

APPENDIX A: LIST OF APPROVED PESTICIDES FOR USE IN SARASOTA COUNTY GOVERNMENT

County personnel or contractors involved in the application of pesticides must only use products on the approved list in the approved target area. Use of products other than those on this list is prohibited on any county-owned property or facilities. Products for inclusion in the IPM program must be submitted to and approved by the IPM Coordinator in consultation with the IPM Advisory Board.

INSECTICIDES (Mosquito Management)

Adult Mosquitoes

- Naled 87.4% (Dibrom® Concentrate) - aerial applications
- Sumithrin 10% (Anvil® 10x 10 UL V or equivalent) - aerial applications
- Sumithrin® 5%, Prallethrin 1 % (Duet FM Dual-action) - ground applications
- Permethrin 4%, Piperonyl Butoxide 4% (Biomist® UL V 4+4 or equivalent) - ground applications
- Lemon grass oils 3% (Aerosol sprays or equivalent)--indoor **sprays County Buildings only after hours**
- Etofenprox 20% (Zenivex or equivalent) Aerial and Ground ULV
- Deltamethrin (DeltaGuard) Aerial ULV

Larval Mosquitoes

Biological control

- *Gambusia holbrooki* (mosquito fish) - for use in isolated non-environmentally sensitive areas with permanent water including abandoned pools

Biocides: reduced risk natural biocides such as *Bacillus species* and derivatives the soil bacterium *Saccharopolyspora spinosa*

- *Bacillus thuringiensis israelensis* 2.86% (Mosquito Bits® or equivalent)
- *Bacillus thuringiensis israelensis* 2.80% (VectoBac® G or equivalent)
- *Bacillus thuringiensis israelensis* 1.2% (VectoBac® 12 AS or equivalent)
- *Bacillus sphaericus* 7.5% (Vectolex® CG or equivalent) • *Bacillus sphaericus* 51.2% (Vectolex® WDG or equivalent)
- *Bacillus sphaericus* 6%, *B. thuringiensis* 1 % (Four Star™ Briquettes or equivalent)
- Spinosad 0.5% (Natular™ G or equivalent)
- Spinosad 6.25% (Natular™ XRT or equivalent)

Insect Growth Regulators (IGRs): are in the bio-pesticide class, the use of juvenile hormone analogs interfere with the mosquito life cycle and prevents emergence of the adult mosquito with minimal non-target effects

- (S)-Methoprene 2.1 % (Altosid® XR Extended Residual Briquettes)
- (S)-Methoprene 4.25% (Altosid® Pellets)
- (S)-Methoprene 1.5% (Altosid® XRG Pre-Strike pouches or Altosid® PRO-G)

Organophosphate

- Temephos 5% (Skeeter Abate®) (when other options not viable)

Larvicide/Pupacide

- Agnique® MMF† 100%
- Agnique ® MMF G 32% (granular pupacide)
- Aliphatic Petroleum Distillate 98.7% (Golden Bear 1111 or equivalent)

Repellents

- DEET 29%‡ - insect repellent*

† Monomolecular Surface Film for Control of Immature Mosquitoes and Midges

‡ 29% or less recommended. Increased active ingredient does not increase repellency

* Brand and/or concentration not specified. Choose most appropriate least toxic option

INSECTICIDES (Building Structures, Interior/Exterior) Ants, Cockroaches

- Boric acid dusts*

- Diatomaceous Earth*
- Silica gel*
- Eugenol 2.90%, Thyme oil 0.6% (EcoEXEMPT® G) - granules for ants, cockroaches, crawling insects
- 2- Phenethyl Propionate 4.50%, Eugenol 1.75% (EcoEXEMPT® D) - dust for cracks and crevices
- Thiamethoxam 0.010% (Optigard™) - ant gel bait
- Abamectin, Borax, Orthoboric Acid, Hydramethylnon, Hydropene, Indoxacarb, Methoprene, Pyriproxyfen, Spinosad, Sufluramid - (Solid, liquid, granular and gel baits*)

Crawling Insects/Foliar Pests/Flying Insects

- Potassium Salts of Fatty Acids 49% (M-Pede®) - insecticidal soaps
- Rosemary Oil 1.0%, Peppermint oil 2% (EcoExempt® IC2) -liquid spray, crawling insects
- 2-Phenethyl Propionate 0.1 % (EcoPCO® ACU) - crawling and flying Insects
- 2-Phenethyl Propionate 1.0%, 0.4% Pyrethrins - (EcoPCO® AR X) - crawling and flying insects
- 2-Phenethyl Propionate 1.0%, Piperonyl Butoxide 3.0% (EcoPCO® Jet X) - aerosol jet spray wasp nests
- Zylam (Dinofeturan 10% or equivalent) injection for control of Rugose Spiraling Whitefly (*Aleurodicus rugioperculatus*) on Gumbo Limbo trees maintained by Sarasota County.

Wood Destroying Organisms (WDOs): Bait stations and under-slab treatments only address one form of WDOs thus; only offer limited pest management. For that reason borate pretreatments are preferred, *see more in IPM Procedures, Section 10.*

- Termites (Subterranean) monitoring/baiting systems
- Termite baits Stations* (Sentricon® or the equivalent)
- 0.25% Diflubenzuron (Labyrinth™ or equivalent) Termites (Dry wood)
- Borate Compounds* (liquid spray, mist, and foam injection) - primary control option
- Premise®* or equivalent (Imidacloprid) - gallery injection only
- Fipronil 9.1 % (Termidor® SC or equivalent) - gallery injection only as a last resort for historical buildings (pre 1940 construction) and with facilities management approval.
- Vikane (Sulfuryl Fluoride 99.8%) for fumigation by contractor to eliminate termites in County buildings deemed to be of historic significance.

Note: Trenching & barrier treatments are not allowed without a special exception for IPM Coordinator

INSECTICIDES (Landscapes)

Beetles, Caterpillars

- *Bacillus thuringiensis subspp. B.t. aizawai, B.t.kurstaki, B.t.tenebrionis* - liquid sprays*

Foliar Pests (Aphids, Scales, Mealybugs)

- Salts of Fatty Acids* (Insecticidal Soaps)
- Refined Oils* (Horticultural Oils)
- Spinosad 11.6% (Conserve® SC) - liquid spray for crawling insects

Ants

- Abamectin, Borax, Orthoboric Acid, Hydramethylnon, Hydropene, Indoxacarb, Methoprene, Pyriproxyfen, Spinosad - solid, liquid, granular and gel baits*

Caribbean Crazy Ants (CCAs): an emerging issue at several parks with potential to predate on native wildlife and damage utilities. Past efforts and reports statewide indicate this species is difficult to control.

Current CCA management strategy is as follows:

- Pressure washing of designated areas
- Sanitation (esp. pad/dumpster- scheduled routine)
- Baiting with boric acid (monitored/cleaned/re-charged)
- Use of "knock down" product(s) as last resort (need approval of product(s))

INSECTICIDES (Athletic Fields)

Fall armyworms, sod webworms

- Spinosad 11.6% (Conserve® SC) - liquid spray for crawling insects

Fire ants

- Indoxacarb 0.045% (Advion® or equivalent) - fire ant bait
- Hydramethylnon 0.73% (Amdro® or equivalent) - fire ant bait
- (S)-Methoprene 0.5% (Extinguish® or equivalent) - fire ant bait
- (S)-Methoprene 0.250% + Hydramethylnon 0.365% (Extinguish Plus® or equivalent)

Nematodes

- *Bacillus firmis* 5% (Nortica® or equivalent), reduced risk natural biocide for nematode reduction in athletic turf including lawn bowling and croquet greens

Mole crickets

Biological Control

- Nematodes, *Steinernema scapterisci* 27% (Nematac® S or equivalent), parasitic nematode of adult mole crickets and last stage nymphs
- Larra wasps, *Larra analis*, ectoparasitoid of adult mole crickets and last stage nymphs

Chemical Control

- Indoxacarb 0.22% (Advion® or equivalent) - granular bait
- Imidacloprid 75% (Merit® 75W or equivalent) - primary liquid systemic spray for newly hatched mole cricket nymphs
- Bifenthrin 7.9% (Talstarone™ Multi-Insecticide or equivalent)
- Fipronil 0.0142% - 0.1% (Chipco Choice or Top Choice) –when control has failed with IPM approved Imidacloprid products and Indoxacarb application protocols and it is necessary to stop infestation and avoid replacement of turf. Subsequent or back-to-back treatments with Fipronil are prohibited. Fipronil may also be used to stop mole cricket infestation on fields used as test plots for biological or cultural control test sites.

VERTEBRATE CONTROL Cultural methods (Le. preventative and exclusion methods) are preferred. See more in *IPM Procedures, Section 10*.

Mole Control

- Bromethalin 0.025% (Talpirid or equivalent) - bait

Rodent control

- Brodifacoum 0.005% - (Talon®, Havoc® or equivalent) - bait
- Anticoagulant rat control baits* in secure boxes - (Brodifacoum, Bromadiolone, Difethialone)

FUNGICIDES

- Methoxyacetyl amino Propionic Acid 22% (Subdue® Maxx or equivalent)
- Iprodione 23.3% (Lesco® 18 Plus or equivalent)-limited for Dollar spot at croquet and lawn bowling fields

HERBICIDES (Landscapes in Parks, Medians, Street Trees)

- Glyphosate 53.8% (Rodeo® or equivalent) - nonselective control
- Oryzalin 40.4% (Surflan® AS or equivalent) - pre-emergent
- 2-Phenethyl Propionate 21.4%, Eugenol 21.4% (EcoEXEMPT® HC) - nonselective burndown
- Fluazifop-butyl 24.5% (Fusilade® II or equivalent) - grass control in broad leaf beds

HERBICIDES (Ditches, Rights-of-way, Roadsides)

Annual and Perennial weeds

- Glyphosate 53.8% (Rodeo® or equivalent) - roadside curbs and sidewalks
- Sulfometuron methyl 75% (Oust® XP or equivalent) - weeds in bullheads and medians

HERBICIDES (Athletic Fields, Non-Desirable Species in Athletic Turf Grass)

Nonselective weed control

- Glyphosate 53.8% (Rodeo® or equivalent) - nonselective control
- 2- Phenethyl Propionate 21.4%, Eugenol 21.4% (EcoEXEMPT® HC) - nonselective burn down

Nonselective weed control in turf

- Prodiamine 40.7% (Barricade® 4FL or equivalent) - pre-emergent
- Imazaquin 70% (Image® 70 OG or equivalent)
- Metasulfuron 60% (Manor® or equivalent - spot treatment)
- Foramsulfuron 2.34% (Revolver™ or equivalent) - spot treatment
- Metribuzin 75% (Sencor® 75 or equivalent)

Broadleaf weed control

- Carfentrazone-ethyl 0.54%, 2, 4-D 10.49%, Mecoprop 2.66%, Dicamba 0.67% (Speed Zone® Southern or equivalent)

- Carfentrazone-ethyl 0.62%, 2,4-D 0.28%, Mecoprop 5.88%, Dicamba 1.71 % (Speed Zone® or equivalent)

Yellow and purple nutsedge

- Halosulfuron 75% (SedgeHammer™ or equivalent)

HERBICIDES (Canals, Storm water Ponds, and Aquatic Natural Areas)

Algae

- Copper 8.0% (K-Tea™ or equivalent) - algae control

Aquatic Weeds: Submerged

- Dipotassium Salt of Endothal 40.3% (Aquathol® K or equivalent), short-term pretreatment before planting

- Flouridone 5.0% (Sonar™ PR, Sonar™ Q, Sonar™ SPR or equivalent) - long-term

hydrilla and other submerged weed species control

- Flouridone 41.7% (Sonar™ AS or equivalent) - long-term hydrilla control

Aquatic Weeds: Emerged

- Glyphosate 53.8% (Rodeo® or equivalent) - nonselective, emergent aquatic weed control

- Imazapyr 28.7% (Habitat® or equivalent) - nonselective, emergent aquatic weed control for problematic species in monocultures

- Diquat Dibromide 37.3% (Reward® or equivalent) - contact, aquatic weed control

Broadleaf Aquatic Vegetation

- 2, 4-D 0.46.8% (Weedar® 64 or equivalent) - woody vegetation and water hyacinth control

- 2, 4-D 0.47.3% (Platoon™ or equivalent) - woody vegetation and water hyacinth control

HERBICIDES (Natural Areas, Upland Parks)

Melaleuca, Brazilian Pepper, and other woody invasive species

- Glyphosate 53.8% (Rodeo® or equivalent) - nonselective control in upland areas or associated with wetlands or aquatic areas

- Imazapyr 28.7% (Habitat® or equivalent) - Melaleuca or other exotics associated with wetlands or aquatic areas

C Whenever possible the use of Glyphosate is preferred

d Whenever possible the use of Glyphosate is preferred but Imazapyr may be used for difficult species like parrot feather, torpedo grass, and other exotics with extensive rhizomes

e Whenever possible the use of Glyphosate is preferred • Imazapyr 28.7% (Arsenal® or equivalent) - cut stump treatment of melaleuca and other exotics

- Triclopyr 60.45% (Garlon® 4 Ultra† or equivalent) - cut stump and basal bark control of Brazilian peppers and other exotics

- Triclopyr 13.6% (Pathfinder® II or equivalent), ready to use cut-stump/basal bark for Brazilian Peppers and other exotics

Invasive grasses, vines, and other herbaceous species

- Glyphosate 53.8% (Rodeo® or equivalent) - nonselective control in upland areas or associated with wetlands or aquatic areas

- Imazapyr 28.7% (Arsenal® or equivalent) - upland areas
 - Imazapyr 28.7% (Habitat® or equivalent) - in areas or associated with wetlands or aquatic areas
- † Garlon 4® Ultra replaces Garlon 4® which may be used while available

Request for Approval of a Pest Management Product
IPM Form 2008-1

APPENDIX B: FORM FOR ADDITION OF A PEST MANAGEMENT PRODUCT

Requesting Activity Business center

Point of Contact Title

Telephone Fax Email

Product information¹

Generic Name Trade Name

Class² Formulation³

Ready to use? Yes No Active ingredient (%)

Target Pest And Proposed Sites(s) of use

(Attach additional sheet if needed)

Justification

(Attach additional sheet if needed)

Requester

Signature Date

IPM coordinator action: Approved Disapprove

Signature Date

¹ Provide product label and MSDS with form to County IPM Coordinator

² Example: Organophosphate; Pyrethroid, IGR, etc.

³ Example: Granular; Aerosol; Emulsifiable Concentrate