

Managing Weeds in Grapes in New Mexico

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INTRODUCTION

Weeds compete with grapevines for resources such as water, nutrients, and light. However, the intensity of this competition varies during the lifecycle of the grapevines, and is more impactful during the early stages of vineyard establishment. This significant competition from weeds in the early stages of vineyard life is due to limited root development and vegetative growth of the vines. Weeds' competition with vines for water and nutrients is most



Figure 1. Field bindweed (*Convolvulus arvensis*) growing in vine rows and over a young grapevine.

severe when vines' root systems are shallow and not well developed. At the same time, newly planted vines, due to their smaller size and transplant shock, can quickly be overgrown by tall, fast-growing weeds such as Palmer amaranth (*Amaranthus palmeri*), kochia (*Kochia scoparia*), Johnsongrass (*Sorghum halepense*), and many others, which impedes the development of young vines. Some weed species can also directly reduce the vines' growth and development by releasing growth-inhibiting allelopathic chemicals. Additionally, weeds with vine-like growth, such as field bindweed (*Convolvulus arvensis*) and morningglory (*Ipomoea* spp.), can cause physical damage to grape plants as they climb, wrap around, and ultimately strangle the grape leaves and fruit (Figure 1). Weeds can also indirectly affect the grapevine by serving as an alternative host for insects and diseases. Furthermore, weeds that grow around the grapevine





Figure 2. Mature vineyard with residential ground cover vegetation. Note: Weeds along the vine rows are controlled by application of a post-emergence herbicide.

trunk can provide a habitat for rodents that can damage the trunks and/or the roots, thus further reducing the healthy growth and production of vines. Most vineyards also depend on revenue from tours, wine tastings, and events that are dependent on pleasing aesthetics, which is diminished by the presence of weeds. As a result, successful weed management in vineyards will significantly improve grapevine establishment and grape production, while likely enhancing marketing efforts.

Because weed management techniques are often species-specific, the first step to successful weed management is to correctly identify weeds, and to keep an up-to-date record of weeds that are present in the vineyard from season to season. Weeds can be identified using resources such as weed identification books, websites, Cooperative Extension Service publications, Extension personnel, and crop consultants. While it is important to know the name of a weed, it is crucial to understand as much about the lifecycle and reproductive mode and capacity of that specific plant, in order to make sound and effective management decisions. Keep in mind that common names of plants can vary, or the same name may refer to different species across regions and communities. Cross-referencing weeds by their scientific names, which are universally the same for that plant, can help confirm the correct identity of

the weeds. Accurate information on the biology and lifecycle of the weeds can help growers apply weed management techniques more effectively, based on the timing of susceptibility of the species. It is important to know that weeds are often more susceptible to certain management techniques during specific stages of their development, such as when they are young and/or actively growing. All weeds, including grasses, sedges, and broadleaves, are categorized based on their lifecycle (a process including germination, vegetative growth, flowering, seed set, and death) into annuals, biennials, and perennials. Some of the common weeds found in New Mexico agricultural fields and their lifecycles are listed in Table 1.

INTEGRATED WEED MANAGEMENT

A weed management program is simply a planned schedule of activities based on the biology of the target weeds, the age of the vineyard, and other economic and environmental considerations. Weed management is a process that should start before new vines are planted and continue throughout the life and production of a vineyard. The best weed management practices in vineyards are achieved by combining preventive, cultural, mechanical, and chemical methods, which are the foundation for an integrated weed management program. Using a single weed management method continuously—whether it is cultural, mechanical, or chemical—could cause a shift in the weed populations toward weed species that can resist that method, rendering it ineffective over time. Therefore, integrating varied control methods into the management program is necessary for the sustainability of weed management and grapevine performance. The goal in integrated weed management is not only to control the existing weed infestations but also to prevent any future infestations. Integrated weed management strategies could vary depending on the age of the vines, soil conditions, weed spectrum, climatic conditions, irrigation practices, and a grower's management preferences. Designing effective in-

Table 1. Some of the Common Weeds Associated with Agricultural Fields in New Mexico

Common Name	Scientific Name	Class
Annuals (Plants that complete their lifecycle within one year and reproduce through seed production only.)		
Summer Annuals		
Barnyardgrass	<i>Echinochloa crusgalli</i>	Grass
Junglerice	<i>Echinochloa colona</i>	Grass
Marestail	<i>Conyza canadensis</i>	Broadleaf
Pigweed	<i>Amaranthus</i> spp.	Broadleaf
Sandbur	<i>Cenchrus</i> spp.	Grass
Sprangletop	<i>Leptochloa chinensis</i>	Grass
Foxtail	<i>Setaria</i> spp.	Grass
Kochia	<i>Kochia scoparia</i>	Broadleaf
Morningglory	<i>Ipomoea</i> spp.	Broadleaf
Russian thistle	<i>Salsola iberica</i>	Broadleaf
Southwestern cupgrass	<i>Eriochloa acuminata</i>	Grass
Lambsquarters	<i>Chenopodium album</i>	Broadleaf
Winter Annuals		
Downy brome	<i>Bromus tectorum</i>	Grass
London rocket	<i>Sisymbrium irio</i>	Broadleaf
Shepherd's purse	<i>Capsella bursa-pastoris</i>	Broadleaf
Flixweed	<i>Descurainia sophia</i>	Broadleaf
Rescuegrass	<i>Bromus catharticus</i>	Grass
Tansymustard	<i>Escurainia pinnata</i>	Broadleaf
Biennials (Plants that require two years to complete their lifecycle and reproduce through seed production only.)		
Common mallow	<i>Malva neglecta</i>	Broadleaf
Musk thistle	<i>Carduus nutans</i>	Broadleaf
Perennials (Plants that live more than two years. They reproduce through seed and vegetative reproductive structures such as root buds, rhizomes, crowns, tubers, stolons, or bulbs.)		
Simple Perennials		
Curled dock	<i>Rumex crispus</i>	Broadleaf
Dandelion	<i>Taraxacum officinale</i>	Broadleaf
Creeping Perennials		
Bermudagrass	<i>Cynodon dactylon</i>	Grass
Johnsongrass	<i>Sorghum halepense</i>	Grass
Silverleaf nightshade	<i>Solanum elaeagnifolium</i>	Broadleaf
Field bindweed	<i>Convolvulus arvensis</i>	Broadleaf
Texas blueweed	<i>Helianthus ciliaris</i>	Broadleaf
Yellow nutsedge	<i>Cyperus esculentus</i>	Sedge
Purple nutsedge	<i>Cyperus rotundus</i>	Sedge
Bermudagrass	<i>Cynodon dactylon</i>	Grass

tegrated weed management strategies requires a thorough understanding of the weed management methods, the biology of the target weed, and the various viticultural practices.

SITE PREPARATION

At sites that are infested with hard-to-control weeds (e.g., bermudagrass, field bindweed, Johnsongrass, purple and yellow nutsedge, silverleaf nightshade, and Texas blueweed), efforts must be focused on controlling these hard-to-control weeds prior to planting the vineyard.

In sites that are heavily infested with annual weeds, tillage or cultivation can be used for control. Because cultivation stimulates germination of weed seeds, growers can reduce the existing populations and stimulate seed germination, controlling the young weed seedlings soon after emergence with more cultivation or herbicides. Depending on the level of infestation, this strategy could be repeated several times to reduce the weed seed bank as much as possible prior to planting the vineyard.

CULTURAL CONTROL

Using ground cover vegetation or mulches can reduce the weed density in vineyards. Although weed densities can be reduced by maintaining ground cover vegetation between vine rows, the cover vegetation—if not managed



Figure 3. Mature vineyard with no ground cover vegetation. Note: Weeds under the vine rows and between the vine rows are controlled by mechanical means.

properly—can also compete with the grapevines, especially during vineyard establishment. Based on observations in New Mexico, a weed-free strip of 24 inches wide along the vine row (12 inches on either side of the plant) may be sufficient to keep competition between the young vine and ground cover vegetation under control. Under optimal conditions, it usually takes three years for a vineyard to be considered an established vineyard. Recommended ground cover vegetation that could tolerate mowing, flooding, and traffic falls into two categories: grasses (either resident or established) and perennial nitrogen-fixing legumes (examples include clover and vetch species). In areas where southern root-knot nematodes (*Meloidogyne incognita*) are a concern, care must be taken to select ground cover vegetation that is not a host for this pest. Maintaining ground cover vegetation in vineyards can also minimize soil erosion, increase soil organic matter and beneficial microbial populations, decrease water/irrigation loss through evaporation, and improve equipment and personnel access during wet conditions (Figure 2).

Organic or synthetic mulches can also be effective for weed management in vineyards. Mulches can prevent weed seed germination by preventing sunlight from reaching the soil surface. Therefore, the effectiveness of mulches is directly dependent on the

timing of mulch application and the thickness of the mulch layer. If the mulch is applied after the weed seeds are germinated, the weed control effect will be minimal. If the mulch layer on the vineyard floor is not thick enough (which could vary depending on the type of mulch), sunlight will penetrate the layer and weed seeds will continue to germinate. It is important to understand that mulches, even when applied and maintained correctly, will not prevent the regrowth of perennial weeds in the vineyards, and ad-

ditional weed control methods (e.g., herbicides) must therefore be implemented to control perennial weeds. Mulches also enhance the moisture conditions of the vineyard floors, which is especially important in improving the growth of newly planted vines.

MECHANICAL CONTROL

Mechanical weed control is best described as a non-selective control option that is particularly effective against annual weeds (Figure 3). Mechanical control is physical weed removal by tools such as hoes, disks, cultivators, mowers, hands, etc. These devices are designed to damage, uproot, or cut weed seedlings. The effectiveness of mechanical tools varies depending on the weed size and weed growth type. Cultivation and hoeing are best accomplished when weeds are in the seedling stage (<3 inches) since it becomes more difficult to cultivate or hoe as weeds get bigger.

Excessive cultivation can lead to undesirable consequences such as soil erosion, reduced soil organic matter, and breakdown in soil structure that results in compaction and reduced rain/irrigation permeability. Also, if not done carefully, cultivation could injure vine roots. Cultivated soils can also restrict equipment access for vineyard operations; therefore, it is important to avoid excessive cultivation events, and to time this practice to limit the possible negative effects

of cultivation as much as possible. Mechanical control of weeds in between the rows can be achieved using shallow cultivators or mowers. However, mechanical weed management in the vine rows requires specialty tillage equipment (examples include weed badger, French vineyard plough, or Clemens radius) to minimize potential damage to the vines. Additionally, mowing practices will not be effective in controlling small weed seedlings or perennial weeds with prostrate growth habits since any plant structures located below the mowing height will most likely survive and recover over time.

Prescribed burning is a method that utilizes direct flames and/or intense heat to kill young weeds. It is most effective when used in the seedling stage of young annual weeds (Figure 4). However, caution must be taken to avoid flaming the vines, irrigation tubing, and other fire hazards when using this method for weed management.

CHEMICAL CONTROL

Herbicides are the most commonly used weed management tool in most cropping systems, including vineyards. Various types of herbicides are registered for use in New Mexico vineyards (Table 2). Herbicides vary greatly in their target species and sites of action, so it is important to select the appropriate herbicide for the conditions and weeds present. The following are the terms describing the times at which herbicides may be applied, and they refer to the stage of development of the weeds.

Pre-emergence herbicides are generally applied to the soil prior to weed emergence for residual weed control, and may require incorporation by either mechanical tillage or water (rainfall or irrigation). However, some herbicides, such as diuron (Karmex DF) and flumioxazin (Chateau), have both pre-emergence



Figure 4. Using a propane flame weeder to control weeds in the vine row.

and post-emergence activities that can control small seedlings of certain weed species as well as provide residual weed control.

Post-emergence herbicides, such as clethodim (Select 2EC), glufosinate-ammonium (Rely 280), glyphosate (Roundup PowerMAX), carfentrazone-ethyl (Aim EC), and paraquat dichloride (Gramoxone), are all applied after weed emergence. However, the method of application could vary depending on the herbicide (see Table 2 for more details).

Particular herbicides may be labeled for non-bearing vines only, bearing vines only, or for both bearing and non-bearing vines. Non-bearing vines are classified as plants that will not bear fruit for at least one year following application of a particular herbicide.

When using chemical control, growers must be aware that repeated use of a single herbicide active ingredient, or active ingredients within a particular herbicide group with the same site of action, could select for herbicide-resistant weeds. To avoid selecting for resistant weeds, make sure to rotate herbicides with different groups or sites of action, and do not make more than two consecutive applications of herbicides from the same group against the same weed.

Herbicides kill plants by binding to a specific protein and inhibiting that protein's function. The binding

site of an herbicide is referred to as the herbicide's site of action. Herbicide grouping is based on the site of action of herbicide; therefore, herbicides with the same site of action are assigned the same group number. Since no single herbicide controls all weeds commonly found in vineyards, tank-mixing two or more herbicides from different herbicide groups can delay or prevent the development of herbicide resistance in weeds and dramatically increase the spectrum of weed control. However, it is important to follow the label directions on tank-mixing different herbicides since some herbicides may not be compatible with each other. If such incompatible herbicides are mixed, the efficacy of one or both partners in the mixture can be reduced. When using herbicides, it is important to use proper equipment and calibrate the equipment regularly. A wide variety of equipment, ranging from a simple backpack sprayer to units with optical controllers for precise application, is available for herbicide application in vineyards.

A list of currently registered herbicides for vineyards in New Mexico, their Weed Science Society of America (WSSA) grouping, and some information regarding their usage is provided in Table 2. Be sure to read, understand, and follow the label instructions when using any pesticide. Pay particular attention to information such as required personal protective equipment (PPE), timing of application, rates of application, harvest restrictions, vineyard characteristics (e.g., soil type), restrictions, and types of weeds controlled. Many times the poor performance or non-performance of an herbicide can be traced to improper use and failure to follow label directions. Because some herbicides have long residual activities, it is important to obtain the history of herbicides used in the field before planting vines; this will help to reduce the risk of herbicide injury to vines due to carryover of previously used herbicides.

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Table 2. Herbicides for Use in New Mexico Vineyards¹

Common Name/WSSA Grouping ²	Example of Trade Name ³ /EPA Registration No.	Grapevine Status	Weeds Controlled
Carfentrazone-ethyl/ Group 14	Aim EC/279-3241	Bearing and non-bearing	Annual and perennial weeds
Contact herbicide. May be applied for post-emergence control of certain weed species listed on the label or for sucker control in grapes. Aim EC can be applied as a directed spray treatment or as a hooded spray treatment for the control of emerged and actively growing weeds. Effective control with Aim EC requires thorough coverage of the emerged plants.			
Clethodim/Group 1	Select 2EC/59639-3	Non-bearing	Annual and perennial grasses
May be applied for post-emergence control of grass weeds. Select 2EC should not be applied over the top of vines. Instead, spray should be directed at the base of the vines where grassy weeds are growing near the ground. Non-bearing vines are plants that will not bear fruit for at least one year following Select 2EC application.			
Dichlobenil/Group 20	Casoron 4G/400-168	Bearing and non-bearing	Annual and perennial weeds
May be applied for pre-emergence control of certain weed species listed on the label. Do not apply this herbicide until four weeks after transplanting. Do not allow livestock to graze treated areas. Granules must be incorporated (via irrigation) into soil after application. Do not overwater to the point of surface runoff. Do not apply in areas where soils are permeable, particularly where the water table is shallow, which may result in groundwater contamination.			
Diquat dibromide/ Group 22	Diquat 2L AG/2749-530	Non-bearing	Annual broadleaf and grass weeds
Applied as a contact-type herbicide; thus, complete coverage of target weed is essential for control. This product is typically used for site preparation prior to planting and up to one year prior to harvest. Do not allow spray to contact green stems, foliage, or fruit because injury can occur. Use shield or wrap when spraying around young vines.			
Diuron/Group 7	Karmex DF/66222-51	Bearing	Broadleaf weeds and some annual grasses
May be applied for pre-emergence and post-emergence non-selective control of certain weed species listed on the label. Karmex DF should not be applied on soils with less than 1% organic matter. Apply only as band treatment to established vineyards at least three years old.			
Fluazifop-p-butyl/ Group 1	Fusilade DX/100-1070	Bearing and non-bearing	Annual and perennial grasses
May be applied for post-emergence grass control. In established vineyards, do not harvest grapes within 50 days of last application. Maintain a minimum of 14 days between applications. Refer to main and supplemental labels for more information.			
Flumioxazin/Group 14	Chateau SW/59639-99	Bearing and non-bearing	Broadleaf and grass weeds
May be applied for pre- and post-emergence control of broadleaf and grass weeds. Avoid direct or indirect spray contact to foliage and green bark (non-barked grape vines with the exception of undesirable suckers).			

Common Name/WSSA Grouping	Example of Trade Name/ EPA Registration No.	Grapevine Status	Weeds Controlled
Indaziflam/Group 29	Alion/264-1106	Bearing and non-bearing	Annual broadleaf and grass weeds
May be applied for pre-emergence control of annual broadleaf and grass weeds. Only use Alion in established vineyards with at least three years after vines have been planted and exhibiting normal growth and good vigor. Ensure grapes have 6 inches of soil barrier between soil surface and major portion of root system to avoid injury.			
Isoxaben/Group 21	Gallery 75/62729-145	Non-bearing	Annual broadleaf weeds
May be applied for pre-emergence control of certain broadleaf weed species. Does not control established weeds or weeds growing back from taproots, rhizomes, stolons, or root pieces. Must be incorporated by moisture into soils following application in order to be effective.			
Glufosinate-ammonium/Group 10	Rely 280/264-829	Bearing and non-bearing	Broadleaf and grass weeds
May be applied for post-emergence control of certain weed species listed on the label. Rely 280 is a contact herbicide, and thorough coverage of all green plant tissue is essential for effective control. Do not apply this product within 14 days of grape harvest. Do not graze, harvest, and/or feed treated vineyard cover crops to livestock. Apply this product for weed control only when green shoots, canes, or foliage are not in the spray zone.			
Glyphosate/Group 13	Roundup Power-MAX/524-549	Bearing and non-bearing	Broadleaf and grass weeds
May be applied for non-selective post-emergence control of certain weed species listed on the label. To avoid damage, spray solutions of this product must not be allowed to contact desirable vegetation, including green shoots and foliage. Allow a minimum of 14 days between application and harvest.			
Napropamide/Group 15	Devrinol 50-DF/70506-36	Bearing and non-bearing	Annual grass and broadleaf weeds
May be applied for pre-emergence control of certain weed species listed on the label. Do not allow treatment to contact foliage or crop. Apply with sufficient water to wet the soil to a depth of 2–4 inches.			
Norflurazon/Group 12	Solicam DF/61842-41	Bearing and non-bearing	Annual grass and broadleaf weeds
May be applied for pre-emergence control of certain weed species listed on the label. Apply as directed spray to the soil. Avoid contact with fruit or foliage. The soil must be settled, firm, and relatively free of weeds and debris at the time of application. Soil should be free of depressions around vines where rain or irrigation water can pool. Do not harvest for 60 days following application. Maximum allowable annual rate will depend on soil type; refer to label for these rates.			
Oryzalin/Group 3	Surflan A.S./70506-43	Bearing and non-bearing	Annual grass and broadleaf weeds
May be applied for pre-emergence control of certain weed species listed on the label. Do not apply within 35 days of harvest. Can be applied through irrigation systems. Refer to the label for further information and instructions.			

Common Name/WSSA Grouping	Example of Trade Name/ EPA Registration No.	Grapevine Status	Weeds Controlled
Oxyfluorfen/Group 14	GoalTender/62719-447	Bearing	Annual broadleaf and some grass weeds
May be applied for pre-emergence and post-emergence control of certain weed species listed on the label. Effective post-emergence control requires thorough coverage of the emerged plants. Do not apply to grapes established less than three years unless they are trellised at least 3 ft from the soil surface. Do not apply GoalTender during the period between bud swell and completion of final harvest or when fruit are present. GoalTender may be applied after completing final harvest. This herbicide can be applied through irrigation systems. Refer to main and supplemental labels for more information.			
Paraquat dichloride/ Group 22	Gramoxone Inteon/100-1217	Bearing and non-bearing	Annual broadleaf and grass weeds
Gramoxone Inteon is a restricted-use herbicide and can only be purchased and applied by licensed individuals. May be applied for post-emergence control of certain weed species listed on the label. Do not allow spray to contact green stems (except suckers), fruit, or foliage. Use a shield or wrap plant when spraying around young vines. Do not graze or feed cover crops grown in treated areas to livestock. Treat when sucker growth is no more than 8 inches long. Late-season applications to weeds should be made to avoid contact with desirable foliage.			
Pendimethalin/Group 3	Prowl H2O/241-418	Bearing and non-bearing	Annual grass and broadleaf weeds
May be applied for pre-emergence control of certain weed species listed on the label. For newly transplanted and one-year-old grapevines, apply only to dormant vines. Do not apply over the top of grapevines with leaves, buds, or fruit. Do not apply within 90 days of fruit harvest. Do not feed forage or graze livestock in treated vineyards.			
Pronamide/Group 3	Kerb 50-W/62719-397	Bearing and non-bearing	Grass and broadleaf weeds
Kerb 50-W is a restricted-use herbicide and can only be purchased and applied by licensed individuals. May be used for pre-emergence and early post-emergence control of certain weed species in vineyards. Kerb 50-W must be applied in the fall after the fruit is harvested but prior to soil freeze-up. Kerb 50-W may not be applied to seedling vines less than one year old, fall-transplanted stock transplanted less than one year, or spring-transplanted stock transplanted less than six months.			
Pyraflufen-ethyl/ Group 14	Venue/71711-25	Bearing and non-bearing	Broadleaf weeds
A contact herbicide. May be applied for post-emergence control of broadleaf weeds or for sucker control in grapes. Thorough coverage is necessary for effective control. Avoid contact with green, un-callused bark of young vines established less than one year unless protected from spray contact by nonporous wraps, grow tubes, or waxed containers. Refer to main and supplemental labels for more information.			
Rimsulfuron/Group 2	Matrix/352-556	Bearing and non-bearing	Grasses and broadleaf weeds
May be applied for pre-emergence or post-emergence control of broadleaf weeds and grasses. Do not apply within 14 days of harvest. There may be specific application instructions for specific target weeds. Refer to information and instructions within the label for these types of weeds.			

Common Name/WSSA Grouping	Example of Trade Name/ EPA Registration No.	Grapevine Status	Weeds Controlled
Sethoxydim/Group 1	Poast/7969-58	Bearing and non-bearing	Grasses
May be applied for post-emergence grass weeds control. Does not control sedges or broadleaf weeds. Do not apply through any type of irrigation system. Do not apply within 50 days of harvest. Do not feed forage or graze livestock in treated vineyards.			
Simazine/Group 5	Princep 4L/100-526	Bearing	Grasses and broadleaf weeds
May be applied for pre-emergence control of certain weed species listed on the label. Princep 4L must be applied between harvest and early spring. Do not apply in vineyards established less than three years.			
Trifluralin/Group 3	Treflan 4EC/5905-532	Bearing and non-bearing	Annual grass and broadleaf weeds
May be applied for pre-emergence control of certain weed species listed on the label. For effective control, Treflan 4EC should be mechanically incorporated based on the label direction. Treflan 4EC does not control emerged weeds. Do not apply to vineyards within 60 days of harvest.			
<p>¹The list is current as of July 2020; however, labels change frequently, and the herbicide's current label should be reviewed for the most recent conditions or restrictions before the product is used. Read all labels (including the supplemental labels if applicable) carefully and comply with their site-use directions (e.g., pre-harvest interval, restricted-entry interval, registration). For the very latest label information on a given herbicide, contact the manufacturer, Cooperative Extension Service office in your area (https://aces.nmsu.edu/county), or the company or distributor that sells the product. Also, most chemical labels can be accessed via various online databases, including GreenBook (http://www.greenbook.net), CDMS (http://www.cdms.net), Agrian (http://www.agrian.com/home/), and Mobile Access to Pesticide Labels (MAPL; http://pi.ace.orst.edu/mapl/).</p> <p>²Herbicide groupings follow the Weed Science Society of America's (WSSA) nationally accepted grouping. The grouping is based on the mechanisms of action of herbicides; for effective herbicide resistance management, it is imperative to rotate or mix the herbicides from different groups. A summary of herbicide mechanism of action according to WSSA is available at http://wssa.net/wp-content/uploads/WSSA-Mechanism-of-Action.pdf.</p> <p>³Other trade names of the active ingredients alone or in combination may be available in the market. Growers are advised to read the herbicide label for selecting the correct rates based on the environmental conditions of their area. Refer to the label of each product for information regarding required adjuvants.</p>			

Brand names appearing in publications are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. Persons using such products assume responsibility for their use in accordance with current label directions of the manufacturer.

The pesticide recommendations in this publication are provided only as a guide. The authors and New Mexico State University assume no liability resulting from their use. Please be aware that pesticide labels and registration can change at any time; by law, it is the applicator's responsibility to use pesticides ONLY according to the directions on the current label. Use pesticides selectively and carefully and follow recommended procedures for the safe storage and disposal of surplus pesticides and containers.

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