicide*	*MOA*	*Crop*	*Comments*
Annual grass & broadleaf weeds	preemergence	Alion (indaziflam)	29	Grapes	Age Restriction: Grapes must be established a minimum of 5 years and growing vigorously. Only apply to grapes that have at least 12 inches between soil line and majority of root system. Avoid direct or indirect spray contact with crop foliage, green bark, roots, or fruit. Allow at least 30 days between applications. Do not apply within 25 feet of ponds, rivers, streams, or wetlands. Spot spraying is not recommended. PHI= 14 days.
		Callisto (mesotrione) Other names: Explorer	27	Blueberries	Apply pre-or early post-emergence. For improved post-emergence control, apply 3.0 fl oz followed 3 weeks later by a second application at same rate. Apply prior to bloom. Include a crop oil concentrate if applied post-emergence to weeks.
		Casoron CS (dichlobenil)	20	Brambles Blueberries	Age Restriction: Do not apply to new plantings less than one year old.Apply in early spring before weeds germinate or after cultivation and incorporate thoroughly. Do not apply during crop shoot emergence.
				Grapes	Age Restriction: Use only on well-established vines, 1 year after transplanting. Apply late fall through early spring. Use prior to weed emergence or not later than when < 2 inches tall.
		Devrinol 50DF (napropamide)	15	Strawberries	Do not apply from bloom to harvest. Soil must be wetted to a depth of 2 to 4 inches after application. Refer to label for application instructions that differ with planting type.
				Brambles Blueberries	Apply in the fall or early spring prior to weed emergence. Moisture needed for activation. For new and established plantings.
				Grapes	Apply in the fall or early spring prior to weed emergence. Incorporate into soil by shallow cultivation or irrigation within 24 hours of application. Rainfall or irrigation is necessary for activation. May be applied to new planted vines. Do not apply within 35 days of harvest.
		Karmex 80DF (diuron) Other names: Diuron, Parrot, Cleanshot, Determine	7	Grapes	Age Restriction: Apply only in vineyards established 3 or more years as band treatment to grape rows. Apply in spring prior to weed seed germination. Proper rates depend on soil texture.
		Matrix FVN or SG (rimsulfuron) Other names: Solida	2	Grapes	Age Restriction: Do not apply to vines established less than one year. Apply as banded application to base of vines. Soil should be moist at time of application and rainfall or irrigation follows. Pre-harvest interval is 14 days.
		Princep 4L (simazine) Other names: Simazine, Sim-trol	5	Brambles Blueberries	Apply in the early spring before bud break, or as a split application in the fall and spring. Do not apply during fruiting. Use ½ rate on plantings established less than 6 months.
				Grapes	Age Restriction: Plants must be established at least 3 years. Apply between harvest and early spring before weeds emerge. Proper rate depends on soil texture.

Weeds	*Time of Application*	*Herbicide*	*MOA*	*Crop*	*Comments*
		Sinbar WDG (terbacil)	5	Strawberries	Do not apply within 110 days of harvest. Rate depends on soil texture. Runner production and plant stand may be reduced. Varieties vary in sensitivity.
				Brambles	Age Restriction: Treat bushes established one year or more. Rate depends on soil texture. Do not apply within 70 days of harvest. Crop injury may result from use on low organic matter soils
				Blueberries	Age Restriction: Treat bushes established one year or more. Rate depends on soil texture. Crop injury may result from use on low organic matter soils. Avoid contact of foliage and fruit. Apply in spring or after harvest before weeds emerge or early seedling stage.
		Solicam DF (norflurazon)	12	Brambles	Age Restriction: Do not use on plants less than 18 months old. Apply fall to early spring while crop is dormant and before weed emergence begins. Raspberries are sensitive. Rate depends on soil texture. PHI=60 days. Temporary loss of pigment in leaf veins may occur with normal use.
				Blueberries	Age Restriction: Do not use within 6 months of establishment. Apply from fall to early spring before weeds emerge. Rate depends on soil texture. PHI=60 days.
				Grapes	Age Restriction: Not within 2 years of establishment. Apply fall to early spring before weed emergence. Use lower rates on coarse soils. Rate depends on soil type. Do not use on sandy or gravelly soils. Do not use within 60 days of harvest.
		Surflan AS (oryzalin) Other names: Fugitive, Oryzalin	3	Brambles	Irrigation or rainfall of ½ to 1 inch is needed to move the herbicide into the weed germination zone. Minimum 2.5 months between applications.
				Blueberries Grapes	Surface apply after existing weeds are killed by tillage or contact herbicide. One-half inch to 1 inch of rain or irrigation is required to move the herbicide into the weed germination zone. Duration of weed control is dependent on rate of application.
		Treflan HFP 4EC (trifluralin) Other names: Trifluralin, Trust	3	Grapes	Apply and incorporate prior to planting, or any time within 60 days before harvest. Rate depends on soil texture and amount of rainfall.
	At transplanting or PPI and Fall and Early Spring for established	Dacthal 6F (DCPA)	3	Strawberries	Do not apply after 1st bloom through harvest
Annual broadleaf weeds & suppression of grass	Preemergence	Chateau WDG (flumioxazin) Other names: Tuscany	14	Strawberries	Preplant -Apply at least 30 days before transplanting. Do not apply to frozen ground. Can apply while plants are dormant on established or newly planted with shielded sprayer to row middles. Do not apply after fruit set and not over strawberries.
				Grapes	Age Restriction: Must be established 2 years unless trellised at least 3 ft from soil surface or are protected by non porous wrap, grow tubes, or waxed containers. Apply after harvest until bud break. Apply alone or tank mix with Roundup or Gramoxone. Do not incorporate. Do not allow drift to contact foliage or green bark. Always add crop oil or surfactant. PHI=60 days.

Weeds	*Time of Application*	*Herbicide*	*MOA*	*Crop*	*Comments*
Annual grass & broadleaf weeds & yellow nutsedge	Preemergence	Velpar 2L (hexazinone) Other names: Tide Hexor 2SL, Velossa	5	Blueberries	Age Restriction: Use on plantings established at least 3 years. Apply to pruned blueberries in the spring before leaf emergence as a directed soil application. Some clones are susceptible to injury. PHI = 90 days.
Annual grass & certain broadleaf weeds	preemergence	Prowl H20 3.8E (penimethalin) Other names: Satellite, Hydrocap	3	Strawberries	Apply as broadcast spray before transplanting . PHI=35 days. Rainfall or irrigation after application will have best results. 3 pt/app and 6 pt/season. Soil type determines application rates.
				Grapes	On newly planted to 1 yr old, apply to dormant grapevines. In bearing vineyards, may be applied any time after fall harvest, during winter dormancy and in spring. In non-bearing vineyards, may be applied preplant incorporated, preplant surface or preemergence. Needs rain or irrigation within 21 days. Do not allow spray to contact leaves, shoots, or buds. For new plantings, do not apply until soil has settled and no cracks are present. PHI = 90 days
		Snapshot 2.5TG (isoxaben+trifluralin)	3,21	Brambles Blueberries Grapes	Non-bearing only: May only be used on crops that will not be harvested within 1 year of application. Not effective on germinated weeds.
Annual broadleaf weeds	Preemergence	Gallery 75DF (isoxaben)	21	Brambles Blueberries Grapes	Non-bearing only: May only be used on crops that will not be harvested within 1 year of application. Apply later summer to early spring Do not apply to new plantings before soil near the plants has settled. Rate depends on weed species.
		Goal 2XL (oxyfluorfen) Other names: Goaltender, Galigan, Collide	14	Strawberries	Fallow bed preparation only: Apply alone or with Roundup a minimum of 30 days before transplanting. Fallow bed should be worked thoroughly to a depth of 2.5 in prior to planting.
				Grapes	Age Restriction: Do not apply to vines established for less than 3 years unless vines are on a trellis at least 3 ft above the soil surface. Apply in early spring when grapevines are dormant, before buds start to swell. Vines must be staked or trellised prior to application. Rate varies with application timing - see label.
Winter annual & perennial grass & broadleaf weeds	Preemergence Postemergence	Kerb® SC (pronamide)	3	Blueberries	Dormant Application Only: Apply in late fall or early winter under cool temperatures above freezing. Do not apply until blueberry roots are well established. Follow with irrigation. Restricted Use Pesticide.
				Grapes	Age Restriction: Do not apply to vines less than 1 year old or within 6 months of spring transplanting or within 1 year of fall transplanting. Apply in late fall after the fruit is harvested but prior to leaf drop and soil freeze up. Restricted Use Pesticide.
Annual grasses & broadleaves	Postemergence directed spray	Ultra Blazer 2E (acifluorfen) Other names: Acifin 2L, Acifluorfen 2L, Avalanche Ultra, Levity, Uproar		Strawberries	Max of 1.5 pt/acre , 3 pt per acre per season. Annual strawberries PHI=60 days; Matted row PHI=120 days (perennial) Nonionic surfactant or crop oil

Weeds	*Time of Application*	*Herbicide*	*MOA*	*Crop*	*Comments*
Annual grass and broadleaf weeds, suppression of perennials	Postemergence	Gramoxone® Inteon 2L (paraquat) Other names: Bonedry, Cyclone SL, Firestorm, Helmquat 3SL, Parazone 3SL	22	Strawberries	Apply between plant rows using shields to prevent spray contact with strawberry plants. Apply when weeds are actively growing and are between 1 and 6 inches tall. Do not apply more than 3 times per year or within 21 days of harvest. Always use nonionic surfactant or crop oil concentrate. Restricted Use Pesticide.
				Brambles Blueberries	Apply before emergence of new canes or shoots to avoid injury. Apply as coarse directed spray to thoroughly wet weeds and avoid drift injury. Max 5 app/yr. Always use a nonionic surfactant or crop oil concentrate. Restricted Use Pesticide
				Grapes	Apply as a coarse directed spray to thoroughly wet weeds and avoid drift injury. Treat when sucker growth is no more than 8 inches long. Avoid contact with desirable foliage. Max of 5 app/yr. Always use a nonionic surfactant or crop oil concentrate. Restricted Use Pesticide.
Annual grass and broadleaf weeds, suppression of perennials	Postemergence directed spray	Rely 280 (glufosinate) Other names: Cheetah, Forfeit 80, Lifeline, Reckon 280L, Summit Agro Refer 280SL	10	Blueberries	Do not allow spray to contact desirable foliage. Do not exceed 3 lb ai/year. PHI=14 days.
				Grapes	Do not apply within 14 days of harvest. Directed spray. Can be used for sucker control on mature vines - see label.
		Scythe 4.2E (pelargonic acid)	27	Strawberries Brambles Blueberries Grapes	Non selective, contact activity. Controls emerged green vegetation. Avoid contact with leaves or canes.
Annuals & perennial weeds	Postemergence	Roundup WeatherMax 5.5EC (glyphosate)	9	Strawberries	Apply as pre-plant broadcast application or in fall for control of roots and rhizomes of perennial weeds or as a directed spray or wiper application to actively growing weeds in established plantings. PH1 = 14 days.
	Postemergence directed spray	Other names: Showdown, Envy, Glypo 41, Duramax, Durango, Rapid Fire, and more		Brambles Blueberries	Do not use within 14 days of harvest. Apply as a directed spray or spot treat before budbreak. Avoid contact with canes and foliage.
				Grapes	Apply as directed spray in established vineyards or for site preparation prior to transplanting. Do not treat within 14 days of harvest or when green vegetation, canes, or shoots are in spray zone. Rate varies depending on weed species and height. Do not allow spray or drift to contact immature wood or foliage.
Annual & perennial grass	Postemergence	Fusilade DX 2EC (fluazifop-p)	1	Strawberries Brambles Blueberries	Non-bearing only: May only be used on crops that will not be harvested within 1 year of application. Apply as a directed spray to actively growing grasses before tillering. Always add crop oil or nonionic surfactant. Avoid contact with foliage.
				Grapes	Apply as directed spray with appropriate crop oil, surfactant, or adjuvant. Growth stage and rates of application vary with location in state. Consult label. PHI is 50 days after application

Weeds	*Time of Application*	*Herbicide*	*MOA*	*Crop*	*Comments*
		Poast 1.5 EC (sethoxydim)	1	Strawberries	Apply to actively growing grasses. Do not apply within 7 days of strawberry harvest. Maximum 2.5 pt app and 2.5 pt per season. Always use a crop oil concentrate.
				Brambles	Do not apply within 45 days of harvest. Rate depends on grass species and height. Always use a crop oil concentrate.
				Blueberries	Do not apply within 30 days of harvest. Apply as a directed spray. Two applications usually necessary to control perennial grasses. Always use crop oil concentrate.
				Grapes	Do not apply to crops to be harvested within 50 days of application. Apply to annual grasses up to 12 inches in height. Rate depends on grass species and height. Always use a crop oil concentrate.
		Select 2EC (clethodim) Other names: Arrow 2EC, Avatar, Cleanse 2EC, Clethodim 2EC, Dakota, Section 2EC, Shadow, Volunteer	1	Strawberries	Apply as a directed spray to actively growing grasses before tillering. Always add crop oil. Rainfast in 1 hour. 14 days between applications PHI=4 days
				Brambles Blueberries Grapes	Non-bearing only. May only be used on crops that will not be harvested within 1 year. Do not spray directly on crop plants. Direct spray at the base of the plant near ground. Always use a non-ionic surfactant.
Broadleaf weeds	Postemergence	Aim 2EC or 2 EW (carfentrazone)	14	Strawberries	Apply with hooded shields between rows during growing season to actively growing weeds. Always add nonionic surfactant or crop oil. Max 6.1 fl oz per year. Minimum 14 days between applications. PHI = 0 days.
				Brambles	Apply with hooded shields between rows during growing season to actively growing weeds. Do not allow contact with green stem, fruit, bloom or foliage. Always add nonionic surfactant or crop oil. Minimum 14 days between applications. PHI = 15 days.
				Blueberries	Apply broadcast at base of trunks during dormant stage or with hooded shields between rows during growing season. Do not allow contact with green stem, fruit, bloom or foliage. Always add nonionic surfactant or crop oil. PHI = 0 day.
				Grapes	Age Restriction: Do not apply to newly transplanted vines. Apply broadcast at base of trunks during dormant stage or with hooded shields between rows during growing season. Always add nonionic surfactant or crop oil. Tank mix with Roundup or Gramoxone for broader weed control. PHI = 3 days.
		Reglone 2L (diquat) Other names: Aceto Diquat 2L, Nufarm Diquat 2L, Rowrunner AG, Vendure-X	22	Brambles Blueberries Grapes	Non-bearing only. May only be used on crops that will not be harvested within 1 year. Apply as a directed spray using a shield for contact burn of weeds. Always use a nonionic surfactant. Can be used during site preparation. Do not allow contact with green stems, foliage or fruits.

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