Chart 1. Susceptibility of Annual Broadleaf Weeds to Herbicides Registered in Pistachio Orchards in California

	Preemergence							Postemergence								
C = Control P = Partial control N = No control -- = No information	**FLUM**	**ISOX - NB**	**NAPR**	**ORYZ**	**OXYF**	**PEND - NB**	**THIA - NB**	**CLET - NB**	**DIQU - NB**	**FLUA - NB**	**GLYP**	**HALO**	**OXYF**	**PARA**	**SETH - NB**	**2,4-D**
Annual Broadleaves																
Ann. morninglories	C	C	P	P	C	N	--	N	P	N	C	P	C	P	N	P
Cheeseweed	C	C	P	P	C	P	P	N	N	N	P	N	C	P	N	P
Chickweeds	C	C	C	C	P	C	P	N	C	N	C	C	N	C	N	N
Clovers	--	P	P	N	P	N	--	N	P	N	P	N	N	P	N	N
Cockleburs	--	--	P	N	P	N	N	N	P	N	C	C	C	C	N	C
Cudweeds	--	C	C	N	N	N	C	N	N	N	C	N	C	N	N	P
Fiddlenecks	--	C	C	C	C	C	C	N	P	N	C	N	C	P	N	P
Filarees	C	C	C	P	C	N	C	N	P	N	P	N	C	P	N	C
Goosefoot, nettleleaf	C	C	C	C	C	C	C	N	C	N	C	N	C	C	N	C
Groundcherries	C	C	N	N	C	N	P	N	C	N	C	N	C	C	N	C
Groundsel, common	C	C	P	P	C	N	C	N	C	N	C	C	C	C	N	P
Hairy fleabane	P	C	N	N	P	N	P	N	C	N	C	N	P	P	N	C
Henbit	C	C	P	C	C	C	P	N	C	N	C	N	C	C	N	P
Horseweed	C	C	N	N	P	N	P	N	P	N	C	N	P	P	N	C
Knotweed, common	--	C	C	C	P	C	C	N	P	N	P	N	N	P	N	P
Lambsquarters, common	C	C	C	C	C	C	P	N	C	N	C	N	C	C	N	C
London rocket	C	C	C	P	C	P	P	N	C	N	C	C	P	C	N	C
Mullein, turkey	--	C	P	N	P	N	C	N	P	N	P	N	N	P	N	P
Mustards	C	C	P	N	C	P	P	N	C	N	C	C	P	C	N	P
Nettles	C	C	P	P	C	N	C	N	P	N	N	C	C	P	N	P
Nightshades	C	C	N	N	C	N	P	N	C	N	C	N	C	C	N	C
Pigweeds	C	C	C	C	C	C	P	N	C	N	C	P	C	C	N	P
Prickly lettuce	P	C	C	N	C	N	C	N	P	N	C	C	P	P	N	C
Primrose, cutleaf evening	--	C	P	P	P	P	C	N	C	N	C	N	P	C	N	--
Puncturevine	C	C	P	C	P	P	P	N	C	N	C	N	P	C	N	P
Purslanes	C	C	C	C	C	C	C	N	C	N	C	P	P	C	N	P
Russian thistle	C	C	P	P	P	P	P	N	C	N	C	N	N	C	N	P
Shepherd's-purse	C	C	P	N	C	P	C	N	P	N	C	C	C	P	N	C
Sowthistles	P	C	C	P	C	N	C	N	P	N	C	C	C	P	N	P
Spotted spurge	C	C	C	P	P	P	P	N	C	N	C	N	N	C	N	P
Wild radish	C	C	P	P	C	N	C	N	C	N	C	C	P	C	N	C
Willowherb, panicle	C	P	N	P	C	--	--	N	P	N	P	--	N	N	N	P

NB = Non-bearing vineyards

CLET = clethodim (Prism)
DIQU = diquat (Reglone)
FLUA = fluazifop (Fusilade)
FLUM = flumioxazin (Chateau)
GLYP = glyphosate (Roundup, Touchdown)
HALO = halosulfuron (Sempra CA)
ISOX = isoxaben (Gallery T&V)
NAPR = napropamide (Devrinol)
ORYZ = oryzalin (Surflan)
OXYF = oxyfluorfen (Goal)
PARA = paraquat (Gramoxone)
PEND = pendimethalin (Prowl)
SETH = Sethoxydim (Poast)
THIA = thiazopyr (Visor)
2,4-D = (various trade names)

This is not an endorsement for of any trade names listed, nor does the omission of specific trade names reflect the view of the author. Please refer to your local dealer or chemical representative for specific herbicide products available.

This chart is not intended to be a recommendation for the use of herbicides. Refer to the appropriate label for application recommendations. Proper weed identification, timing, and accurate application are imperative for effective control. The information in this chart is tentative and may change as warranted. Always follow the label carefully when using herbicides. Kurt J. Hembree, Farm Advisor, Fresno County. Feb. 2005.

Chart 2. Susceptibility of Annual Grass and Perennial Weeds to Herbicides Registered in Pistachio Orchards in California

	Preemergence							Postemergence								
C = Control P = Partial control N = No control -- = No information	**FLUM**	**ISOX - NB**	**NAPR**	**ORYZ**	**OXYF**	**PEND - NB**	**THIA - NB**	**CLET - NB**	**DIQU - NB**	**FLUA - NB**	**GLYP**	**HALO**	**OXYF**	**PARA**	**SETH - NB**	**2,4-D**
Annual Grasses																
Annual bluegrass	C	N	C	C	P	C	C	C	P	N	C	N	N	P	N	N
Barnyardgrass	C	N	C	C	P	C	C	C	P	C	C	N	P	P	C	N
Bromegrasses	P	N	C	C	N	C	C	P	P	P	C	N	N	P	P	N
Canarygrass	P	N	C	C	P	C	C	C	P	C	C	N	N	P	C	N
Crabgrass, large	C	N	C	C	N	C	C	C	C	C	C	N	N	C	C	N
Fescues	P	N	C	C	N	C	P	P	P	P	C	N	N	P	P	N
Foxtails	C	N	C	C	N	C	C	C	C	C	C	N	N	C	C	N
Junglerice	C	N	C	C	P	C	C	C	P	C	C	N	P	P	C	N
Lovegrass	C	N	C	C	P	C	P	C	P	C	C	N	N	P	C	N
Ryegrass, Italian	P	N	C	C	N	C	C	C	P	C	C	N	N	P	C	N
Sandbur	C	N	C	P	N	C	C	C	P	C	C	N	N	P	C	N
Sprangletops	P	N	C	C	N	C	C	C	N	C	C	N	P	N	C	N
Wild barley	P	N	C	C	P	C	C	C	P	C	C	N	N	P	C	N
Wild oat	C	N	C	C	P	P	--	C	P	C	C	N	N	P	C	N
Witchgrass	P	N	C	C	P	C	--	C	P	C	C	N	N	P	C	N
Perennials (seedling)																
Bermudagrass	N	N	C	C	N	C	C	C	P	C	C	N	N	P	C	N
Dallisgrass	--	N	C	C	N	C	C	C	N	C	C	N	N	N	C	N
Johnsongrass	C	N	C	C	N	C	C	C	C	C	C	N	N	C	C	N
Field bindweed	--	C	N	P	N	P	C	N	P	N	C	N	N	P	N	P
Perennials (established)																
Bermudagrass	N	N	N	N	N	N	N	P	N	P	P	N	N	N	P	N
Dallisgrass	N	N	N	N	N	N	N	P	N	P	P	N	N	N	P	N
Johnsongrass	N	N	N	N	N	N	N	P	N	P	P	N	N	N	P	N
Field bindweed	N	P	N	N	N	N	P	N	N	N	P	N	N	N	N	N
Nutsedge, purple	N	N	N	N	N	N	P	N	N	N	P	C	N	P	N	N
Nutsedge, yellow	N	N	N	N	N	N	P	N	N	N	P	C	N	P	N	N

NB = Non-bearing vineyards

CLET = clethodim (Prism)
DIQU = diquat (Reglone)
FLUA = fluazifop (Fusilade)
FLUM = flumioxazin (Chateau)
GLYP = glyphosate (Roundup, Touchdown)
HALO = halosulfuron (Sempra CA)
ISOX = isoxaben (Gallery T&V)
NAPR = napropamide (Devrinol)
ORYZ = oryzalin (Surflan)
OXYF = oxyfluorfen (Goal)
PARA = paraquat (Gramoxone)
PEND = pendimethalin (Prowl)
SETH = Sethoxydim (Poast)
THIA = thiazopyr (Visor)
2,4-D = (various trade names)

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This chart is not intended to be a recommendation for the use of herbicides. Refer to the appropriate label for application recommendations. Proper weed identification, timing, and accurate application are imperative for effective control. The information in this chart is tentative and may change as warranted. Always follow the label carefully when using herbicides. Kurt J. Hembree, Farm Advisor, Fresno County. Feb. 2005.

Table 1. Performance of Preemergence Herbicides in Pistachios in California

Herbicide	Conditions favoring effective weed control and crop safety
flumioxazin (Chateau)	Used at 0.188-0.38 lb a.i./acre in bearing and non-bearing orchards. Applied as a directed spray, being careful to avoid contact with young wood or foliage. Rainfall or irrigation of ¼ to ½" required within 21 to 28 days after treatment for activation. Can be tank-mixed with other residual herbicides for broader weed control and contact herbicides for burndown of weeds already present. Provides about 1 month residual control for each 2 oz/acre product used. Helps provide preemergence control of annual grasses, marestail, hairy fleabane, and other annual broadleaves.
isoxaben (Gallery T&V)	Used at 0.66-1.33 lb a.i./acre in non-bearing orchards only. It controls broadleaf weeds only. Application made after trees have completely settled into the soil. Rainfall or irrigation of at leas 0.5" needed within 21 days of treatment. Apply in at least 10 gal water/acre. PHI: 365 days..
napropamide (Devrinol)	Used at 4.0 lb a.i./acre in bearing and non-bearing orchards. Apply to the soil surface in 20 to 40 gal water/acre. Must be incorporated by rainfall or sprinkler irrigation within 7 days of treatment. Residual control is reduced under frequent, low-volume drip or micro-sprinkler irrigation. It should be combined with post-emergence herbicides if weeds are emerged. Residual period is 4-10 months.
oryzalin (Surflan)	Used at 2.0-6.0 lb a.i./acre in bearing and non-bearing orchards. Applied to soil free of leaves and other debris in 20 to 60 gal water/acre. Rainfall or irrigation of ¼ to 2" needed within 21 days of treatment. It is often combined with oxyfluorfen for broad-spectrum weed control. A post-emergence herbicide should be added if weeds are emerged. Applied at 6 lb a.i. for longer residual control. Chemigation is possible-refer to label. Residual period is 4 to 10 months.
oxyfluorfen (Goal)	Used at 1.2-2.l lb a.i./acre in bearing and non-bearing orchards. Applied in 20 to 60 gal water/acre. Rainfall or irrigation of at leas 3/4" needed within 21 to 28 days of treatment. Do not disturb the soil following treatment, or poor weed control will result. It is often combined with oryzalin for broad-spectrum weed control. Refer to the label for use period, cut-off dates, and other restrictions. Residual period is 4 to 10 months.
pendimethalin (Prowl)	Used at 2.0-4.0 lb a.i./acre in non-bearing orchards only. Applied in 20 to 40 gal water/acre to soil surface. Rainfall, irrigation, or mechanical incorporation required within 4 days of treatment. Directed at base of trees during dormant season, avoiding contact with foliage. PHI: 365 days.
thiazopyr (Visor)	Used at 0.5-1.0 lb a.i./acre in non-bearing orchards only. Applied in 20 to 40 gal water/acre. Applied at 0.5 lb a.i. in the fall and again in the late-winter for nutsedge control. Rainfall is needed within 21 days of treatment. Increased rainfall improves nutsedge control. Residual period is 5 to 8 months. PHI: 365 days.

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Numerous factors influence the performance of herbicides. The observations and comments in this table assume proper weed identification and accurate application and timing of treatments. Consult Charts 1 and 2 and the proper herbicide labels for the effectiveness of the registered herbicides to control your specific weeds. This table is not intended to be a recommendation for the use of herbicides. Always follow the label carefully when using herbicides. Kurt J. Hembree, Farm Advisor, Fresno County. Feb. 2005.

Table 2. Performance of Postemergence Herbicides in Pistachios in California

Herbicide	Conditions favoring effective weed control and crop safety
clethodim (Prism)	Used at 0.09-0.25 lb a.i./acre in non-bearing orchards only. A crop oil concentrate (1% v/v) or a non-ionic surfactant (0.25% v/v) is added. Applied in 20 to 40 gal water/acre with thorough weed coverage. Gives selective control of annual grasses (except bromes and fescues) that are actively growing, before tillering, and not stressed. Repeat applications are required on perennials when their growth is according to label. PHI: 365 days.
diquat dibromide (Reglone)	Used at 0.375-0.5 lb a.i./acre in non-bearing orchards only. A non-ionic surfactant is added at 0.25% v/v. Applied in 20 to 60 gal water/acre with thorough weed coverage. Weeds are less than 4" tall. Control is improved during warm, dry weather. PHI: 365 days.
fluazifop-p-butyl (Fusilade)	Used at 0.25-0.375 lb a.i./acre in non-bearing orchards only. A crop oil concentrate (1% v/v) or a non-ionic surfactant (0.25% v/v) is added. Applied in 20 to 40 gal water/acre with thorough weed coverage. Gives selective control of annual grasses (except annual bluegrass, bromes, or fescues) that are actively growing, before tillering, and not stressed. Repeat treatments are required on perennials when their growth is according to label. PHI: 365 days.
glyphosate (Roundup, Touchdown)	Used at 0.4-4.0 lb a.i./acre in bearing and non-bearing orchards. Applied by ground with low-pressure, flat fan nozzles, a controlled droplet applicator, or a smart sprayer system. Adding ammonium sulfate at 5 to 10 lb/100 gal water may improve control. For annual weeds, use 1.0 lb a.i. in 3 to 40 gal water/acre. Apply to young, actively growing annual weeds or perennials when they are flowering. Some perennials may require highest label rate. Avoid drift onto green wood or foliage of trees or injury will result. Weeds should not be cultivated for 7 to 14 days after treatment to maximize control. Can be combined with low rates of oxyfluorfen for broader weed control, as well as combined with pre-emergence herbicides. PHI: 3 days.
halosulfuron (Sempra CA)	Used at 0.032-0.063 lb a.i./acre in bearing and non-bearing orchards. A non-ionic surfactant is added at 0.25% v/v. Trees must be completely settled in the soil before treatment. Avoid contact with tree foliage and roots, especially in soils that crack, or injury could result. Used where nutsedge is the main weed at the 4 to 5 leaf stage. Applied by ground with low-pressure, flat fan nozzles. Do not use a controlled droplet applicator. Sprayer is cleaned after application according to label. Clean soil is used for replants when previously treated. PHI: 1 day.
oxyfluorfen (Goal)	Used at 0.5-1.0 lb a.i./acre in bearing and non-bearing orchards. Applied during dormant period or following bloom (according to label directions) to weeds at the 4-leaf stage or sooner. Combined with glyphosate or other post-emergence herbicides to control specific weeds.
paraquat (Gramoxone)	Used at 0.3-0.9 lb a.i./acre in bearing and non-bearing orchards. A non-ionic surfactant is added at 0.5% v/v. Applied in 20 to 60 gal water/acre with thorough weed coverage. Weeds are less than 4" tall. Repeat applications needed as new growth occurs. A restricted herbicide, requiring a permit from the county agricultural commissioner for purchase and use. PHI: 7 days.
sethoxydim (Poast)	Used at 0.28-0.47 lb a.i./acre in non-bearing orchards only. A crop oil concentrate is added at 1% v/v. Applied in 20 to 40 gal water/acre with thorough weed coverage. Gives selective control of annual grasses (except annual bluegrass, bromes, or fescues) that are actively growing, before tillering, and not stressed. Repeat treatments are required on perennials when their growth is according to label. PHI: 365 days.
2,4-D amine (Weedaxe)	Used at 1.0-1.4 lb a.i./acre in bearing and non-bearing trees that are at least 1 year old. Selective on small, vigorous broadleaf weeds. Applications made on sandy soil, when windy, when trees are in bloom, or under hot conditions can result in injury. Do not make application before an irrigation or rainfall or injury could result. Sprayer is cleaned after application according to label.

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