

PCOC BEST MANAGEMENT PRACTICES

Industry Guide to Best Management Practices For Protecting Water Quality

Foreword

The environment is everyone's concern. The assurance of clean water, clean air and a healthy environment is first and foremost in all of our minds. Best Management Practices ensure that we understand and perform pest control in an effective, practical method which will help prevent or reduce the risk of movement of our materials into waterways, air, and the environment.

Introduction

As Pest Management Professionals, our duty is to provide an effective service that protects our customers from property damage and disease caused by pests. It is possible to protect our customers and also preserve our environment by being good stewards of our pest control materials to minimize our impact on water and air quality.

In conjunction with the federal guidelines of the clean water act, and due to current technology that can detect minute amounts of chemicals making their way into our waterways, Pest Control Operators of California (PCOC) has developed the following Best Management Practices (BMP'S) through an Integrated Pest Management (IPM) approach. These Best Management Practices will help our industry keep pace with the growing technology of pest control and the increasing understanding of how our industry affects the environment.

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- 1.0 **Inspection (Evaluation Process).** Inspection is the foundation to any good Pest Management program. Various factors must be taken into account to properly evaluate a property and plan an effective pest prevention and treatment strategy. It is important that the Pest Management Professional (PMP) is properly trained on how to perform an appropriate inspection. The items to follow will help explain what to look for when developing strategies for pest management.
- 1.1 **Review Existing Problem with Customer.** An interview with the customer is important. Sometimes the customer's perception of the problem is different than the PMP. The customer is a good guide to evaluate current pest problems. Use the customer's input to gauge current problems and begin to assess the tolerance for specific pests.
 - 1.2 **Identify Pests.** The proper identification of pests is crucial. It is necessary to identify pests so that the biology and habits of the pest can be assessed to properly plan a pest management strategy. Mis-identification can result in the using the wrong control methods which could mean the unnecessary use of pest control materials and could even aggravate the problem.
 - 1.3 **Determine Tolerance Level.** Each customer will have a different sensitivity to pest populations. Some tolerance levels are driven by the fear of pests. Other customers may have a low tolerance level for pests because of an actual or perceived impact to their health or property. Some industrial settings are especially sensitive to pests such as rodents, birds, and other pests due to contamination risks to products and production equipment. Food manufacturers are particularly concerned with food safety and protecting their products from harmful pests. It is not always possible to ensure a pest free environment, so it is necessary to discuss what the tolerance level is. If the tolerance level for a particular pest has been exceeded, it is now time to integrate additional control techniques.
 - 1.4 **Assess Target and Non-Target Species.** The inspection and interview with the customer will reveal which pest species are of particular concern. Preventative control techniques for these pests should be implemented to keep the pest population below the tolerance level with minimal use of pesticides. The inspection and interview will also reveal which other species also inhabit a particular location. Effort must be made to ensure the safety of non-target species. This may require altering the

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time, location or type of treatments made. In situations requiring baiting, properly secured tamper resistant stations will help reduce the hazard to non-target species. Applications may be done carefully and focused as to prohibit the material from drifting or draining into habitats frequented by non-target species. Non-chemical treatment techniques may be employed in environmentally sensitive areas where non-target species are present.

- 1.5 **Identify Harborage Areas.** It is necessary to identify where pests are living. In many situations, harborage is more important than food. Actual and potential harborage areas should be identified for the pests of concern. An action plan should be developed with the customer to find the best way to reduce the pest harborages.
- 1.6 **Determine Conducive Conditions.** There are many conducive conditions that attract pests. Some common conducive conditions are moisture conditions, food sources for pests, and harborage areas. Once these conditions have been identified, then an action plan for correction them can be developed.
- 1.7 **Identify Waterways.** It is necessary to identify any waterway on or near the property to be treated. In the event of a liquid pesticide application, the PCO must be conscious of where the materials will end up. Applications should be avoided in close proximity to lakes, ponds, rivers, streams and other waterways. When liquid applications are absolutely necessary, be careful to avoid any drift and do not apply to the point of saturation. Always apply material in accordance with the label.
- 1.8 **Identify potential run off areas.** In addition to direct contamination of waterways, it is possible for pest control materials to “migrate” during precipitation or irrigation. The formulation of the pesticide and the surface type should be assessed to minimize run off. Treatments with residual materials in and near drains, gutters, ditches and other areas where water flows during precipitation or irrigation should be avoided.
- 1.9 **Evaluate Irrigation System / Watering Cycle.** Irrigation should be done to water plants, but considerations of over watering on pest control materials and pests should be made. Watering should not produce standing puddles or run off into gutters or drains. It is possible for some pesticides to be washed off of surfaces and into drains when over watering occurs. Since most drains eventually end up in streams and rivers, over watering may cause trace amounts of pesticides to

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end up in waterways. Over watering can also attract pests which may result in the need for additional chemical applications.

- 1.10 **Assess Environmental / Weather Conditions.** The PMP should evaluate weather conditions prior to making a chemical application. Pest control materials should not be applied to standing water or areas with saturated soil. In adverse weather conditions, necessary applications should only be made to areas of the structure that are protected from rainfall. Care should be taken to ensure that liquid pesticides have a chance to dry prior exposure to precipitation. If precipitation is expected, exterior treatments should be postponed or limited to areas protected from the weather.
 - 1.11 **Identify Landscape Type and Treatment Surfaces.** Some surfaces retain chemical applications better than others. For this reason, it is necessary to analyze where materials will be applied. Hardscapes, such as concrete and asphalt do not hold some materials very well. Applications to hardscapes should be minimized to prevent material from running off during precipitation and irrigation. Most pests do not live on hardscapes, so it is more effective to treat landscaped areas. Different soil types too, vary in how well they retain pesticides. Typically, sandy soils do not bond well with materials, while clay soils hold on to pesticides more readily. Care should be taken to focus treatments into pest harborages such as cracks and crevices to maximize effectiveness and minimize the amount of materials needed.
 - 1.12 **Documentation.** It is necessary to communicate the findings of the inspection in writing. When making recommendations for correction to a customer, do so in writing. This will reassure the customer that what you are saying is important and increases the chances that they will follow your professional recommendations.
- 2.0 **Non-Chemical Techniques.** There are a variety of non-chemical techniques that can be utilized in a proper pest management program. Below is a list of many of these of these techniques and there
- 2.1 **Determine Pest management strategy.** Evaluate the results of the inspection and determine which techniques will be integrated into the pest management program. Conditions that cause or attract pest species should be corrected. Some of these corrective measures are listed below

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- 2.2 **Sanitation**. Sanitation involves the removal of food and resources that pests need to survive. In many situations pest populations can be greatly reduced by removing the source of food. In a home this may be grease and food debris in a kitchen. Ants, Roaches, Flies and other pests will commonly infest homes when food is plentiful. In industrial settings, drains and hard to reach areas around appliances will contain food for many pests. If these areas are left unclean, then pest infestations will be difficult to control.
- 2.3 **Exclusion**. Exclusion is the process of preventing pests from entering a structure. This is an effective strategy to prevent infestations that come from the outside such as rodents and occasional invaders. Exclusion can be done by sealing potential entry points into the structure through cracks, holes, openings and around doors and windows. Some common materials that may be used include caulking, screening, steel wool, or any material that prevents a pest from entering a structure.
- 2.4 **Harborage Reduction**. Harborage Reduction is removing or reducing the places that a pest can live. Most pests require secluded and protected sites to live and breed. Perhaps more important than food is space. Storage of goods and waste provide excellent harborage for many pests including rodents, roaches, crickets, and many more pests. Simply removing boxes, pallets, junk and other stored items will eliminate the living space that pests need to survive. In some situations, storage cannot be reduced. Proper storage techniques, such using wire racks and storing items away from walls, may assist in reducing harborage places for pests.
- 2.5 **Vacuuming**. Vacuuming can be used to remove individual pests from a structure. This is particularly effective with solitary pests that invade structures. There is usually no benefit to spraying a solitary pest inside a structure, because vacuuming will kill the pest and remove it in one step. As long as the source of the pest has been identified and corrected, vacuuming can be used to remove these pests. Vacuuming can be integrated with traditional techniques to remove insects that have been flushed from harborages. Vacuuming can assist with flea treatments by removing some individuals and hatching others to come into contact with active pest control material, thereby increasing the effectiveness of pest control materials and decreasing the need for additional treatments.
- 2.6 **Steam**. Steam may be used to kill individual pests. Steam can be used to assist in the control of Bed Bugs, Moths and other

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pests by killing adults, pupae, larvae and eggs. Steam does not provide any residual protection so it is usually necessary to use traditional materials in combination with Steam.

- 2.7 **Heat**. Heat can be helpful to control a variety of pests. Drywood Termites, Bed Bugs, and many other pests can be effectively controlled by heat. Heat treatments must be done by trained professionals, because there is a risk of damaging sensitive items within the structure. Heat can be used as an all encompassing treatment or in smaller settings for other pests or situations. An example of integrating heat in a small setting would be covering a hornet's nest with a black garbage bag and letting it bake in the sun on a warm day. Heat can be very effective in some situations, but there are risks to be considered.
- 2.8 **Environmental Modification**. Environmental Modification involves changing the conditions that may be contributing to the pest's ideal habitat. There are many environmental factors that are important to a pest such as, humidity, habitat and availability of food and water. Some pests require high humidity. In these situations the best control may be to reduce the humidity. Many pests thrive in heavy vegetation around structures. Having the customer cut back vegetation will assist significantly in your control efforts. Many pests such as Rats, Birds and a variety of insects require water. Preventing over watering and utilizing proper irrigation techniques can help to control these pest species. Environmental modification largely requires cultural changes on the part of the customer and although sometimes difficult to accomplish, may be one of the most effective ways to control some pest population.
- 2.9 **Trapping**. Trapping is an effective way to reduce pests such as Flies, Rodents and other nuisance wildlife. Trapping is best used when integrated with other control strategies. Flies and Rodents also require sanitation and exclusion to begin to control populations. Trapping is not effective for most insect pests.
- 2.10 **Monitoring**. Monitoring is a form of trapping. Yes, an insect can be caught on a trap, but in most cases this has little or no impact on the population. Monitoring for insect pests helps to identify pest species, identify location of pests and estimate degree of infestation. Monitoring does not control pests, but it does help determine what techniques should be used and where they should be implemented. Proper monitoring reduces unnecessary treatments and improves the effectiveness of the pest management program. Trapping/Monitoring is also useful in insect identification.

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- 3.0 **Pesticide Application.** Pesticide Application is necessary for many effective pest management programs. It is important to discuss with the customer what the expectation for control is. If the tolerance level permits, more non-chemical techniques may be integrated prior to pesticide application. When pest populations exceed tolerance levels established with the customer, it is necessary to integrate pesticide application.
- 3.1 **Product Selection.** When you apply any product you assume the legal responsibility for using it strictly in accordance with label and instructions. The application of pesticides is the most common pest control method used in and around buildings, enclosed areas and vehicles. Some pesticides provide chemical barriers to prevent insects from entering the building. Pesticides are also used to treat soil, wood, fabrics and other items to prevent pest infestation. Pesticides are available in baits, liquids, dust and gases. The type of pesticide used and the kind of formulation selected is based on the life habits of the pest, its density and its location. Other methods becoming more popular are biological control and exclusion. It is of the utmost importance to start with an inspection of the situation to determine the best way to control the pest. A thorough inspection will enable you to make the proper decision on what to do.
- 3.2 **Lowest Effective Dosage/Volume.** When determining the most effective way and control of pest, start with an inspection and always read and follow the label directions. It should be the goal of the modern pest control technician to get the insect situation under control with the least amount of risk to the environment. Sanitation reports, exclusion, monitoring and communicating with your customer will in the long run help you control the insects. Glue boards, mechanical traps, cleanliness and habitat modifications are other alternatives to getting the situation under control. Pests in structures are usually more effectively controlled when a combination of compatible control methods can be used. Use only the amount of material necessary for control to minimize unnecessary application of materials.
- 3.3 **Use of Appropriate Formulations.** Pesticides as defined by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) are “any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any insects, rodents, nematodes, fungi, weeds or any other forms of life declared to be a pest.” So choosing the correct formulation

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requires the knowledge of the professional pest control technician. Pest control materials are formulated to maximize the effectiveness of the active ingredient on a particular surface or application. In general, smaller particles such as emulsifiable concentrates are effective for applications to soil or other applications when it is desired to have the material soak in. In contrast, this formulation is ineffective for treating crawling insects on porous surfaces such as concrete. Larger particles such as microencapsulated formulations, are most effective for treating porous substances when a residual is desired on the surface. Remember, the PMP must always follow the label instructions.

- 3.4 **Follow the Label.** Always apply pesticides in strict accordance with label instructions. Furthermore, never use a pesticide in a building or other areas unless people living or working there can be protected from exposure. The label will not only tell you how to control insects but will give instructions on personal protective equipment (PPE) exposure, medical, disposal, etc. Reading the label and becoming familiar with its information before the product usage should be common practice of the professional pest control technician.
- 3.5 **Site Preparation.** The cleaning of surfaces will greatly improve the effectiveness of pesticides by removing grease, oils, dust and other contaminants that interfere with their function. To assist in good sanitation make sure areas are well lighted. Ask the customer to remove any items that should not be exposed to pest control materials such as children's toys, pet food and shoes.
- 4.0 **Application Technique.** When making a pesticide application, it is necessary to use the proper techniques to maximize effectiveness, protect the environment from unnecessary risk and reduce the need for additional applications.
 - 4.1 **Site Determination.** Site Determination is an important part of the planning stage. When determining the site to be treated you should always refer to the product label for any restrictions that may exist with the product(s) of choice. A visual inspection is also extremely important in determining any additional precautions that may be necessary for the site. Treatment sites may have surfaces whose characteristics must be evaluated before applying a pesticide depending on the type of surface. A pesticide can be absorbed and rendered ineffective, or the surface may be stained or etched. Concrete, for example, is porous and tends to absorb liquid sprays, reducing the amount of

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residue on the surface that is available to control target pests. Floor coverings such as linoleum, tile, and carpeting can be stained or etched by some products or solvents. Certain wallpapers and carpets contain dyes that may run, dissolve, or change colors if exposed to components of some pesticides. Paint and other finishes used on walls or woodwork may also react with these chemicals to produce spotting or discoloration. Fabrics of all types, and the dyes used for patterns and color, may also react differently. than a clean one. Fabrics can also absorb a liquid pesticide, reducing pest control effectiveness. Dust formulations leave an unsightly residue if applied to surfaces of furniture, woodwork, fabrics and other items in the treatment area.

- 4.2 **Surfactant/Adjuvant.** A Surfactant or Adjuvant may be used to alter the selectivity as well as the effectiveness of pesticides. Use stickers, spreaders, and drift control agents to keep spray mixtures on target. Use surfactants to change the uptake by target pests, and make pesticides attractive to target organisms. These techniques can reduce drift and enhance effectiveness. Improving uptake by pests and making the material more attractive to specific pests may allow you to apply less pesticide, which will result in less risk to off target species such as natural enemies and beneficial insects which may help control pests. By keeping pest control material on target, we can help protect off target species, people, and the environment.
- 4.3 **Drift Management.** Management of drift is extremely important. If pesticides are not carefully applied, they may drift beyond the treatment site and become deposited as unacceptable residues on surfaces not intended to be treated. These residues can possibly endanger non-target organisms. Residues from improper application or improper rinsing of equipment may result in contamination of surface or groundwater. When applying liquid sprays, use low pressures and large nozzle orifices. This prevents formulation of small droplets subject to drift. Avoid make an outdoor application of a liquid spray when the wind is blowing faster than 5-10 miles per hour. If there is a slight wind, select a formulation or adjuvant that reduces drift. Be especially careful if you are treating near fruit trees, vegetable gardens, flowers, laundry being air dried, cars, windows, dark surfaces that might spot, pets, pet or livestock food and water containers, fish ponds, bird baths, swimming pools, saunas, spas, or outdoor furniture. Avoid outdoor applications that may drift to children's play areas, sandboxes,

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swing sets, or lawns and shrubbery that children contact. Do not apply a pesticide in outdoor locations where residues can be carried into a well, stream, pond, or other water source. Never drain or wash application equipment where runoff into sewers, sinks, sumps, or drainage tiles can occur. When making a liquid or dust application inside a structure, keep the spray or dust away from air ducts or blowers to prevent the material from being blown around.

- 4.4 **Avoid Runoff.** Avoid runoff of product at the treatment site. Always apply the product as recommended on the product label. The amount of material that is necessary to be effective for the target pests is minimal. The amount of material on the surface should be enough to wet the surface. Material should not be applied to the point of runoff. Runoff can reach waterways if near water entry points such as storm drains, and grades that are prone to runoff. Time the application to coincide with warm, dry weather. Recent precipitation or the threat of precipitation should be a key consideration in applying materials on the exterior
- 4.5 **Site Specific Applications.** After a pest has been identified and non-chemical techniques have already been employed, it may be necessary to apply pest control materials. Pesticide applications should be made to specific sites in which the target pests have been identified. Applications should be made to pest harborage areas. There is little benefit for treating inactive areas or surfaces that are not pest harborages. By focusing treatment to areas with pest activity and into harborages, maximum control can be achieved while preventing unnecessary use of pest control materials.
- 4.6 **Bait Usage.** Baits are a popular formulation used by professionals. Baits are especially effective against cockroaches, ants, and termites. Insecticide baits are formulated when the active ingredient is mixed with food or an attractant carrier. Baits are applied directly to pest harborages or into refillable bait stations. Convenient ready-to-use bait stations are also available. Most active ingredients used in baits are slow-acting so that the insects are not affected before they can carry the bait back to others in the colony. Advantages of bait formulations are that they are usually ready-to-use, they are used at low concentrations, they can be placed only where needed, and they can be removed when control is achieved. Baits provide the least impact to the environment, because there is typically low percentage of active ingredient and the material

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does not travel from the application site. Control with baits often requires more time, and application costs may be higher than for other formulations.

- 4.7 **Spill Prevention and Control.** It is important to make proper applications to minimize environmental impact. It is even more important to prevent spills of concentrate and diluted pest control materials. Proper equipment maintenance will prevent many leaks. Even with the best prevention, there is still the potential for an accident. Careful planning and procedures are necessary to be able to react promptly and effectively to a spill. Having a spill kit available is a must. No truck should ever leave the parking lot of their place of business without a spill kit on board. You should always have your spill kit accessible in the event of a spill, leak or accident. Inspect the spill kit often. If anything is used out of the spill kit, be sure to replace or replenish what was used. Conduct practice spill control procedures at least annually.

- 5.0 **Post Application.** After a pest control service, it necessary to take the proper steps to ensure maximum control and establish realistic expectations with the customer.
 - 5.1 **Review with Customer.** Prepare all written materials specific to work done to inform the customer of what you have done. Include any pest control materials and any non-chemical procedures used. Review any pertinent label and MSDS information that may be necessary, such as reentry interval. Take credit for your hard work. Remember, a pest control program integrating non-chemical and minimal impact application procedures takes much more work on the part of the PMP. Because these techniques need more professional labor, there is typically a higher cost for the consumer.
 - 5.2 **Post Inspection.** After an application has been made, take time to inspect the property again. If necessary, ensure that people and pets cannot enter treated areas until allowed per label requirements. Review non-chemical techniques to ensure they are still in place to help prevent re-infestation of pests.
 - 5.3 **Expectations.** Review the proper control expectations with the customer. Most pest control strategies take time to work. When integrating non-chemical techniques first, the time to control infestations may be extended. The integration of both non-chemical and minimal impact applications will maximize the control of pests. Even with the best of control strategies, pests do not just disappear. Let the customer know what they should

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expect with pest activity after treatments. Discuss what the tolerance level is after treatment and instruct the customer to call if the tolerance threshold is exceeded.

- 5.4 **Recommendations.** It is important to discuss recommendations for the customer to implement. Many of the non-chemical techniques need to be implemented by the customer. It is the responsibility of the PMP to make these recommendations and provide a written list of corrective measures. Corrective measures such as sanitation, exclusion, harborage reduction, and others should be contemplated and completed by the customer. Larger measures, such as extensive exclusion, may be costly for large commercial facilities. Encourage your customer to budget these corrective measures into future budgeting periods to help with pest control efforts. An effective pest management program requires cooperation between the PMP, building owners, inhabitants, housekeeping and maintenance staff. Be sure to communicate with the customer, because the customer is an integral part of providing safe and effective pest control.
- 6.0 **Conclusion.** By following the Best Management Practices for General Pest Control established by the Pest Control Operators of California, you can do your part to help sustain our industry and preserve the environment. We all want to leave our children and future generations clean water, clean air and clean environment. Best Management Practices require a great deal of training and practicing techniques which are not the easiest and not the cheapest. This takes commitment and determination, but the reward is worth the effort.
- 7.0 **Appreciation.** Thank you to the entire General Pest Control Committee for your efforts in creating this guide. Special thanks to Mike Bullert (Big Time Pest Control), Baron McDonald (Clark Pest Control), Bob Golubski (Clark Pest Control), and Gerry Weitz (Hearts Pest Management) for your extensive contribution.
- 8.0 **References.** References Include:

“The Safe and Effective Use of Pesticides” - Publication 3324
“Residential, Industrial, and Institutional Pest Control” - Publication 3334
“Forest and Right-of-Way Pest Control” Publication 3336
“Handbook of Pest Control” – Mallis 7th Edition and 9th Edition
Internet