

DETECTION, TRAPPING, AND MONITORING PROTOCOLS FOR SOUTH AMERICAN PALM WEEVIL (SAPW)



Compiled by
Cooperative Extension Program San Diego (UCCE SD)
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All photos courtesy of Mark Hoddle and the Center for Invasive Species Research (CISR) at UC Riverside, unless otherwise attributed.

II. BACKGROUND

The South American palm weevil (SAPW), known to scientists as *Rhynchophorus palmarum*, is an invasive beetle that has been detected infesting palm trees in San Diego County. The beetle inflicts serious physical damage to the fronds, crown, and hearts of palm trees, as well as weakening palms' immune system to leave them susceptible to other fungal and wilt diseases. An untreated palm infested by palm weevils will ultimately die, while serving as a nesting site to spread the beetle to other palms in the area.

Palm species most at risk of damage by the SAPW include the Canary Islands date palm and edible date palms, both of which are central crops in the \$140 million date and ornamental palm industry in southern California. Fast detection and removal of SAPW infestations is key, because even moderately infested palms act as nurseries for weevil larvae and help spread damage.

III. OBJECTIVE

The objective of this protocol is to help tree professionals, nursery professionals, and members of the general public detect SAPW infestations for rapid intervention. For information on palm weevil lookalikes, how to tell which palm trees are at risk, tree treatment and removal, and other general facts, please refer to UCCE San Diego's SAPW tip sheets. Other resources and contacts are included in section IX of this document, "Contacts, Resources, and Reporting," on page 10.

IV. SETUP

Setup goals

Two types of traps can be used to monitor the presence of SAPW: Picusan® traps, which are commercial traps designed to monitor palm weevil infestations, and homemade traps using 2-gallon plastic buckets (Fig. 1). Both traps have several important features: (1) rotting fruit accelerated with water and commercial yeast, which acts as a lure and synergizes the attractiveness of (2) the commercially-available aggregation pheromone, which attracts beetles to a food source, in combination with ethyl acetate (another volatile attractant); and (3) a killing agent, usually propylene glycol and water that is in the trap and drowns weevils.

Traps cannot be used as weevil control because they do not trap weevils with 100% effectiveness. They serve to monitor weevil populations and assess risk to palms, not as eradication devices. If your traps indicate a local palm infested with SAPW or nearby weevil activity, further action is required, including insecticide treatment and/or palm removal.

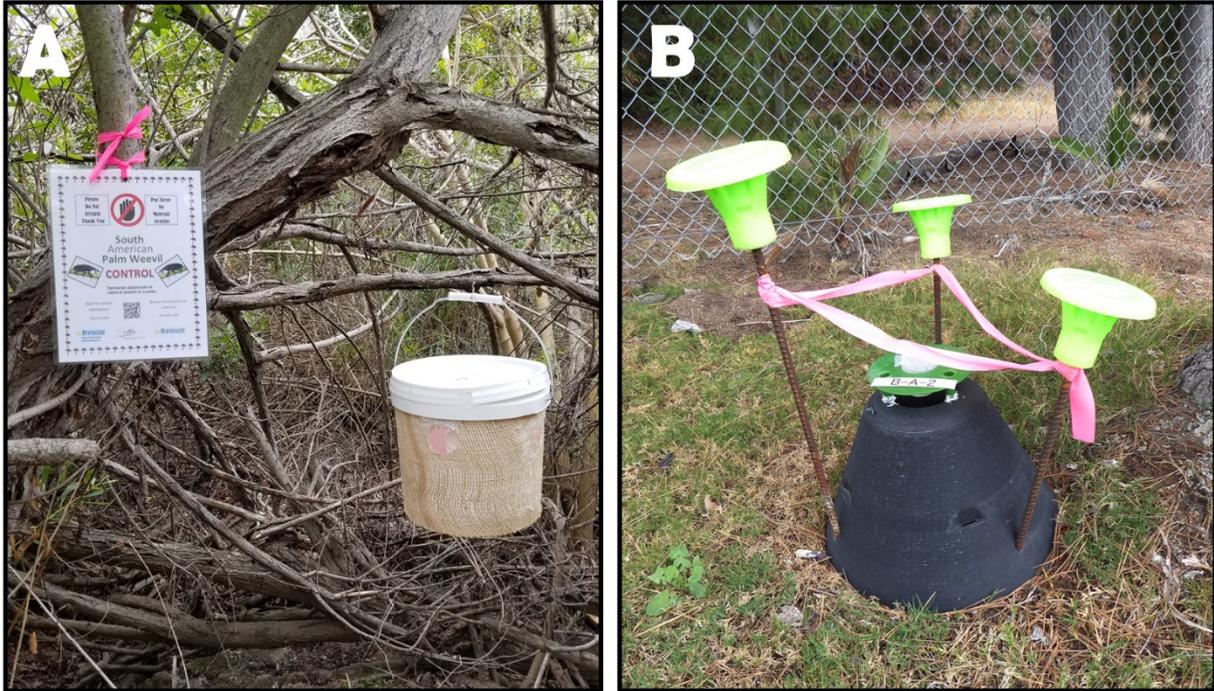


Figure 1. (A) A homemade bucket trap deployed in a tree. (B) A Picusan® trap deployed on the ground. Note: in both images, flagging tape warns passersby not to disturb the traps.

Trap placement

Place traps a minimum of 150 meters away from the palms you wish to monitor. If traps are placed any closer to palms, the aggregation pheromone used as an attractant may attract beetles from far away that can infest a healthy tree. Do not hang traps on palms.

If you are monitoring an area, install multiple traps far away from palms. This allows traps to attract beetles and lowers the likelihood that they will find and attack nearby palms.

Placement of traps in the shade is recommended, because the interior of plastic traps can reach high temperatures in the sun, which reduces their effectiveness.

Trap installation

Bucket traps can be placed on the ground or suspended from a pole or tree. Picusan® traps can be placed on the ground. If raccoons or rats are an issue at your site, suspend the bucket trap at least 1 meter above the ground from a pole or branch with wire. Picusan traps can be secured to the ground with 0.5 inch diameter 12” lengths of rebar (you will have to drill holes into the black exterior of the Picusan trap to do so – remove the white interior collecting pan before drilling holes). Intensive surveying protocol

consists of 25 traps per square mile deployed in an even pattern, supplemented by examining every palm in the area for pupal cases and frond damage.

V. MONITORING

Monitoring goals

The goal of SAPW monitoring is to evaluate the spread of the weevil, learn what palm species and geographic areas are at risk, and take prophylactic action to protect palms when weevils are detected in an area with vulnerable palm species.

When you install traps and collect samples, label each trap and each sample collected with information about the collection:

- Site location (e.g., name of neighborhood, park, wilderness area, or tribal property)
- Trap number or name that corresponds to an individual trap's location (e.g., "trap 4 of 5" if you have installed 5 traps)
- GPS coordinates of the trap site
- Date of collection
- Name of collector and/or trap installer

Monitoring materials

Listed below are the materials required to make a homemade bucket trap. For links to order specific products, or for the site on which to order a Picusan® trap, see section IX of this document, "Contacts, Resources, and Reporting."

- 2-gallon paint bucket with lid: To construct the trap
- Aggregation pheromone (rhynchophorol – commercially available from ISCATech in Riverside CA): To attract weevils
- Ethyl acetate: Acts as a synergist to increase the effect of the aggregation pheromone and the fermenting bait
- Chopped dates, pineapple, or sugarcane residue: Acts as food bait when it starts fermenting. The food bait must be mixed with water to add fermentation.
- Commercial baker's yeast: Accelerates fermentation of food bait
- Burlap fabric: Gives weevils a foothold to climb the bucket and fall into the trap
- Small plastic containers, e.g. yogurt pots or tupperwares, with perforated lids: Keeps the food bait separate from the propylene glycol to allow easier replacement. (If rats/pests are an issue, plastic containers can be substituted for glass mason jars with holes punched into the metal lid to eliminate feeding by rats)
- Metal mesh: Covers the holes cut in the plastic container lids to keep weevils out of the food bait but still allows the odor of the fermenting bait to escape.
- Water: Add to the food bait to accelerate fermentation, and add to the bucket to dilute the propylene glycol to 50%

- Propylene glycol: Killing agent in bottom of bucket trap that drowns and preserves weevils

Sample collection in the field

Take the trap down, open it, and count the number of SAPW present in the trap (there will be some bycatch of fig beetles, moths, etc. attracted to the rotting fruit). Record the data on the monitoring sheet as described above. Refill the trap if needed with a mixture of 50% propylene glycol and 50% water.

Traps should be inspected, insects collected, and food baits replaced every 2 weeks. Aggregation pheromone and ethyl acetate should be replaced every 4 to 6 weeks.

Sample identification



Figure 2. (A) South American palm weevil life stages, from left to right: Adult weevil, larva (grub), palm frond cocoon, and pupa. (B) Adult SAPW next to a U.S. quarter (top right) and penny (bottom right). Adult males have bristles on the top of the rostrum or “nose,” while females have a smooth “nose.”

For more information on identifying SAPW, please refer to UCCE SD’s tip sheets for SAPW identification and management.

Sample delivery

Send samples to Mark Hoddle (see section IX of this document, “Contacts, Resources, and Reporting”). Samples be frozen if DNA barcoding will be performed; if DNA barcoding is desired, place specimens in a freezer and use ice packs when shipping.

Replacing lures

Aggregation pheromone loses its effectiveness over time, so both the pheromone and the ethyl acetate synergist should be replaced after 4 to 6 weeks. When traps are taken down every 2 weeks to inspect for insects, check the quality of the propylene glycol and the state of the food baits. Note: Lure efficacy can be affected by extreme weather conditions. Top up the ethyl acetate and propylene glycol if needed. A paint strainer or something similar can be used to collect and sieve leaves, twigs, flies, moths, etc., from the propylene glycol.

VI. INFORMATION ON TRAP MATERIALS

Rhynchophorol (6-Methyl-2E-hepten-4-ol):

Rhynchophorol is the chemical name of the palm weevil aggregation pheromone, which is produced by males. When the pheromone disperses in the air, it alerts South American palm weevils that there is a good resource nearby and facilitates attraction by males and females to palm trees.

Propylene glycol (propane-1,2-diol):

Propylene glycol is an alcohol-based antifreeze chemical that is often used as a replacement for ethylene glycol in “eco-friendly” antifreeze. It acts as a preservative for DNA in pitfall traps, and is preferable to ethanol for this purpose because it evaporates less rapidly.

Ethyl acetate (EtOAc):

Ethyl acetate is a chemical solvent often used in glue and nail polish remover. It is preferred over other solvents because of its relatively low cost, toxicity, and lack of strong smell.

For complete material information, see the appendices which contain the Material Safety Data Sheets on page 15.

This trap is part of a joint research and detection program for the South American palm weevil. The beetle is an invasive pest and poses a significant threat to Southern California's native and landscaped palms.

**INSECT TRAP
PLEASE DO NOT
DISTURB**

**TRAMPA DE INSECTOS
POR FAVOR
NO MOLESTAR**

Please report damage to this trap to:



VIII. TRAPPING ALTERNATIVES

In a commercial growing operation, or in natural areas such as county parks, bucket or ground trapping may not be the most effective monitoring tool. Unmanned Aircraft Systems (UAS), also called drones, are often used in farming operations to do scouting when it is too labor-intensive or difficult for people to do.

Drone data can be used to scout crops more systematically and more often. The images collected can be used to detect early signs of crown damage, yellowing foliage, or count tree mortality. This plant stress monitoring can provide commercial palm tree or date growers with fast, accurate, aerial views of overall palm tree health.

UAS technology and regulations are constantly changing. After determining your personal goals for using drone technology, research which type of drone would be the most appropriate to reach your goals.

Drones must be registered and follow rules set forth by the FAA. For more information, see the Unmanned Aircraft Systems “Getting Started” page here:

https://www.faa.gov/uas/getting_started/

IX. CONTACTS, RESOURCES, AND REPORTING

SAPW handouts and factsheets (to download):

<https://ucanr.edu/sites/SAPW/>

General information on palm trees and their insect pests:

<http://ipm.ucanr.edu/PMG/GARDEN/PLANTS/palm.html>

Common palm diseases in California, and distinguishing them from SAPW infestations:

<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74148.html>

Detailed summary of SAPW facts, life history, and potential damage:

<https://biocontrol.ucr.edu/pdfs/usda-palmarum-fact-sheet.pdf>

Detailed directions to diagnose, monitor, and trap SAPW and treat or remove palms:

https://biocontrol.ucr.edu/south_american_palm_weevil.html

Informational and Reporting Contacts

Report infested palms at https://civr.ucr.edu/palmarum_survey.html

Center for Invasive Species Research, University of California Riverside

Report infestations to Mark Hoddle, Director

Mark.hoddle@ucr.edu

(951) 827-4714

UC Cooperative Extension, San Diego County (UCCE SD)

Kearny Mesa Office:
9335 Hazard Way, Suite 201
San Diego, CA 92123
(858) 822-7711

North County Office:
420 S Broadway, Suite 202
Escondido, CA 92025
(858) 221-2082

Jan Gonzales, Program Coordinator
jgonzales@ucanr.edu
(858) 822-7718
Leah Taylor, Staff Research Associate
leataylor@ucanr.edu

USDA Forest Service: Forest Health Protection
Stacy Hishinuma, Entomologist
shishinuma@fs.fed.us
(909) 382-2620

USDA APHIS/ARS: Animal and Plant Health Inspection Service
Dr. Amy Roda, Entomologist
amy.L.roda@aphis.usda.gov
(786) 573-7089

San Diego County Department of Agriculture, Weights, and Measures
Pest Detection Hotline (deals with invasive insect trapping)
(800)300-TRAP(8727)

Sample Testing

Contact Dr. Mark Hoddle (see above) or UCCE San Diego (see above) to test samples.

- Contact via email to make arrangements to deliver samples
- Possible future fees for testing suspect beetles

See photo example with instructions for submitting photos and taking a sample below

Step 1: Visit UC Riverside's Center for Invasive Species Research South American Palm weevil website, https://cistr.ucr.edu/palmarum_survey.html

Step 2: Click on "Click Here to Report Infested Palms" on the webpage. (Photo of link below)

[Click Here to Report Infested Palms](#)

Survey responses help southern California scientists collect data on this new pest and document its affects on local palms. [Report Infested Palms Here](#)



Step 3: Complete the survey questions and upload photos of suspect trees and weevils. Pictures that show various symptoms on the same suspect tree are encouraged.

South American Palm Weevil Survey

Survey responses help southern California scientists collect data on this new pest and document its affects on local palms.

Date Observed _____

Your Name _____

Your Email Address _____

Your Phone _____

Street Address of Infested Palm (Number and Street Name) _____

Date Observed _____

Your Name _____

Your Email Address _____

Your Phone _____

Street Address of Infested Palm (Number and Street Name) _____

City with Infested Palm _____

County with Infested Palm _____

GPS Longitude (i.e., West/East Reading - OPTIONAL) _____

GPS Latitude (i.e., North/South Reading - OPTIONAL) _____

Observation Notes _____

File Upload
 Select a file from your computer

I'm not a robot 

Ordering Trap Supplies

Propylene glycol (Amazon.com): \$25 for 1 gallon
<https://www.amazon.com/Propylene-Glycol-Food-Grade-Gallon/dp/B00GI2CIQS>

Ethyl acetate (Amazon.com): \$20 for 1 liter
https://www.amazon.com/MG-Chemicals-Ethyl-Acetate-Metal/dp/B06XRKPGD8?ref=fscip_pl_dp_1

2-gallon paint buckets (Home Depot): \$18 for 10 buckets
<https://www.homedepot.com/p/Argee-2-gal-White-Pail-RG502-10/204081114>

Lids for 2-gallon buckets (Home Depot): \$8 for 10 lids
<https://www.homedepot.com/p/Lid-for-2-gal-Pail-RG502L-10/204082810>

Burlap fabric (JoAnn): \$3 per yard
<https://www.joann.com/burlap-fabric/prd23682.html#start=1>

Picusan® traps (BioBest):
<https://www.biobestgroup.com/en/biobest/products/monitoring-and-scouting-4464/pheromone-traps-4494/picusan%C2%AE-trap-483>

X. APPENDICES:
How to assemble palm weevil bucket trap.

Palm Weevil Bucket Trap – Change Lures and Bait Every 4 Weeks

2 gallon paint bucket from Home Depot.
 Lids are sold separately
<http://www.homedepot.com/p/Argee-2-gal-White-Pail-RG502-10/204081114>

2 inch diameter hole cut with a hole saw that attaches to a drill. Available at Home Depot
<http://www.homedepot.com/p/Milwaukee-2-in-Hole-Dozer-Hole-Saw-with-Arbor-49-56-9667/202327737>

Burlap wrap to help weevils climb bucket to reach holes. Elmers glue will work for attaching burlap. Available in the garden section at Home Depot
<http://www.homedepot.com/p/Easy-Gardener-80-in-x-80-in-Natural-Burlap-Landscape-Fabric-3180/203204386>



Wire “hook” that passes through bucket lid from which the aggregation pheromone and ethyl acetate synergist is attached

Bottle with ethyl acetate (nail polish remover) and hanging behind this and out of view is the vial with the commercially available aggregation pheromone (<https://www.iscotech.com/>)

I place the “bait” inside a yoghurt pot. Lid is perforated to let fermentation odors out. Cover holes with insect screen to stop weevils entering bait container. For bait I’ve used cut pineapple chunks in a can or dates. I tip all of the pineapple contents into the pot. With dates (use ~ 15) or pineapple chunks fill pot ¾ full with water.

For preservative I use car antifreeze, but you can dilute down to 50% food grade polyethylene glycol. This depends on if you want specimens for DNA work. Alternatively, you can dump bait and water into the bucket trap and weevils will fall in drown and rot. The stink is strong!

Setting up Traps

Step ladder for climbing to branches to hang traps

Water for adding to bait. Add yeast to speed up bait fermentation

Yoghurt pots with perforated lids. Lids have screen mesh over holes to keep weevils out



Buckets ready to be loaded with pheromone/synergist and bait

Trap supplies in bags/back packs

Antifreeze preservative

Aggregation pheromone suspended from bucket lid

Deploy trap > 1 m above ground to keep vertebrates (e.g., raccoons) out of trap. Attach wire to bucket handle to tie onto branch to reduce risk of bucket drop/trap loss. If rats are a problem use wire to “dangle” trap ~18 inches below branch to make access difficult for rats. Hang traps in shady areas (bait/pheromone lasts longer), preferably away from palms (weevils may go to palm after being attracted to trap)



Bait in yoghurt pot lasts about 3-4 weeks in shade before it needs servicing. I check traps every 4 weeks and bait is sub-optimal by this time and some weevils may start to rot even in the antifreeze preservative

Sth American palm weevils in trap – You’ll get some by-catch; noctuid moths and fig beetles are attracted to fermenting bait



XI. MATERIAL SAFETY DATA SHEETS:



SAFETY DATA SHEET ETHYL ACETATE

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name	ETHYL ACETATE
Product number	642
Synonyms; trade names	ETHYL ACETATE 98 - 100%, ACETIC ACID ETHYL ESTER, ACETOXYETHANE, ETHYL ACETATE TRBG, YA 203 DIL NORMAL AE, ETHYL ACETATE PH 99.5% MIN, ETHYL ACETATE EP, ETHYL ACETATE STATOIL, ETHYL ACETATE
REACH registration number	01-2119475103-46-XXXX
CAS number	141-78-6
EU index number	607-022-00-5
EC number	205-500-4

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Industrial Solvent Industrial application Cosmetics For further information, see attached Exposure Scenario.
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1.3. Details of the supplier of the safety data sheet

Supplier	Univar Aquarius House 6 Mid Point Business Park Bradford BD3 7AY +44 1274 267300 +44 1274 267306 sds@univar.com
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1.4. Emergency telephone number

Emergency telephone	SGS - +32 (0)3 575 55 55 (24h)
Sds No.	642

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

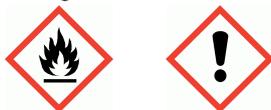
Physical hazards	Flam. Liq. 2 - H225
Health hazards	Eye Irrit. 2 - H319 STOT SE 3 - H336
Environmental hazards	Not Classified

2.2. Label elements

EC number	205-500-4
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ETHYL ACETATE

Pictogram



Signal word

Danger

Hazard statements

H225 Highly flammable liquid and vapour.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P261 Avoid breathing vapour/ spray.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P501 Dispose of contents/ container in accordance with national regulations.

Supplemental label information

EUH066 Repeated exposure may cause skin dryness or cracking.

2.3. Other hazards

This substance is not classified as PBT or vPvB according to current EU criteria.

SECTION 3: Composition/information on ingredients

3.1. Substances

Product name	ETHYL ACETATE
REACH registration number	01-2119475103-46-XXXX
EU index number	607-022-00-5
CAS number	141-78-6
EC number	205-500-4
Composition comments	The data shown are in accordance with the latest EC Directives.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Remove affected person from source of contamination. Get medical attention if any discomfort continues.
Ingestion	Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Rinse mouth thoroughly with water. Give plenty of water to drink. Get medical attention if any discomfort continues.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if any discomfort continues.
Eye contact	Rinse immediately with plenty of water. Remove any contact lenses and open eyelids wide apart. Continue to rinse for at least 15 minutes. Get medical attention immediately. Continue to rinse.

4.2. Most important symptoms and effects, both acute and delayed

ETHYL ACETATE

Inhalation	Central nervous system depression including narcotic effects such as drowsiness, narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.
Skin contact	Prolonged contact may cause redness, irritation and dry skin.
Eye contact	May cause temporary eye irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	No specific recommendations. If in doubt, get medical attention promptly.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards Oxides of the following substances: Carbon.

5.3. Advice for firefighters

Special protective equipment for firefighters Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions Follow precautions for safe handling described in this safety data sheet. Take precautionary measures against static discharges. Avoid inhalation of vapours and contact with skin and eyes.

6.2. Environmental precautions

Environmental precautions Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up Absorb spillage with inert, damp, non-combustible material. Flush contaminated area with plenty of water. Collect and place in suitable waste disposal containers and seal securely. For waste disposal, see Section 13.

6.4. Reference to other sections

Reference to other sections Wear protective clothing as described in Section 8 of this safety data sheet.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions Avoid spilling. Avoid contact with skin and eyes. Keep away from heat, sparks and open flame. Provide adequate ventilation.

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep away from heat, sparks and open flame.

Storage class Flammable liquid storage.

7.3. Specific end use(s)

ETHYL ACETATE

Specific end use(s) The identified uses for this product are detailed in Section 1.2.

SECTION 8: Exposure Controls/personal protection

8.1. Control parameters

Occupational exposure limits

Long-term exposure limit (8-hour TWA): WEL 200 ppm

Short-term exposure limit (15-minute): WEL 400 ppm

WEL = Workplace Exposure Limit

Ingredient comments

WEL = Workplace Exposure Limits

DNEL

Industry - Inhalation; Short term local effects: 1468 mg/m³

Industry - Inhalation; Short term systemic effects: 1468 mg/m³

Industry - Dermal; Long term systemic effects: 63 mg/kg/day

Industry - Inhalation; Long term local effects: 734 mg/m³

Industry - Inhalation; Long term systemic effects: 734 mg/m³

Consumer - Inhalation; Short term local effects: 734 mg/m³

Consumer - Inhalation; Short term systemic effects: 734 mg/m³

Consumer - Dermal; Long term systemic effects: 37 mg/kg/day

Consumer - Inhalation; Long term systemic effects: 367 mg/m³

Consumer - Inhalation; Long term local effects: 367 mg/m³

Consumer - Oral; Long term local effects: 4.5 mg/kg/day

PNEC

- Fresh water; 0.26 mg/l

- Marine water; 0.026 mg/l

- Sediment; 0.34 mg/kg

- Soil; 0.22 mg/kg

- STP; 650 mg/l

8.2. Exposure controls

Protective equipment



Eye/face protection

The following protection should be worn: Chemical splash goggles. EN 166

Hand protection

The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. Polyvinylchloride, Nitrile rubber, Neoprene, Butyl rubber (>0,7mm), Fluoroelastomer (>0,7mm). Breakthrough time for gloves >480 min. EN 374

Other skin and body protection

Wear rubber apron. Wear rubber footwear.

Respiratory protection

If ventilation is inadequate, suitable respiratory protection must be worn. Wear a respirator fitted with the following cartridge: Gas filter, type A2. EN 136/140/141/145/143/149

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Appearance

Liquid.

Colour

Colourless.

Odour

Fruity.

Odour threshold

No information available.

ETHYL ACETATE

pH	No information available.
Melting point	-83.8°C
Initial boiling point and range	76 - 77°C
Flash point	-4°C Closed cup.
Evaporation rate	4.5 (diethyl ether = 1)
Evaporation factor	No information available.
Flammability (solid, gas)	No information available.
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 2.2 % Upper flammable/explosive limit: 11.5 %
Other flammability	No information available.
Vapour pressure	No information available.
Vapour density	3.04
Relative density	0.899 - 0.903 @ 20°C
Bulk density	No information available.
Solubility(ies)	Soluble in water.
Partition coefficient	: 0.68
Auto-ignition temperature	427°C
Decomposition Temperature	No information available.
Viscosity	0.4508 mPa s @ 20°C
Explosive properties	No information available.
Explosive under the influence of a flame	No information available.
Oxidising properties	No information available.
<u>9.2. Other information</u>	
Refractive index	No information available.
Particle size	No information available.
Molecular weight	88.11
Volatility	No information available.
Saturation concentration	No information available.
Critical temperature	No information available.
Volatile organic compound	No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended.

ETHYL ACETATE

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Will not polymerise.

10.4. Conditions to avoid

Conditions to avoid Avoid excessive heat for prolonged periods of time. Avoid heat, flames and other sources of ignition.

10.5. Incompatible materials

Materials to avoid Strong oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Oxides of the following substances: Carbon.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 4,934.0

Species Rabbit

Notes (oral LD₅₀) OECD 401

Acute toxicity - dermal

Acute toxicity dermal (LD₅₀ mg/kg) 20,000.0

Species Rabbit

Notes (dermal LD₅₀) OECD 404

Skin corrosion/irritation

Animal data Not irritating.

Serious eye damage/irritation

Serious eye damage/irritation Irritating to eyes.

Respiratory sensitisation

Respiratory sensitisation Not sensitising.

Skin sensitisation

Skin sensitisation Not sensitising.

Germ cell mutagenicity

Genotoxicity - in vitro Negative.

Genotoxicity - in vivo Negative.

Carcinogenicity

Carcinogenicity No information available.

Reproductive toxicity

Reproductive toxicity - fertility No information available.

Specific target organ toxicity - single exposure

STOT - single exposure May cause drowsiness or dizziness.

ETHYL ACETATE

Specific target organ toxicity - repeated exposure

STOT - repeated exposure No information available.

Aspiration hazard

Aspiration hazard No information available.

Inhalation

Irritating to respiratory system. Vapours have a narcotic effect. Symptoms following overexposure may include the following: Headache. Fatigue. Dizziness. Nausea, vomiting.

Ingestion

May cause discomfort if swallowed. Narcotic effect.

Skin contact

Repeated exposure may cause skin dryness or cracking.

Eye contact

Slightly irritating.

SECTION 12: Ecological Information

Ecotoxicity

The product components are not classified as environmentally hazardous. However, large or frequent spills may have hazardous effects on the environment.

12.1. Toxicity

Acute aquatic toxicity

Acute toxicity - fish

LC50, 96 hours: 230 mg/l, Pimephales promelas (Fat-head Minnow)

Acute toxicity - aquatic invertebrates

EC₅₀, 48 hours: 560 mg/l, Daphnia magna

Acute toxicity - aquatic plants

EC₅₀, 96 hours: 2500 mg/l, Algae
NOEC, 48 hour: > 1000 mg/l, Algae

Chronic aquatic toxicity

Short term toxicity - embryo and sac fry stages

NOEC, 96 hour: 9.65 mg/l, Fish
OECD 212

Chronic toxicity - aquatic invertebrates

NOEC, 21 days: 2.4 mg/l, Daphnia magna

12.2. Persistence and degradability

Persistence and degradability The product is readily biodegradable.

Biodegradation

- Degradation 69%: 20 day

12.3. Bioaccumulative potential

Bioaccumulative potential No data available on bioaccumulation.

Partition coefficient

: 0.68

12.4. Mobility in soil

Mobility

The product is soluble in water.

Surface tension

24 mN/m @ 20°C

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment

This substance is not classified as PBT or vPvB according to current EU criteria.

12.6. Other adverse effects

Other adverse effects

Not determined.

ETHYL ACETATE

SECTION 13: Disposal considerations

13.1. Waste treatment methods

General information	Waste should be treated as controlled waste. Do not puncture or incinerate, even when empty.
Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

SECTION 14: Transport information

General Wear protective clothing as described in Section 8 of this safety data sheet.

14.1. UN number

UN No. (ADR/RID)	1173
UN No. (IMDG)	1173
UN No. (ICAO)	1173
UN No. (ADN)	1173

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	ETHYL ACETATE
Proper shipping name (IMDG)	ETHYL ACETATE
Proper shipping name (ICAO)	ETHYL ACETATE
Proper shipping name (ADN)	ETHYL ACETATE

14.3. Transport hazard class(es)

ADR/RID class	3
ADR/RID classification code	F1
ADR/RID label	3
IMDG class	3
ICAO class/division	3
ADN class	3

Transport labels



14.4. Packing group

ADR/RID packing group	II
IMDG packing group	II
ADN packing group	II
ICAO packing group	II

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
No.

ETHYL ACETATE

14.6. Special precautions for user

EmS	F-E, S-D
ADR transport category	2
Emergency Action Code	•3YE
Hazard Identification Number (ADR/RID)	33
Tunnel restriction code	(D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not determined.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation
Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).
Commission Regulation (EU) No 2015/830 of 28 May 2015.
This product may impact SEVESO storage regulations.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

Inventories

EU - EINECS/ELINCS

All the ingredients are listed or exempt.

US - TSCA

All the ingredients are listed or exempt.

Australia - AICS

All the ingredients are listed or exempt.

Korea - KECI

All the ingredients are listed or exempt.

China - IECSC

All the ingredients are listed or exempt.

Philippines – PICCS

All the ingredients are listed or exempt.

New Zealand - NZIOC

All the ingredients are listed or exempt.

SECTION 16: Other information

ETHYL ACETATE

Abbreviations and acronyms used in the safety data sheet

ATE: Acute Toxicity Estimate.
 ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.
 ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways.
 CAS: Chemical Abstracts Service.
 DNEL: Derived No Effect Level.
 IATA: International Air Transport Association.
 IMDG: International Maritime Dangerous Goods.
 Kow: Octanol-water partition coefficient.
 LC₅₀: Lethal Concentration to 50 % of a test population.
 LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose).
 PBT: Persistent, Bioaccumulative and Toxic substance.
 PNEC: Predicted No Effect Concentration.
 REACH: Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006.
 RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
 vPvB: Very Persistent and Very Bioaccumulative.
 IARC: International Agency for Research on Cancer.
 MARPOL 73/78: International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978.
 cATpE: Converted Acute Toxicity Point Estimate.
 BCF: Bioconcentration Factor.
 BOD: Biochemical Oxygen Demand.
 EC₅₀: 50% of maximal Effective Concentration.
 LOAEC: Lowest Observed Adverse Effect Concentration.
 LOAEL: Lowest Observed Adverse Effect Level.
 NOAEC: No Observed Adverse Effect Concentration.
 NOAEL: No Observed Adverse Effect Level.
 NOEC: No Observed Effect Concentration.
 LOEC: Lowest Observed Effect Concentration.
 DMEL: Derived Minimal Effect Level.
 EL50: Exposure Limit 50
 hPa: Hectopascal
 LL50: Lethal Loading fifty
 OECD: Organisation for Economic Co-operation and Development
 POW: Octanol-water partition coefficient
 SCBA: self-contained breathing apparatus
 STP: Sewage Treatment Plant
 VOC: Volatile Organic Compounds

Classification abbreviations and acronyms

Acute Tox. = Acute toxicity
 Aquatic Acute = Hazardous to the aquatic environment (acute)
 Aquatic Chronic = Hazardous to the aquatic environment (chronic)

Key literature references and sources for data

Supplier's information.

Revision comments

NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date

05/01/2018

Version number

3.000

Supersedes date

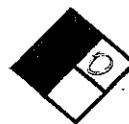
31/03/2017

SDS number

642

ETHYL ACETATE

SDS status	Approved.
Hazard statements in full	H225 Highly flammable liquid and vapour. H319 Causes serious eye irritation. H336 May cause drowsiness or dizziness.
Signature	Lisa Bland



Material Safety Data Sheet

April 2003

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product: Propylene Glycol

2. COMPOSITION/INFORMATION ON INGREDIENTS

Propylene glycol	CAS# 000057-55-6	95%
Dipotassium phosphate	CAS# 007758-11-4	<5%
Deionized Water	CAS# 007732-15-5	<5%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Green, odorless liquid. Toxic fumes released in fire situations.

POTENTIAL HEALTH EFFECTS (See Section II for toxicological data.)

EYE: May cause slight transient eye irritation. Corneal injury is unlikely.

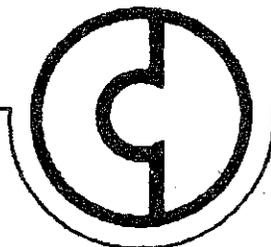
SKIN: Essentially nonirritating to skin on prolonged contact. A single prolonged skin exposure is not likely to result in the material being absorbed through skin in harmful amounts. Repeated exposures may cause slight flaking, tenderness and softening of skin.

INGESTION: Single dose oral toxicity is low. No hazards anticipated from swallowing small amounts incidental to normal handling operations.

INHALATION: A single prolonged (hours) inhalation exposure is not likely to cause adverse effects. Mists are not likely to be hazardous.

SYSTEMIC (OTHER TARGET ORGAN) EFFECTS: Repeated excessive ingestion may cause central nervous effects.

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CANCER INFORMATION: Did not cause cancer in long-term animal studies.

TERATOLOGY (BIRTH DEFECTS): Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus.

REPRODUCTIVE EFFECTS: In animal studies, has been shown not to interfere with reproduction.

4. FIRST AID

EYE: Flush eyes with plenty of water.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5. FIRE FIGHTING MEASURES

FLASH POINT: 215F, 102C

METHOD USED: TOC (Tag Open Cup)

FLAMMABLE LIMITS:

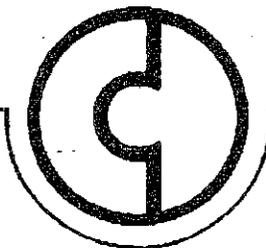
LFL: 2.6% @ 100C

UFL: 12.5% @ 130C

HAZARDOUS COMBUSTION PRODUCTS: During a fire, smoke may contain the original material in addition to unidentified toxic and/or irritating compounds. Hazardous combustion products may include and are not limited to carbon monoxide and carbon dioxide.

OTHER FLAMMABILITY INFORMATION: Violent steam generation or eruption may occur upon applications of direct water stream. Flammable concentration of vapor can accumulate at temperatures above 215.0 deg. F. Liquid mist of this product can burn.

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Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

EXTINGUISHING MEDIA: Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General-purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream. Will spread fire.

MEDIA TO BE AVOIDED: Do not use direct water stream.

FIRE FIGHTING INSTRUCTIONS: Keep people away. Isolate fire area and deny unnecessary entry. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire.

PROTECTIVE EQUIPMENT FOR FIRE FIGHTERS: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire-fighting clothing (including fire-fighting helmet, coat, pants, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES (See Section 15 for Regulatory Information)

PROTECT PEOPLE: Clear non-emergency personnel from area.

PROTECT THE ENVIRONMENT: Contain liquid to prevent contamination of soil, surface water or ground water.

CLEANUP: Clean up with absorbent material. Sweep up.

7. HANDLING AND STORAGE

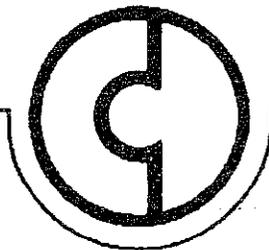
HANDLING: Product on surfaces can cause slippery conditions.

STORAGE: Store below 121C, 250F

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Good general ventilation should be sufficient for most conditions.

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PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: Use safety glasses

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Use impervious gloves when prolonged or frequently repeated contact could occur.

RESPIRATORY PROTECTION: No respiratory protection should be needed.

EXPOSURE GUIDELINE (S): Propylene glycol: AIHA WEEL is 50 ppm total, 10 mg/m³ aerosol only.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Green.

ODOR: Odorless liquid.

VAPOR PRESSURE: 0.22 mmHg @ 20C, 68F

VAPOR DENSITY: 2.62

BOILING POINT: 370F, 188C

SOLUBILITY IN WATER: Complete

SPECIFIC GRAVITY: 1.050 @60/60F, 16C

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Thermally stable at typical use temperatures.

CONDITIONS TO AVOID: Avoid temperatures above 121C/250F. Product can decompose at elevated temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS: Avoid contact with oxidizing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Hazardous decomposition products depend upon temperature, air supply and the presence of other materials.

HAZARDOUS POLYMERIZATION: Will not occur.

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11. TOXICOLOGICAL INFORMATION (See Section 3 for Potential Health Effects)

SKIN: The LD50 for skin absorption in rabbits is greater than 10,000 mg/kg.

INGESTION: The oral LD50 for female rats is about 20.3 g/kg.

MUTAGENICITY (EFFECTS ON GENETIC MATERIAL): Results of in vitro (test tube) mutagenicity tests have been negative. Results of mutagenicity tests in animals have been negative.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE

MOVEMENT AND PARTITIONING: Based largely or completely on data for major component(s). Bioconcentration potential is low (BCF less than 100 or Log Pow less than 3).

DEGRADATION AND PERSISTENCE: Based largely or completely on data from major component(s). Biodegradation under aerobic static laboratory conditions is high (BOD20 or BOD28/ThOD greater than 40%).

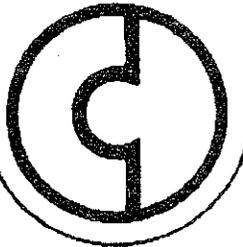
ECOTOXICITY: Based largely or completely on data from major component(s). Material is practically non-toxic to aquatic organisms on an acute basis (LC50 greater than 100 mg/l in most sensitive species).

13. DISPOSAL CONSIDERATIONS (See Section 15 for Regulatory Information):

Disposal: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND OR INTO ANY BODY OF WATER. All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

FOR UNUSED AND UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, or waste water treatment system.

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14. REGULATORY INFORMATION

U.S. REGULATIONS

SARA 13 INFORMATION: To the best of our knowledge, this product contains no chemical subject to SARA Title III Section 313 supplier notification requirements.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Not to have met any hazard category

TOXIC SUBSTANCES CONTROL ACT (TSCA):

All ingredients are on the TSCA inventory or are not required to be listed in the TSCA inventory.

STATE RIGHT-TO-KNOW: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

CHEMICAL NAME	CAS NUMBER	LIST
1,2-Propanediol	000057-55-6	PA1

PA1 = Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%)

DISCLAIMER OF LIABILITY

The information in this MSDS was obtained from sources we believe are reliable. HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, REGARDING ITS ACCURACY OR CORRECTNESS. The conditions or method of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY DIRECTLY OR INDIRECTLY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE USE OR DISPOSAL OF THE PRODUCT OR THE INFORMATION FURNISHED THEREWITH.

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Safety Data Sheet

According to Federal Register / Vol. 77, No. 58 / March 26, 2012 / Rules and Regulations

Section 1: Identification

Product Name: ISCALure-Palmarum

Product Code: IT192

Recommended Use: Insect attraction for the purpose of monitoring South American Palm weevil, *Rhynchophorus palmarum*

Manufacturer:

ISCA TECHNOLOGIES, Inc.
1230 Spring Street
Riverside, CA 92507
www.iscatech.com

Contact Phone Number: 951 686 5008

Section 2: Hazard Identification

GHS-US classification and Hazard Statement:

H316 - Causes mild skin irritation
H320 - Causes eye irritation
H333 - May be harmful if inhaled

Hazard Pictograms:



GHS07

Precautionary Statements:

P102 - Keep out of reach of children
P103 - Read label before use
P270 - Do not eat, drink or smoke when using this product
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 - If eye irritation persists: Get medical advice/attention
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P235 - Keep cool
P501 - Dispose of contents/container according to local, regional, national, and international regulations

SECTION 3: Composition/information on ingredients

Name	CAS #	Molecular Mass	Molecular Formula	Chemical Name	GHS-US Classification
(E)-6-Methyl-2-hepten-4-ol	4798-62-3	128.21	C ₈ H ₁₆ O	(E)-6-Methyl-2-hepten-4-ol	H227, H316, H320, H335
Mixture of wax and oils	Not applicable	Not applicable	Not applicable	Not applicable	H305, H316, H320, H333

SECTION 4: First aid measures

Inhalation: Move victim to fresh air and keep comfortable for breathing

Skin: Flush skin with running water for at least 10 minutes. Wash skin with soap and water. If skin irritation occurs: Get medical advice/attention

Eye: Rinse with water for several minutes. Remove contact lenses, if present and continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion: Call poison control center or doctor immediately for treatment advice. Wash mouth with plenty of water. Seek medical advice.

Notes to Physician: All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

SECTION 5: Firefighting measures

Suitable Extinguishing Media: CO₂, Foam or dry chemical.

Potential hazardous products of combustion: Carbon dioxide, carbon monoxide, smoke, fumes, unburned hydrocarbons, and other products of combustion.

Special Fire Fighting Procedures: None; Use standard firefighting procedures.

SECTION 6: Accidental release measures

Personal Precautions: Avoid contact with skin when cleaning up spills. Wear gloves, long-sleeved shirt and long pants

Environmental precautions: The material should be prevented from contaminating soil or from entering sewage and drainage systems. If released accidentally, collect the product and place inside a plastic bag. Label the bag as hazardous waste and dispose it in accordance with local, state and federal laws and regulations.

Methods and material for containment and cleaning up: Use water and soap or citrus detergent.

Section 7: Handling and Storage

Storage: Store product sealed and refrigerated, if possible. If refrigerated, do not store with food. If refrigeration is not available, store product in a cool dry place, out of direct sunlight. Do not exceed 75°F for long-term storage.

Incompatible materials: Keep away from heat, oxidizers and strong acids.

SECTION 8: Exposure controls/personal protection

Personal Protective Equipment: Applicators and other handlers must wear long-sleeved shirt and long pants, waterproof gloves, and shoes plus socks. Follow the manufacturer's instructions for cleaning maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Safety goggles are recommended

General Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco

Section 9 - Physical and Chemical Properties

Physical State: Solid

Boiling Point: Data not available

Density: 1.15g/mL

Odor: Rubbery, waxy.

Melting Point: Data not available

Flash Point: Data not available

Color: light yellow

Solubility: Not soluble in water

pH: Not applicable.

Section 10: Stability and Reactivity

Reactivity: No dangerous reaction known under conditions of normal use.

Chemical stability: Stable under normal temperatures and pressures.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

Conditions to avoid: High temperatures, sparks, open flames and live electrical circuits.

Incompatible materials: Oxidizing agents, strong acids.

Hazardous decomposition products: In case of fire oxides of carbon, fumes or vapors, soot and smoke may be produced.

Section 11 - Toxicological Information

ISCALure-Palmarum (mixture of active ingredient + inerts): Toxicological properties of this product have not been thoroughly investigated.

Section 12 - Ecological Information

Data Not available.

Prevent contamination of soil, ground and surface water.

Section 13 - Disposal Considerations

Contact a licensed professional waste disposal service to dispose of this material. This material may be burned in a chemical incinerator equipped with an afterburner and scrubber or disposed in a sanitary landfill in accordance with local, state, and federal regulations. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

Transport in accordance with local, state and federal regulations.

Section 15 - Regulatory Information

US Classification and label Text: Indication of Danger: Irritant. Safety Statements: Keep away from heat – no smoking.
United States Regulatory information: SARA Listed: No

Section 16 - Other Information

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstance of use. Isca Technologies, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product. Furthermore, Isca Technologies, Inc. assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer as described in Section 1.