

INSECT CONTROL IN RECREATION AREAS

Insect	Insecticide	Rate	Application	Comments/Precautions
Ants	carbaryl (Sevin 50 WP and baits)	6-8 oz/1,000 sq ft		Treat mounds and surrounding area or apply broadcast.
	pyrethroids (Advanced Garden, Deltagard, Scimitar, Talstar, Tempo)	See label		
Ants (Red Imported Fire)	Apply all bait products when ants are active and soil temperature is above 60 degrees F. Do not treat if rain is anticipated within 6 hours.			
	abamectin B1 (Ascend, Varsity)	5-7 Tbsp/mound 1 lb/A	Mound-to-mound treatment rate Broadcast rate	
	acephate (Orthene T, T&O) 75 S (Ortho Orthene Fire Ant Killer1) 50 S	1-2 tsp/mound 1 Tbsp/mound	Distribute uniformly over mound.	For best results, apply in early morning or late afternoon.
	fenoxycarb (Award, Hi-Yield Fire Ant Bait)	1-3 Tbsp/mound 1.0-1.5 lb/A	Mound-to-mound treatment rate Broadcast rate	This is an insect growth regulator (IGR).
	fipronil (Chipco FireStar) fire ant bait	5 Tbsp/mound 1.5-15 lb/A	Mound-to-mound treatment rate Broadcast rate	The fipronil products have the same active ingredient but are different formulations. Read and follow the label.
	(Top Choice) .0143% granular contact insecticide (Chipco Choice) 0.1% granular contact insecticide	87 lb/A 12.5 lb/A	Broadcast only Broadcast only	
	hydramethylnon (Amdro, Amdro Pro, Combat Fire Ant Bait, MaxForce)	2-5 Tbsp/mound 1.0-1.5 lb/A	Mound-to-mound treatment rate Broadcast rate	
	indoxacarb (Advion) 0.045%	4 Tbsp/mound 1.5 lb/A	Distribute uniformly around mound. Broadcast rate	
	pyrethroids (various) bifenthrin (Talstar) cyfluthrin (Tempo) deltamethrin (Deltagard) λ-cyhalothrin (Scimitar WP, CS, GC) (Battle) permethrin (various)	see label		
	pyriproxyfen (Distance, Esteem)	1-4 Tbsp/mound 1.0-1.5 lb/A	Mound-to-mound treatment rate Broadcast rate	This is an IGR.
	S-methoprene (Extinguish)	3-5 Tbsp/mound 1.0-1.5 lb/A	Mound-to-mound treatment rate Broadcast rate	This is an IGR.
	S-methoprene + hydramethylnon (Extinguish Plus)	3-5 Tbsp/mound 1.0-1.5 lb/A	Mound-to-mound treatment rate Broadcast rate	This is an IGR plus a toxicant.
	spinosad (Eliminator Fire Ant Bait, Ortho Fire Ant Bait)	4-6 Tbsp/mound 2.5-5.0 lb/A	Mound-to-mound treatment rate Broadcast rate	

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Midge	temephos (Abate)			Double recommended rates for water high in organic content.
	1 G	---	5-10 lb	
	2 G	---	2.5-5 lb	
	5 G	---	2 lb	
	methoprene 20% EC (Strike)	4-5 oz/1 million gal wastewater	—	For use in wastewater treatment facilities. Uniformly apply at the influent side over a 24-hour period. Apply to natural and manmade aquatic habitats. High rate recommended for wastewater.
	4.25% pellet (Strike)	—	5-10 lb/acre	
	Spinosad (Natular XRG) 2.5% G	ready to use	5-20 lb	
Ticks and Chiggers	carbaryl (Sevin 50WP)	0.1 lb/10 gal water	870 gal/acre	Keep children and pets off treated areas until dry. Keeping the grass mowed and the shrub growth down will go a long way toward reducing ticks and chiggers. Treat areas along paths and trails, especially tall grass and shrubs that are not frequently mowed. Repeat every 4 to 6 weeks.
	cyfluthrin (Tempo) 24% EC	5.9 fl oz/40-100 gal water	40-100 gal/acre	
	20% WP	7.7 oz		
	tetrachlorvinpos (Rabon) 50% WP	0.1 lb/gal water	21.8 gal/acre	

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Insect	Insecticide	Mixing Instructions and Application Equipment	Application Rate @ 10 mph	Droplet Size Requirements on Label (µm)	Comments/Precautions
Mosquitoes, Adults (Ground application)	Malathion ULV 96.5%	Use undiluted on aerosol ULV sprayer. Dilute 3.9-5.2 gal to 100 gal with No. 2 fuel or diesel oil; use in thermal fog sprayer.	2.0-4.3 fl oz/min	6 to 48 µm MMD = 17 µm	Apply only when weather conditions are favorable. Wind and rising air currents may cause undesirable spray drift and reduce insect control. Avoid direct application to vehicles as paint damage may result. Toxic to fish, aquatic invertebrates and aquatic life stages of amphibians.
	naled (Dibrom) 87.4% concentrate	10 fl oz to 10 gal No. 2 fuel or diesel oil; use in thermal fog sprayer. Dilute 0.5 gal to 5 gal with soybean oil or HAN; use in ULV sprayer.	80 gal/hr 6-12 fl oz/min	11 to 20 µm MMD = 15 µm	Toxic to fish, aquatic invertebrates, and wildlife. Do not directly apply to water or to areas where runoff into water is likely to occur.
	permethrin 10%-57% concentrate	Apply undiluted or mix with refined mineral or soybean oil.	0.31-15 oz/min depending on dilution	MMD = 8 to 30 µm	
	(Permanone) 10% EC	Dilute 1:20 with water (6.5 fl oz/1 gal water).			Treat surfaces using coarse wet spray. Spray to runoff.
	permethrin (20%) and piperonyl butoxide (20%) (Aqua-Reslin)	Dilute 1 gal with 2-12 gal water.	2.1-9.0 oz/min depending on dilution	MMD = 8 to 20 µm	Dilute with water only. Toxic to fish and aquatic invertebrates.
	permethrin and piperonyl butoxide (Permanone 31-66 Biomist 4+12 ULV Biomist 30+30 ULV)	Dilute 1 to 2.4 gal with light-weight oil; use in ULV sprayer. Mix 1:2 with solvent. Mix 1:4 with solvent. Mix 1:8 with solvent.	0.5-3.0 fl oz/min 1.5-6.0 fl oz/min 2.5-10.0 fl oz/min 4.5-18.0 fl oz/min	15 to 30 µm 5 to 30 µm MMD = 10 to 20 µm	Dilute Biomist 30+30 with solvent such as mineral oil. Do not apply this product within 100 ft of lakes or streams.
	resmethrin (18%) + piperonyl butoxide (54%) (Scourge)	Dilute 0.67 gal with 1 gal of light mineral oil; use in ULV sprayer.	4.5-9.0 fl oz/min	MMD = 12 µm	Restricted Use Insecticide
	SBP-1382-40MF (resmethrin) 40% concentrate	Dilute 12.5 fl oz with 1 gal of light mineral oil; use in ULV sprayer.	6 fl oz/min	MMD = 12 µm	Restricted Use Insecticide
	sumithrin and piperonyl butoxide (Anvil 10+10 ULV or 2+2 ULV)	Use undiluted or dilute 10+10 formulation with light mineral oil.	1.3-18.6 oz/min	MMD = 5 to 25 µm	

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Mosquitoes, Adults (Fixed-wing aerial application)	Malathion ULV 96.5%	Use undiluted	2.6-3.0 fl oz/acre	90% of droplets < 100 µm MMD = 50 to 60 µm	Aircraft should be operated at 150 mph or more; large droplets may spot car paint. Apply only when weather conditions are favorable. Wind and rising air currents may cause undesirable spray drift and reduce insect control. Toxic to fish, aquatic invertebrates, and aquatic life stages of amphibians. Do not directly apply to water or to areas where runoff into water is likely to occur.
	naled (Dibrom) 87.4% concentrate	Use undiluted	0.5-1.0 fl oz/acre	30 to 80 µm	Toxic to fish, aquatic invertebrates, and wildlife. Do not directly apply to water or to areas where runoff into water is likely to occur.
		Dilute 50-100 fl oz to 100 gal with No. 2 fuel oil or diesel oil	1 gal/acre	30 to 80 µm	
	sumithrin and piperonyl butoxide (Anvil 10+10 ULV or 2+2 ULV)	Use undiluted	3.8-5.7 fl oz/acre	MMD = 15 to 30 µm	
permethrin and piperonyl butoxide (Biomist 30+30 ULV)	Use undiluted	0.33-1.0 fl oz/acre	MMD = 50 µm with no less than 2.5% exceeding 100 µm	Product can be applied diluted as long as 1 fl oz/acre of Biomist 30+30 ULV is not exceeded.	

Key: MMD = Mass Median Diameter
µm = micrometer

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Insect	Insecticide	Mixing Instructions and Application Equipment	Application Rate Per Acre	Comments/Precautions
Mosquitoes Immatures	<i>Bacillus sphaericus</i> (Vectolex) CG 7.5% WDG 51.2%	ready to use ground (5-100 gal water/acre) aerial (0.5-10 gal water/acre)	5-20 lb 0.5-1.5 lb	Only effective against larvae. Apply uniformly by aerial or conventional ground equipment. Reapply as needed after 1-4 weeks. Use higher rates in areas where extended residual control is necessary or in habitats having deep water or dense surface cover.
	WSP 7.5%	ready to use	1 pouch/50 sq ft	
	<i>Bacillus thuringiensis</i> , var. <i>israelensis</i> (Bactimos, Teknar, Vectobac) 50 WP 2 WP 14.3% aqueous conc. 15% aqueous conc. 1.2% aqueous conc. 0.8% aqueous conc.	dilute with sufficient water to obtain uniform coverage	6-12 oz 4-16 oz 0.5-3.0 pt 0.5-3.0 pt 0.25-2.0 pt 0.5-2.0 pt	Only effective against larvae. Can be applied to all breeding habitats, including potable water supplies.
	<i>Bacillus thuringiensis</i> , var. <i>israelensis</i> (Bactimos) briquettes 10%	ready to use	---	
	<i>Bacillus thuringiensis</i> , var. <i>israelensis</i> (Bactimos, Teknar, Vectobac) granules 0.2% pellets 0.4%	ready to use	---	Apply 4-10 lb per acre with aircraft or ground equipment.
	malathion 57% EC	2.5 fl oz/gal water	up to 5 gal in area with heavy vegetation	
	methoprene (Altosid) 20% EC	3-4 fl oz/gal water	1 gal	Apply when larvae are in 3rd and 4th instar. Methoprene will not kill pupae or adults.
	methoprene (Altosid) briquette 2.1%, 8.6% (Altosid) pellet 4.2% (Altosid) granule 0.27%, 1.5%	ready to use	---	Water less than 2 ft; 1 briquette per 100 sq ft deeper or flowing water; 1 briquette per 10 cu ft, 2.5 to 10 lb pellet per acre; use high rate in breeding sites with high organic content.
	monomolecular surface film (Agnique MMF)	---	0.2-0.5 gal	Use in conjunction with indicator oil to avoid over treatment. Can be used for semi-permanent or permanent fresh water sources (including potable and irrigation).
	proprietary mosquito control oils (GB-1111, etc.)	---	1-5 gal	Dosage depends on amount of floatage and vegetation in water.
	Spinosad (Natular XRG) 2.5% G	ready to use	5-20 lb	
	temephos (Abate) 43% EC 1G 2G 5G	0.5-1.5 fl oz/gal water	1 gal 5-10 lb 2.5-5.0 lb 1-2 lb	