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Sysco SUSTAINABLE/INTEGRATED PEST MANAGEMENT INITIATIVE

Improving Stewardship in Canned and Frozen Fruit and Vegetable Production

Sysco Sustainable/IPM Glossary and Resources v09.01

September 24, 2014

Prepared for Sysco by:

The IPM Institute of North America, Inc.
1020 Regent St.
Madison WI 53715
(608) 232-1410, Fax (608) 232-1440
ipmworks@ipminstitute.org; www.ipminstitute.org

GLOSSARY

Action Threshold - A conservative estimate that reliably predicts when to take action against a pest to prevent economic losses. Economic losses occur when the value of the loss exceeds the cost of control. In other words, don't act against a pest if the action is more expensive than leaving the pest alone. Action thresholds should be science-based, such as those using systematic sampling, trap counts, weather conditions favorable to pests, regional Extension alerts and/or site-specific conditions such as proximity to pest over-wintering sites or alternate hosts.

Biofuel – A type of energy derived from renewable plant and animal materials. Examples of biofuels include ethanol, biodiesel and biogas (methane).

> Biofuels and Sustainability
> Current US policy promotes the production and use of biofuels from specific sources. EPA's 2010 Renewable Fuel Standards Program Regulatory Impact Analysis evaluated lifecycle greenhouse gas emissions (GHG) associated with a number of biofuels including corn ethanol, sugarcane ethanol, soybean biodiesel, and cellulosic biofuels (from switchgrass, corn stover). This analysis found that, on average, these biofuels result in greenhouse gas reductions when compared to conventional gasoline and diesel:
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> - Corn ethanol: 21% reduction in GHG emissions compared to gasoline
> - Sugarcane ethanol: 61% reduction in GHG emissions compared to gasoline
> - Soybean biodiesel: 57% reduction in GHG emissions compared to diesel fuel
> - Cellulosic biofuels: 110% reduction in GHG emissions compared to gasoline
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> However, in 2012 the EPA published data revealing that biofuels made from palm oil are not considered sustainable alternatives due to their low reductions in GHG emissions when compared to petroleum based fuels.
>
> Another issue associated with biofuels relates to net energy gain, especially in the production of corn ethanol. Although many studies report contradicting energy balance estimates when analyzing corn ethanol production, a 2006 study by the Energy and Resources Group at UC Berkeley University of California Berkeley analyzed six high profile studies on corn ethanol and concluded that producing ethanol from corn uses marginally less petroleum than producing gasoline.

Biosolids - Residues from treatment of domestic sanitary sewage. Biosolids are treated to reduce pathogens and attractiveness to pests such as flies, mosquitoes or rodents.

Drift management plan – Document designed to help applicator determine when wind direction or speed, precipitation or other weather conditions make it unsuitable to for certain types of pesticide applications; help the applicator select appropriate formulations, spray additives, equipment, application techniques and other mechanisms to minimize potential drift. The plan also provides names, addresses and phone numbers of residents in the affected area who need to be notified prior to a pesticide application when drift is a

possibility (informed consent), or who need to be notified that an unexpected drift may have occurred. See http://www.p2000.umich.edu/pest/p3.htm for additional information.

Ecologically sensitive areas - Locations that are highly susceptible to environmental damage or contain critical habitat for endangered or threatened species.

Environmental emergency – An unplanned, uncontrolled or accidental release of a substance with potential for harmful impacts on the environment, such as a fuel or chemical spill, or the potential for such an event to occur.

Environmental emergency management plan – Document outlining procedures to minimize the environmental impacts in the event of accidental release of fuel, pesticides, nutrients or other contaminants into the environment. Plan should include potential emergencies, emergency contacts, staff roles and responsibilities, resources available to control, contain and cleanup and where these are located and training protocols for staff.

Genetically modified organism (GMO) – A plant, animal, microorganism or cell which has had its genetic material altered by methods other than natural mating and reproduction or natural recombination. Genetic modification includes recombinant DNA, cell fusion, micro and macro injection, encapsulation, gene deletion and doubling.

Managed pollinators – Managed pollinators are species, often honey bees (*Apis mellifera)*, which are commercially rented and transported to and from a site of agricultural production to pollinate crops.

Micronutrients – Those nutrients needed in small amounts by plants such as boron, calcium, chlorine, copper, iron, manganese, molybdenum, zinc and others.

Pesticide drift – Physical movement of pesticide droplets or particles through the air at the time of pesticide application or soon thereafter from the target site to any non- or off -target site. Drift does not include pesticide movement to non- or off-target sites caused by erosion, migration, volatility or windblown soil particles that occurs after application, unless specifically listed on the product label with respect to drift control requirements.

Pesticide toxicity – Degree of potential for a specific pesticide to cause harm to health or environment. A central tenet of IPM is to use effective, least-toxic options when pesticide use is necessary. Pesticides (both EPA-registered or exempt products) vary greatly in toxicity. Toxicity signal words are printed on the pesticide label; “Caution” indicates relatively low toxicity, followed by “Warning” and “Danger”. Pesticide users should be able to demonstrate that they have a rational system in place for identifying least-toxic options.

Criteria that can be used for ranking pesticides for toxicity include:

- acute toxicity to mammals;
- chronic toxicity, indicated by the presence of active ingredients identified as
- possible, likely, probable or known carcinogens, reproductive or developmental
- toxins by the US EPA, the International Agency for Research on Cancer, the state of California or other recognized authority;
- nervous system toxins such as cholinesterase inhibitors or active ingredients identified as neurotoxins on EPA’s Toxics Release Inventory (www.epa.gov/tri/) groundwater contamination potential;
- toxicity to non-targets such as beneficial insects, birds, fish and aquatic organisms.

Pollinator services – Pollinator services are the combined inputs of both wild and managed pollinators (including bees, butterflies, hummingbirds, bats, beetles, flies and wasps) in an agricultural or ecological system.

Polluting fuels – Polluting fuels are those which release toxic substances into the environment through their use. These include petroleum, diesel fuel, gasoline, fuel oil, grease, oily sludge, oil refuse, oil mixed with waste, coal, wood and other fibers. Renewable fuels include solar, wind or hydroelectric power.

Reduction in use of resources – An increase in efficiency of resource use that results in a reduction of resource use per acre, lb. or other unit of production, over time. It is understood that not all resource use (e.g., fuel, water, etc.) will have potential for further reduction on an ongoing or annual basis. However, suppliers should demonstrate that they work to identify and implement the economically feasible techniques and technology to keep resource use to a minimum. Reductions in use should be evident over time or in comparison to industry average use.

Soil quality - Capacity of soil to sustain plant and animal productivity, maintain or enhance water and air quality and support human health and habitation. Indicators of soil quality include organic matter, structure, depth, Infiltration, bulk density, ph, electrical conductivity, extractable N-P-K, microbial biomass C and N, potentially mineralizable N and soil respiration.

Sub-supplier – Grower, farmer, producer of raw or pre-processed materials. Sub-supplier's product is processed by the supplier for delivery to Sysco. Sub-suppliers may be audited as part of the supplier audit, or the supplier may require sub-suppliers to be audited independently and make the audit report available for supplier use during its audit.

Supplier – Processor of product for delivery to Sysco. The supplier is responsible for the performance of sub-suppliers.

Validation – A process of evaluating completed actions to determine if the actions have resulted in the desired outcome. For example, validation would determine whether the erosion control program reduced the amount of soil loss.

Verification – A process of evaluating performance to determine if planned or expected actions have been completed or to determine the truth of statements or representations. For example, verification would determine whether wind breaks been installed as per the written IPM plan and statements made by the property owner.

RESOURCES

1. For questions or comments specific to the audit, contact the IPM Institute of North America. The Institute is an independent non-profit organization working under contract with Sysco to maintain the audit documents and procedures.

Thomas Green, Ph.D., C.C.A., T.S.P.
President
IPM Institute of North America
1020 Regent St.
Madison WI 53715
608 232-1410, Fax 608 232-1440
ipmworks@ipminstitute.org
www.ipminstitute.org

2. USDA maintains descriptive, region-specific **Crop Profiles** and **Pest Management Strategic Plans** at http://www.ipmcenters.org/index.cfm/center-products/. These detailed profiles and plans include important pests, common management practices, available pest controls and other information potentially useful to suppliers and auditors.

Your state may have a USDA Cooperative Extension Specialist experienced in your crop to help you identify IPM publications and other expertise available to you. USDA also maintains **Regional IPM Centers** at the following locations. These contacts can help you with questions and referrals to crop and region-specific expertise:

The North Central IPM Center includes Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota and Wisconsin. www.ncipmc.org

Dr. Susan Ratcliffe
Director, North Central IPM Center
University of Illinois Department of Crop Sciences
S-316 Turner Hall
1102 South Goodwin Avenue
Urbana IL 61801
217 333-9656
Fax 217 333-5245
sratclif@uiuc.edu

The Northeastern Region IPM Center includes Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and West Virginia. www.neipmc.org

Dr. Steve Young
Director, Northeastern IPM Center
The Insectary
Cornell University
Ithaca NY 14853
814 255-1720 Fax
607 255-8879
sly27@cornell.edu

The Southern Region IPM Center includes Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas and Virginia. www.sripmc.org

Jim VanKirk
Director, Southern Region IPM Center
1730 Varsity Drive, Suite 110
Raleigh NC 27606
919 513-8179
jim@sripmc.org

The Western IPM Center includes Alaska, Arizona, California, Colorado, Hawaii and other Pacific Islands, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. www.westernipm.org

Dr. Jim Farrar
Director, Western IPM Center
University of California, Davis
One Shields Avenue
Davis CA 95616
530 754-8378, Fax 530 754-8379
jjfarrar@ucdavis.edu

3. **The USDA Sustainable Agriculture Research & Education** program maintains a website at http://www.sare.org/ with links to sustainable ag grants and information.

4. **Appropriate Technology Transfer for Rural Areas (ATTRA),** houses a number of informational resources and publications, and lists current sustainable agriculture training and educational events and funding opportunities. Weekly electronic newsletter is available. http://www.attra.org

5. **Lifestyles of Health and Sustainability (LOHAS)** focuses on developments in the broader sustainability marketplace, including agriculture, building, energy, etc. Weekly electronic newsletter available. http://www.lohas.com

6. **IR-4 Project** develops research data to support registrations of pesticides for specialty crop uses, especially where economic incentives for registrants do not support data development, e.g., sales projections are too low to fund required studies. This includes beneficial biocontrol agents and biopesticides. http://ir4.rutgers.edu/

7. The following is a partial list of organizations experienced in assisting growers in implementing auditable IPM programs:

Cliff Ohmart
Program Manager
Protected Harvest
2901 Park Avenue, Suite A2
Soquel CA 95073
530 601-0740
cohmart@protectedharvest.org

Thomas Green
President
IPM Institute of North America
4510 Regent St.
Madison WI 53705
608 232-1410
Fax 608 232-1440
ipmworks@ipminstitute.org
www.ipminstitute.org

8. The following links provide online resources addressing **pollinator health, habitat, foraging and pesticide interactions**:

- "Pollinator Conservation" – The Xerces Society
- "Invertebrate Conservation Fact Sheet: Nests for Native Bees" – The Xerces Society
- "Pollinator Habitat Installation Guides" – The Xerces Society
- "Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms" – The Xerces Society
- "Managing Alternative Pollinators: A Handbook for Beekeepers, Growers, and Conservationists" – Sustainable Agriculture Research & Education (SARE)
- "Resources on Pollinators" – National Academy of Sciences
- "Native Pollinators" – Wildlife Habitat Council/Natural Resource Conservation Service
- "Attracting Pollinators to Your Garden Using Native Plants" – USDA
- "How to Reduce Bee Poisoning from Pesticides" – Pacific Northwest Extension
- Environmental Impact Quotient (EIQ) Calculator – New York State IPM Program
- "Wild Pollinators of Eastern Apple Orchards and How to Conserve Them" – The Northeastern IPM Center
- "The Pesticide Manual: 16th Edition" – British Crop Production Council
- ipmprime.com – IPM Institute of North America

9. Frequently asked questions (FAQ) concerning pollinators:

- What is the difference between managed and native pollinators?
    - Managed pollinators, often honey bees and bumble bees, nest in human-constructed hives and may come from commercial service providers or be established and maintained by the grower. Native pollinators, ranging from bees to bats to beetles to hummingbirds, includes those pollinators that have evolved in a location, or have been introduced there without human intervention. Some crops, such as almonds, require supplemental, managed pollination. Other crops are adequately pollinated by native pollinators. Some crops, such as potatoes, do not require pollinators.

- Is providing pollinator habitat beneficial if I am relying on managed pollinators only?
    - Sites using managed pollinators may still host significant native pollinator populations that require forage and habitat. Creating forage and habitat for native pollinators in non-cropped areas at any site benefits native vegetation, improves biodiversity and can provide food sources and refuge for beneficial insects that help control pests including insects and mites.

- Do sub-suppliers (growers) benefit from protecting pollinators from pesticides if they do not rely on pollinators? In other words: if a crop (e.g., potatoes) does not require pollination, is there a benefit to reducing pesticides toxic to pollinators?
    - Yes. Much like providing forage and habitat has benefits at all sites, protecting native pollinators from exposure to pesticides toxic to them can improve biodiversity and beneficial insect populations. In addition, drift from pesticide applications can impact managed or native pollinators off site, and managed or native pollinators may visit your production site, creating potential for exposure.