

Contra Costa County

DECISION DOCUMENTATION TREE for WEED MANAGEMENT on Camino Tassajara Medians

Date: 8/14/13

Department: Grounds Division

Location: Camino Tassajara medians in Danville between Conejo and Shadow Creek (~1 mi.)

Situation: Weed management on Special District medians ranging in width from 2 to 10 ft. These medians are planted with sycamores, 10 different kinds of shrubs (some of which are hedges), including roses, *Cotoneaster*, and *Rhaphiolepis*. There is no grass on these medians. Some medians are mulched, others are not, and all are watered by drip irrigation. Traffic on the road averages 55 to 60 mph, and staff cannot block lanes to work because it causes major traffic problems. They do use traffic cones to block turnouts.

Note that Special Districts vary widely in the funding available for their maintenance. In newer housing developments there is more money while in most of the older developments, the assessments are far below what it costs to maintain the landscaping. In San Pablo and Richmond funding can vary greatly from one side of the street to the other.

What are the management goals for the site or weed?	For medians in Danville, where citizens expect aesthetically pleasing landscaping, the goals are • to maintain the medians "weed-free"—this means that weed growth 1" to 2" tall is acceptable • to maintain the medians to an aesthetic standard that is just at or below the complaint level • to concentrate management efforts on the areas near stoplights and stop signs because people notice the condition of the medians when they slow down and/or stop	
How often is the site monitored?	The site is monitored weekly.	
Weeds have been identified as the following:	Various grasses, including wild oats, and various broadleaf weed including, vetch, bristly oxtongue, prickly lettuce, spurge, filaree, willow herb, dandelion, clover.	
Are populations high enough to require control? Explain	The Division manages weeds as necessary to meet the goals stated above.	
Is this a sensitive site?	Is this a "highly sensitive site" as defined by PWD Environmental staff?	No
	Is this under the RMA with Fish and Game?	N.A.
	Are any areas part of the court-ordered injunctions? (see: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay) The area from Conejo to approximately 96 yds to the east along Camino Tassajara is included in the San Joaquin kit fox injunction area. See attached map. Shadow Creek Dr. is farther to the east and is not in the injunction area. However, none of the pesticides used by grounds in this area is part of the injunction.	Yes
	Is this a known or potential habitat for any endangered or threatened species? San Joaquin kit fox	Yes

	Is it on or near an area where people walk or children play?	No
	Is it near a drinking water reservoir?	No
	Is it near a creek or flood control channel? The eastern end of this area of medians is near the Shadow Creek Detention Basin.	Yes
	Is it near crops?	No
	Is it near desirable trees or landscaping?	Yes
	Is the soil highly permeable, sandy, or gravelly? There is lots of clay in the soil there, but for most sites, the soil is an artificial mix.	No
	Is the ground water near the surface? Drilling logs from the vicinity indicate ground water could be from 10 to 22 ft. from the surface.	Unknown
Which cultural controls were considered?	Mulching: This is used in some areas. Grounds can mulch periodically when there is enough money in this particular Special District budget. An extensive mulching project would depend on whether or not the Special District Zone considered it a priority and wanted to pay for it. Mulching is very expensive, especially if the mulch must be purchased. The mulch plus labor to spread it can cost from \$5K to \$10K per ¼ mile at an average width of 8 to 12 ft. Mulching is easiest where the median is flat, rather than mounded. In areas where the median is built up into a little hill, the mulch falls or blows off into the street. If mulch were to be used on those areas, the median would have to be completely redesigned to remove the hill as well as enough soil below the curb to allow space for the mulch in order to keep it from moving into the roadway. Grounds can recommend changes such as this, but the Division does not have control over design or planting, only maintenance. Grounds must also consider the aesthetic of mulching. In an area where mulching is possible for a 10 foot stretch and then not for 50 more feet before another 10 foot stretch, the look would not be uniform, and people would complain. Weed barrier/sheet mulching: This is very labor-intensive and expensive. Installing a weed barrier or sheet mulch around established plants is not easy and is less effective because it is difficult to prevent gaps around the plants. In a short period of time, weed seeds blowing in from surrounding areas will begin to germinate on top of the weed barrier in any soil that has accumulated or in the mulch applied on top of the weed barrier. Restricting irrigation to reduce weed growth: The medians are irrigated with spaghetti tubing with drip emitters or bubblers. Directing irrigation water only to the areas around desirable plants can greatly reduce weed growth. Planting Desirable Species: Grounds is only in charge of maintenance and not design or planting. Special Districts is alerted when there are plant problems, but there may or may not be funds for changes and it may or may not be a priority. When Special Districts does a re-landscaping project they do consult the Grounds Manager about maintenance issues. Dense plantings to shade out weeds: In some areas the plantings are dense, but Grounds has no control over planting. Hardscaped medians: The medians on the eastern end of Camino Tassajara are paved and have evenly spaced openings for a tree and some herbaceous plants. These are ideal for ease of maintenance. The few weeds that come up in the pavers can be handpulled. This design also reduces water use and planting costs. CONCLUSIONS: The kind of cultural control that can be used on these medians is driven by the funds available in their particular Special District budget and the priorities in the Zone. Mulching is preferred where it can be employed and where there is money available for the installation. Drip irrigation is being used to reduce weed growth. Dense plantings in some areas also suppress weed growth. Hardscaped medians greatly reduce the amount of maintenance and weed control needed. The use of other cultural controls is not practical or not possible at this time. Note that Grounds does not have control over planting or design for these medians.	
Which physical controls were considered?	Pruning for the health of the plant: Every 3 or 4 years when enough money has been saved in this Special District budget, Grounds hires a contractor to prune the sycamores. Currently, it is better to contract this work out because necessary tree cutting vehicles are not yet back in the Grounds' budget. Staff prunes shrubs when there is time and when pruning is needed. Handpulling weeds: This is done whenever there is a low enough density of weeds. Staff handpull, rather than weed whack plants that are going to seed to avoid scattering seed everywhere. Mowing by hand: Weed whacking is used wherever and whenever possible.	

	Mowing by machine: This is not appropriate or possible on these medians. Grazing: Grazing is not appropriate on a median. CONCLUSIONS: Pruning is used for the health of the trees and bushes, and weed whacking is used as much as possible within the budget. Handpulling is used whenever the weed density is low and especially for weeds with seed heads.
Which biological controls were considered?	CONCLUSIONS: Biological controls are not applicable in this situation.
Which chemical controls were considered? For more information on pesticides listed here visit the National Pesticide Information Center (NPIC). This a joint project of Oregon State University and the US EPA. http://npic.orst.edu/ You can communicate with an actual person at 1.800.858.7378 or npic@ace.orst.edu They are open from 8:00AM to 12:00PM Pacific Time, Mon-Fri	During many years of research, experience, and experimentation, including consulting the literature, researchers, and colleagues about materials that are labeled for, and effective on, weeds in rights-of-way, the Division has considered the herbicide options listed below. The Division continues to consult researchers and colleagues, as well as new literature, to identify new choices that may be more effective, more environmentally friendly, and of lesser human toxicity. Pesticides may potentially exhibit both acute and chronic toxicity. The Signal Words below refer to acute hazards. For information on chronic toxicity, contact NPIC (info on left). Herbicides and application methods are chosen that prevent or minimize the potential for drift and exposure to humans and wildlife. As with all weed control techniques, herbicides must be reapplied periodically to suppress weeds over the long term. Note that the Weed Science Society of America (WSSA) and the Herbicide Resistance Action Committee (HRAC) both create resistance group designations to help weed managers reduce the likelihood of creating resistant weeds. Possible herbicide choices: <u>Pre-Emergent Herbicides</u> Prodiamine (Barricade®): This is a selective pre-emergent to control susceptible broadleaves and grasses. This herbicide has not been used for many years, but may be used again as part of a rotation to prevent weed resistance. Dithiopyr (Dithiopyr 40 WSB®): This is a selective, systemic, pre-emergent and early post-emergent that will control or suppress more than 40 different annual grass and small-seeded broadleaf weeds including, wild oats, annual bluegrass, oxalis, chickweed, geranium, maretail pigweed, purslane, and spurge. It will not harm nearby flowers, shrubs, or trees, but direct applications to ornamental plants should be avoided. Dithiopyr 40 WSB requires at least ½" of rain or irrigation to activate it. Signal Word (indicates acute, or immediate, toxicity): CAUTION Rate: 10 oz./100 gal. of water Timing: Pre-emergence to early seedling; applied before 1st rains in fall to prevent germination of winter weeds and in spring around April to prevent germination of spring weeds Material cost: \$80/acre Isoxaben (Gallery®): Gallery is a selective pre-emergent herbicide that prevents the growth of 95 species of broadleaf weeds for up to eight months. It must be activated by light cultivation or at least 1/2 inch of rainfall or sprinkler water within 3 wks. of application to set up a solid control area around weed seedlings. As the weed seeds germinate, Gallery disrupts and halts root and stem development of the weeds, so seedlings gradually die before they ever break the soil surface. Control includes prickly lettuce, bristly oxtongue, clover, filaree, willow herb, dandelion. Signal Word (indicates acute, or immediate, toxicity): CAUTION Rate: 0.9 lb./acre. Timing: Pre-emergence to early seedling; applied before 1st rains in fall to prevent germination of winter weeds and in spring around April to prevent germination of spring weeds Material cost: \$350/acre <u>Post-Emergent Herbicides</u> Glyphosate (Roundup®): This is a systemic herbicide that will kill almost any type of vegetation—grass, broadleaf, vines, brush, etc. Signal Word (indicates acute, or immediate, toxicity): CAUTION Rate: 9 oz./ 3 gallon backpack sprayer (used to spot treat weeds) Timing: Seedling to mature plant, ideally before seed set; the smaller the weed, the less herbicide required Material cost: \$13.60/acre Fluazifop-P-butyl (Fusillade 2000®): This is a systemic herbicide for the control of annual and perennial grasses. This herbicide is not used because there is not a large enough volume of grass weeds on these medians. Triclopyr: Grounds uses triclopyr only for hard to control weeds (mostly woody plants such as ivy), stumps, and invasive weeds, so it would not be appropriate for the weeds on medians.

	<u>Herbicides with both Pre- and Post-Emergent Action</u> Flumioxazin (SureGuard®): Flumioxazin is a preemergent and fast postemergent for the control of broadleaf and grassy weeds in landscape settings. It is taken up by roots and foliage of plants (it is primarily absorbed by the roots of treated plants following soil applications). Pre-emergence: Pre-emergent weed control is most effective when SureGuard is applied to clean, weed-free soil, mulch, or gravel surfaces prior to weed emergence. Moisture at some time following the application is necessary to properly activate the herbicide. Dry weather following application of SureGuard may reduce effectiveness. However, when adequate moisture is received after dry conditions, SureGuard will control susceptible germinating weeds. Post-emergence: Flumioxazin can be tank mixed with a postemergent herbicide, such as glyphosate when weeds are present. Tank mixtures of flumioxazin with glyphosate provide faster and more effective weed control than glyphosate alone. The flumioxazin provides long-lasting residual weed control with a single application. Flumioxazin should not be applied to the foliage of ornamental plants. Note: Grounds does not use flumioxazin alone as an herbicide Signal Word (indicates acute, or immediate, toxicity): CAUTION Rate: 1/3 oz./3 gallon backpack sprayer Timing: Seedling to mature plant, ideally before seed set; the smaller the weed, the less herbicide required. It can provide residual control for 4 to 10 months. Cost: \$154/acre (@ 11oz/acre) CONCLUSIONS: Mulching is preferred wherever it can be used, but when an herbicide is needed, Grounds uses isoxaben and dithiopyr as pre-emergents to reduce the amount of post-emergent herbicide use and to reduce the amount of time that staff must work on these dangerous medians. These 2 herbicides are usually applied both in fall and spring because different weeds germinate at different times. Both pre-emergents are used because they each target somewhat different weed species. Grounds uses glyphosate alone and glyphosate mixed with flumioxazin to control weeds that escape the pre-emergent treatments. Post emergent treatments are mostly spot treatments done with a backpack sprayer. Glyphosate + flumioxazin is applied in areas where there is a dense enough stand of weeds to not waste the glyphosate and an extensive enough area that the 3 gallons of spray mix in the backpack can be used up. After flumioxazin is mixed with water, it must be applied within 12 hours. Currently only Lead Gardeners are allowed to use glyphosate mixed with flumioxazin. Grounds is seeing a large decrease in the weed populations on these medians now that they have been using flumioxazin. This is presumably because of the synergistic effect that flumioxazin has on glyphosate and because of the pre-emergent quality of flumioxazin.
Which herbicide application methods are available for this chemical?	Methods available: Broadcast from a truck with a boom; spot-sprayed pulling hose from a truck; spot-sprayed with a backpack sprayer CONCLUSIONS: The pre-emergents are applied by pulling hose from a truck wherever a truck can get in to the areas needing treatment. In other areas a backpack sprayer is used. Glyphosate or glyphosate plus flumioxazin are spot-applied using a backpack sprayer. Broadcast application with a boom from a truck is not used because it wastes large amounts of herbicide.
What factors were considered in choosing the pesticide application method?	Staff safety is the first consideration. Other considerations are the effectiveness and precision of the method, the extent of the area needing treatment and its location, the time of year, the size and kind of weeds, the possibility of pesticide runoff, risks to non-target species, endangered species issues, and the cost to the Division.
What weather concerns must be checked prior to application?	For any herbicide, a primary concern is wind since it can carry herbicides off-site, onto non-target plants or to sensitive areas. For glyphosate, heavy rain soon after application may wash the herbicide off the plant necessitating an additional application. Glyphosate should not be applied during a temperature inversion because drift potential is high. For isoxaben, rain must occur within 21 days in order to activate the herbicide. The soil should be slightly moist and not bone dry in order to ensure that the herbicide clings to the soil. Flumioxazin requires moisture to activate the herbicide, but it is not time-sensitive. Dithiopyr 40 WSB requires activation by at least ½" of rain or irrigation.