



INFECTION PREVENTION FOR CANNABIS FACILITIES

CLEANING AND DISINFECTION GUIDE



ENDORSED BY:



ESTABLISHING BEST PRACTICES FOR CLEANING AND DISINFECTION

Integrated pest management (IPM) is a cornerstone for any successful cannabis operation. The threat of contamination is always present and gaps in your IPM protocol can result in negative consequences for your business.

Although it is widely acknowledged within the cannabis community that cleaning and disinfection are vital components of IPM, the guidance that exists within this emerging industry in Canada is in its infancy. So, while we generally have a good understanding of the need to maintain good sanitation practices, we are just beginning to understand the best practices for cleaning and disinfection within the IPM framework.

This guide serves to provide a foundation for best practices in cleaning and disinfection that can be implemented in your facility.

FOUR MAIN TYPES OF CONTROL STRATEGIES FOR CANNABIS FACILITIES¹

1

CULTURAL CONTROLS

Including proper plant nutrition and pruning, while maintaining a clean and sanitary environment

2

PHYSICAL CONTROLS

Including the use of barriers such as traps or screens

3

BIOLOGICAL CONTROLS

Including the role of beneficial insects, nematodes and mites

4

CHEMICAL CONTROLS

Including pesticides applied to plants

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UNDERSTANDING THE BASICS

It is not uncommon for the terms “cleaning,” “sanitizing,” and “disinfecting,” to be used interchangeably.

HOWEVER, THESE TERMS ARE DIFFERENT AND CAN BE DEFINED AS FOLLOWS^{2,3}:

Cleaning

- The process of physically removing dirt and debris from a surface. Although the cleaning process is vital for preventing the spread of pathogens, it may not actually kill any microorganisms.

Sanitizing

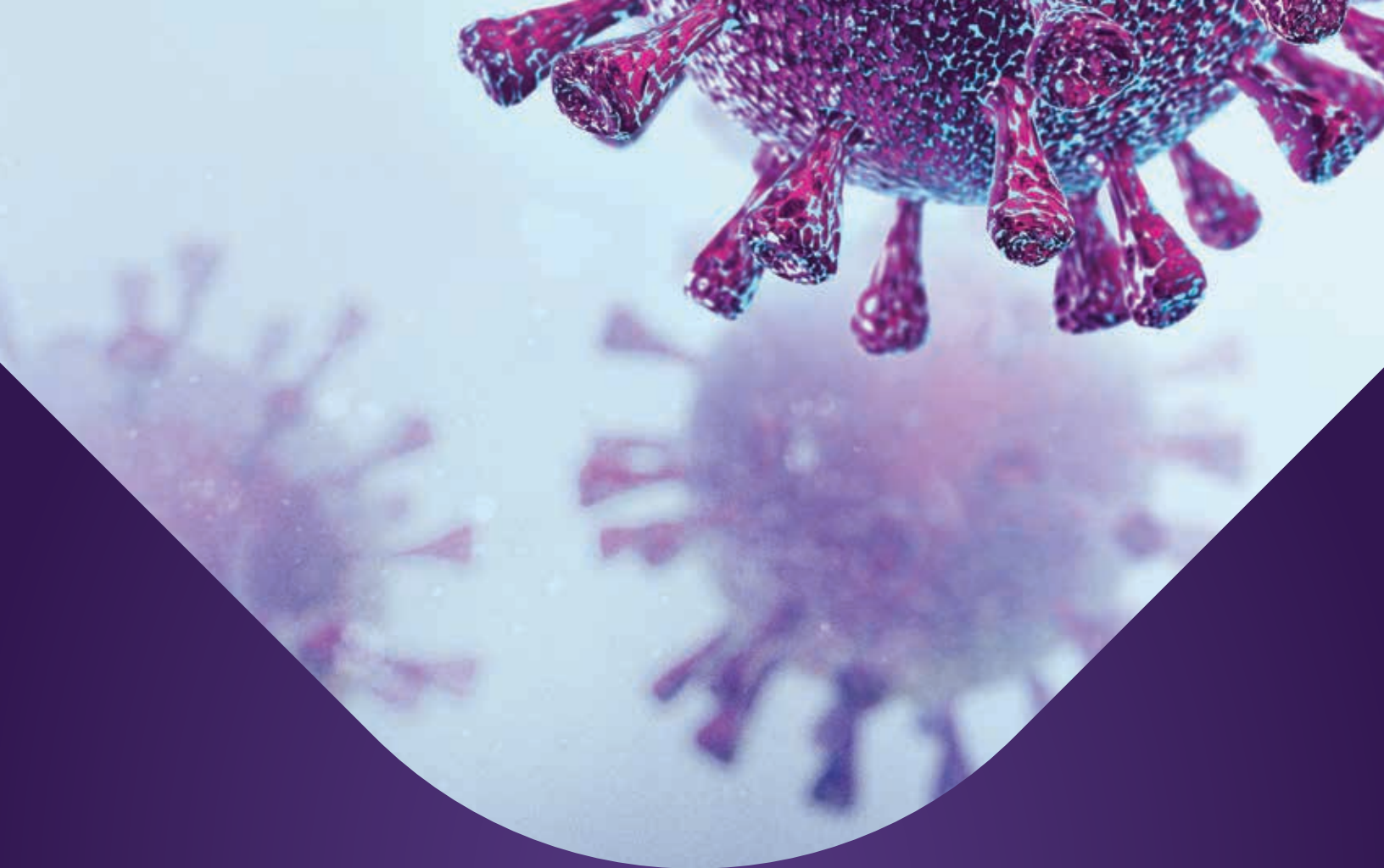
- The process of reducing the level of bacteria on a surface to a safe level, as determined by public health or other standards. It is important to note that this process does not reduce the level of other pathogens, such as viruses or fungi.

Disinfecting




- The process of killing infectious microorganisms on surfaces, which can include bacteria, viruses, and fungi. In environments where infectious microorganisms may be present, disinfection is required to ensure that the risk of disease transmission from contaminated surfaces and equipment is minimized.

It is also important to understand the difference between these terms from a regulatory standpoint. Products used for cleaning are not regulated, whereas disinfectants are diligently regulated by Health Canada. Products claiming to be disinfectants need to conduct efficacy testing following strict protocols defined by Health Canada against the pathogens they claim to kill. Registered disinfectants in Canada carry a Drug Identification Number (DIN) on their product label. Products that are bactericidal, virucidal, and fungicidal have been tested against surrogate organisms to demonstrate efficacy against bacteria, viruses, and fungi, respectively.

Infectious microbes such as powdery mildew, grey mold and fusarium are all examples of common pathogens within cannabis facilities. Investing in a cleaning and disinfection program can help protect the health and quality of your plants.



Here are some examples of common cannabis pathogens you may encounter, with their Health Canada surrogates for disinfectant efficacy claims⁴:

	Efficacy Claim	Surrogate Organism(s) for Registered Disinfectants	Relevant Cannabis Pathogens
	Bactericidal	<i>Staphylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> , <i>Salmonella enterica</i>	Bacterial blight (<i>Pseudomonas cannabina</i>), <i>Pseudomonas aeruginosa</i> , <i>E. coli</i>
	Virucidal	Several; Poliovirus Type 1 or Canine parvovirus are common	Influenza virus, Norovirus, Coronavirus*
	Fungicidal	<i>Trichophyton interdigitale</i> <i>Trichophyton mentagrophytes</i>	Powdery mildew, Grey mold, <i>Fusarium</i> , <i>Pythium</i>

*Although not relevant to plant health, these pathogens can be of concern to staff in cannabis facilities.



7

STEPS FOR OPTIMIZING INFECTION PREVENTION

There is more to cleaning and disinfecting than simply selecting effective products. Consideration needs to be given into specific protocols that are suitable for your Cleaning and Disinfection Program.

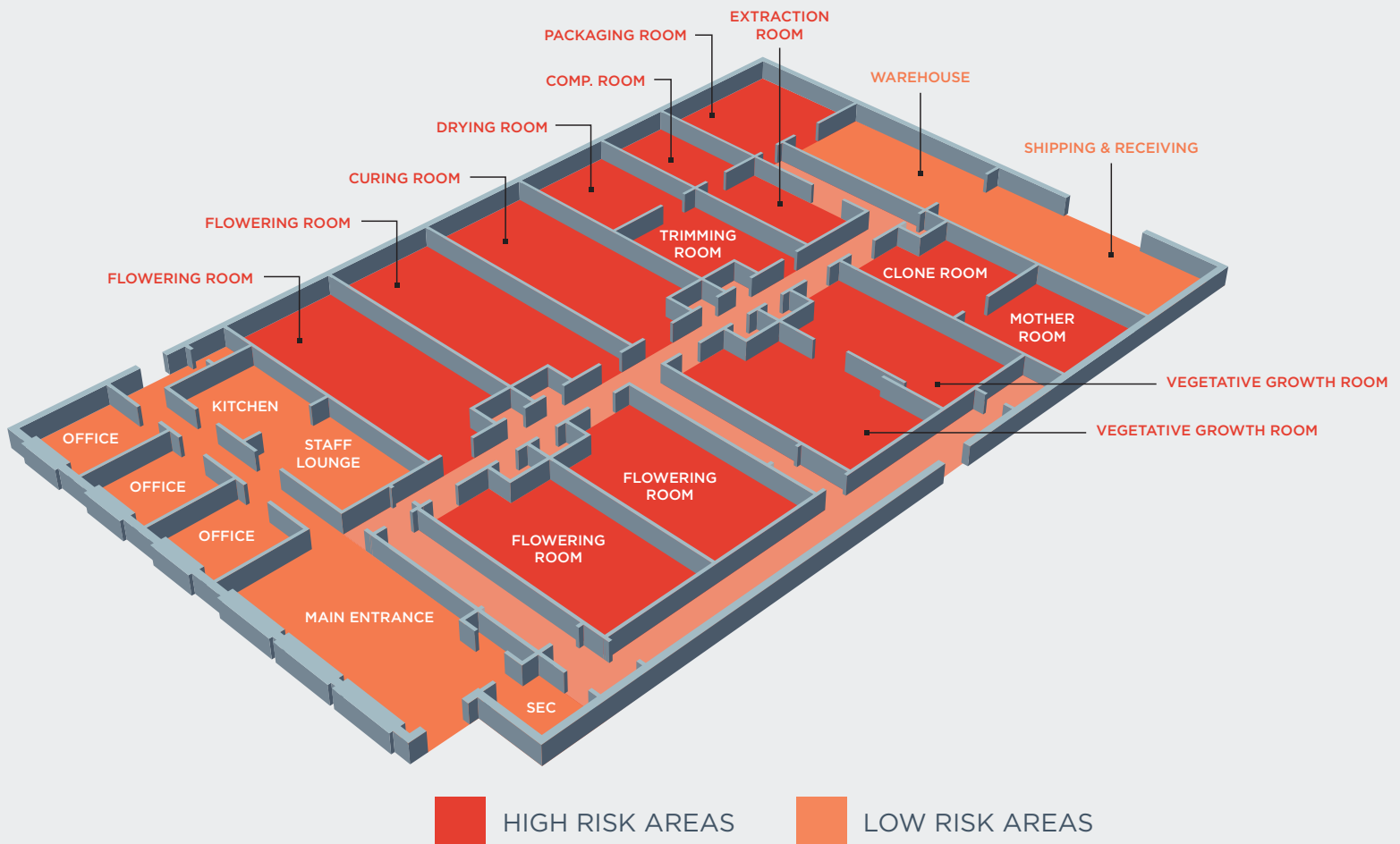
The following 7 steps can help optimize infection prevention protocols

1

CLARIFY ROLES AND RESPONSIBILITIES WITHIN YOUR TEAM

Ensure each team member understands the protocols within your Cleaning and Disinfection Program. A Cleaning and Disinfection Working Group or 'committee' can be developed in order to assign specific roles for each staff member. Determine which team member will be responsible for cleaning and disinfecting each surface and

piece of equipment and how often this should be conducted (e.g. after each use, between lots, hourly, twice per day, daily, weekly etc.). Each individual should also be designated an area within the facility to ensure the infection prevention protocols are applied to all surfaces and equipment.





IDENTIFYING HIGH AND LOW RISK AREAS FOR THE TRANSMISSION OF PLANT PATHOGENS

AREA	RISK LEVELS	
	HIGH RISK	LOW RISK
Shipping and receiving		✓
Vegetative growth room	✓	
Flowering rooms	✓	
Drying rooms	✓	
Extraction room	✓	
Mother room	✓	
Clone room	✓	
Trimming room	✓	
Kitchen		✓
Staff lounge		✓
Office areas		✓

2

CONDUCT AN INFECTION RISK ASSESSMENT THROUGHOUT YOUR FACILITY

The risk of transmission varies within a cannabis facility. For instance, areas in which production or processing occurs, are at an increased risk of plant infection and contamination when compared to shipping and receiving areas.

In order to assess the level of risk of each area within the facility, a colour-code or numbering system can be implemented. For example, placement of a red tag in a high-risk production area can be an indicator that a more stringent cleaning and disinfection procedure may be required. This identification system will also help minimize the movement of plants, equipment, and personnel from low-risk to high-risk areas. A team member should be responsible for ensuring that any change in risk status is clearly communicated to each member of the Infection Prevention Working Group or committee.



3

CONSIDER THE MODE OF TRANSMISSION FOR POSSIBLE PATHOGENS IN ORDER TO BREAK THE CYCLE OF INFECTION

When designing your infection prevention program, it is important to consider the possible modes of transmission for pathogens of concern. For instance, powdery mildew can be spread through the spores in the air and through contaminated equipment. In this case, infection prevention measures should focus on maintaining adequate air circulation as well as cleaning and disinfecting any tools, equipment or surfaces that may come in contact with other plants.

Improper use of disinfectants, whether by using incorrect concentrations or not following the product label directives, can result in the spread of infectious pathogens as opposed to their elimination.



Here are some examples:

Mode of transmission	Description	Transmission precautions
AIRBORNE	Fungal spores, such as powdery mildew and <i>Fusarium</i> , can travel through the air from one plant to the next	<ul style="list-style-type: none"> ● Maintain adequate air circulation ● Give plants sufficient space to allow for proper air flow ● Avoid disinfecting at high temperatures to limit the production of aerosols
FOMITE	These include tools, such as trimmers and contaminated clothing or footwear worn by workers, that can transmit pathogens between plants	<ul style="list-style-type: none"> ● Clean and disinfect tools, pruners, trimmers, pots and shelves between use or lots ● Ensure that shoe covers are worn by workers ● Limit movement from room to room ● Arrange workflow from least to most contaminated areas throughout the facility
CONTACT	Transmission of pathogens may occur when there is direct contact between plants that have not been given sufficient space. This may include soil that has been contaminated by infectious agents or by the hands of workers.	<ul style="list-style-type: none"> ● Give plants sufficient space to minimize plant-to-plant contact ● Regularly inspect soil for common pathogens ● Ensure that the levels of moisture and fertilizer are appropriate ● Ensure that workers are wearing adequate protective equipment and are practising routine hand hygiene ● Ensure tables are properly cleaned and disinfected between lots, especially if flooded for plant intake

While disinfecting surfaces within growing rooms is always important to prevent the transmission of plant pathogens, it is also necessary to disinfect other non-production areas of your facility to protect employees from human pathogens, such as coronaviruses and influenza.

TEAM HEALTH: PANDEMIC PLANNING AND BEYOND

We often think about infection prevention as it applies to the health of cannabis plants, but keeping your team healthy is just as important. Without a team of healthy staff, your day-to-day operations would not be possible, and absences due to illness can have a significant burden on your facility. Fortunately, many of the same strategies that you use in plant contact areas can also be applied to staff areas as well, both during a disease outbreak and for routine prevention.

KEEPING YOUR TEAM HEALTHY

- 1 Have plans in place for both routine cleaning and disinfection, as well as for pandemic or outbreak scenarios. For pandemic and outbreak scenarios, follow relevant public health guidance on measures that should be taken, including the need for physical distancing or wearing masks and access to perform hand hygiene.
- 2 For your routine cleaning and disinfection program for team member health, develop a list of areas where team members may congregate, and the surfaces that will need to be cleaned and disinfected.
- 3 Determine the frequency of disinfection for each surface, and who will be responsible for ensuring that the protocol is followed. High-touch surfaces such as door handles and light switches may need to be disinfected daily, while lower-risk surfaces such as floors may only require occasional disinfection.



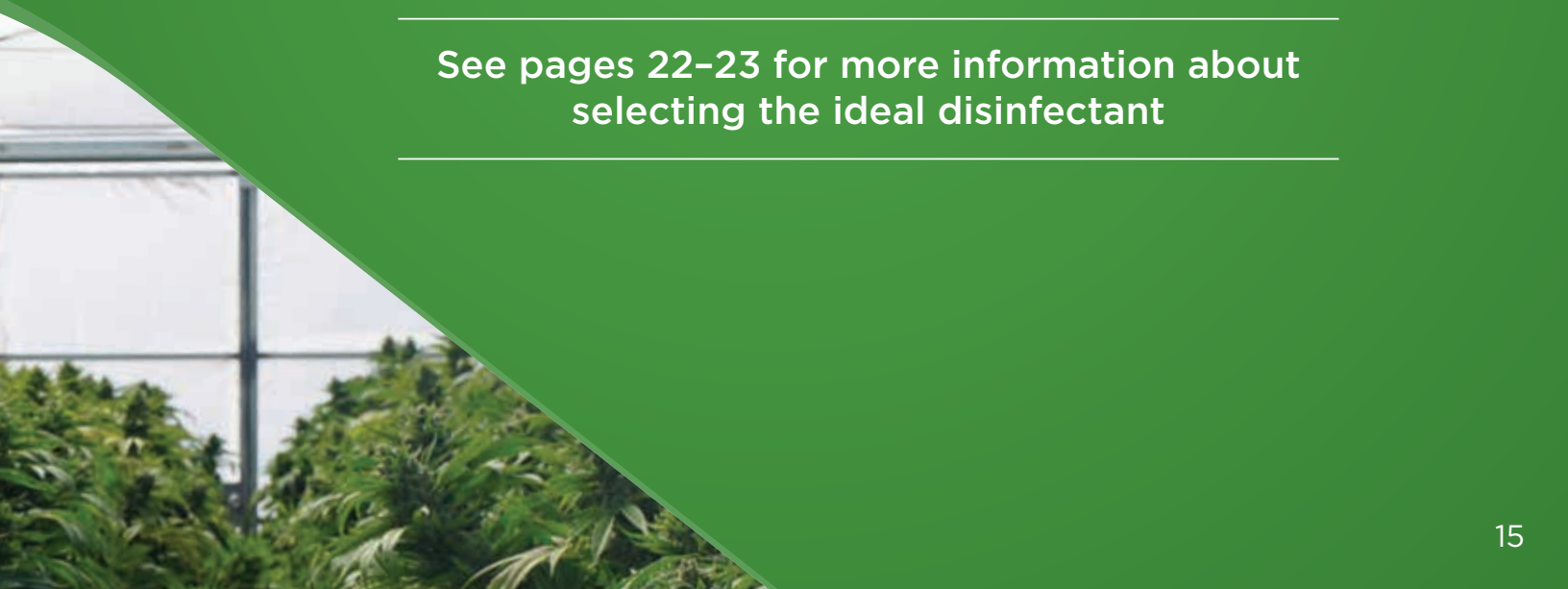


CHOOSING A DISINFECTANT

Many of the same factors that guide your disinfectant selection for plant health also apply to team member areas. In particular:

- 1** To ensure that occupational safety is prioritized, choose a product that is non-irritating and does not require the use of PPE at in-use concentrations.
- 2** Choose a product with efficacy against a broad spectrum of relevant pathogens, including harder-to-kill viruses, in a rapid contact time. This will facilitate quick turnover of staff areas and save valuable time.
- 3** Choose a product that is easy to use, and that is available in convenient formats such as pre-moistened wipes or ready-to-use liquid. Having a simple protocol can improve compliance, and therefore greatly reduce the risk of infection.

**See pages 22-23 for more information about
selecting the ideal disinfectant**



4

SELECT AN APPROPRIATE DISINFECTANT FOR YOUR FACILITY

Consider the following questions when determining whether a disinfectant is appropriate for your facility:

- **Will you be using separate products for cleaning and disinfecting?**
 - Some disinfectant products will only work on surfaces that have been pre-cleaned with a detergent, while others have detergents built into their formulations. Those with a detergent package may function as one-step cleaner disinfectants, eliminating the need for a separate pre-cleaning step with a detergent.
- **Will you have one disinfectant for all purposes, or will you use multiple products?**
 - If you want to use a single product for disinfection, it's important to ensure that the disinfectant chosen has efficacy against all pathogens of concern in your facility, for both plants and staff.
- **What application methods will you prefer to use in your facility?**
 - For larger areas, a disinfectant that can be applied through automated application equipment, such as backpack sprayers and hose end foamers, may be ideal. For smaller surface areas or hand-held devices, pre-moistened wipes may be more convenient.

The answers to these questions are dependent on the type of pathogens affecting your facility, as well as the range of surfaces that require cleaning and disinfection.



Different types of pathogens are more susceptible to disinfectants – meaning they are easier to kill than others. The following diagram outlines the hierarchy of susceptibility of pathogens to disinfectants. Look for a disinfectant with claims against harder-to-kill organisms such as Norovirus or Poliovirus to be confident that it will be effective against a broad spectrum of pathogens.

HIERARCHY OF SUSCEPTIBILITY⁵

Microorganism

Bacterial spores (*Clostridioides difficile*, *Bacillus subtilis*)

Mycobacteria (*Mycobacterium tuberculosis*)

Non-enveloped viruses (Norovirus, Poliovirus)

Fungal spores (*Trichophyton mentagrophytes*, Powdery mildew, Grey mold, *Fusarium*)

Vegetative bacteria (*Staphylococcus*, *Pseudomonas*, *Salmonella*, *E. coli*)

Enveloped viruses (Coronavirus, Influenza, Hepatitis B)

Mycoplasmas

MOST
RESISTANT

LEAST
RESISTANT

5

TRAIN YOUR ENTIRE TEAM REGARDING THE PROPER USE OF THE SPECIFIC DISINFECTANT PRODUCT SELECTED

All team members should understand all aspects of the selected product. This includes how to properly prepare the solution, how to apply it to appropriate surfaces, what PPE is required, and what storage requirements apply, if any.

The manufacturer or sales representative of the selected disinfectant will provide support services for your facility when implementing their product. This may include providing training materials, lunch-and-learn programs, or site visits to troubleshoot any issues that may arise.

Ensure that Safety Data Sheets (SDS) are made available and accessible for all team members as per workplace health and safety standards; Section 2 of the SDS contains key details about the product's safety considerations.



6

ENSURE THE SELECTED DISINFECTANT AND ANY CORRESPONDING TOOLS ARE READILY ACCESSIBLE

To efficiently minimize the spread of infection, all materials required for cleaning and disinfecting should be readily accessible. These items include measuring devices (mixing stations, hand pumps, etc.), bottles, buckets,

and clean cloths that should be made available throughout the facility. This will help minimize unnecessary movement of people and equipment, reducing the risk of cross-contamination.



7

IMPLEMENT ROUTINE **QUALITY-CONTROL** MEASURES AND COMPLIANCE MONITORING

If using secondary bottles to apply a disinfectant, ensure that workplace labels are applied and marked with the appropriate expiration date to ensure the solution is still effective. Records should be created and maintained to indicate when areas have been disinfected, and by whom.

In addition, it is a good practice to periodically evaluate the effectiveness of your infection control protocols. Methodologies such as ATP testing can play a role in assessing whether cleaning and disinfecting processes are successful.

Please see page 33 for more information about ATP testing.





SELECTING THE IDEAL DISINFECTANT⁶

When it comes to selecting an ideal disinfectant, the key is finding the product that best suits the individual needs of your facility. The Centers for Disease Control have identified some general qualities to consider when evaluating disinfectants:



Broad spectrum



Fast-acting



**Not affected by
environmental factors**



Non-toxic



**Surface
compatibility**



Odourless



Stable



Soluble



Cleaner



**Environmentally
friendly**



Economical



Easy to use

CLEANING ABILITY (DETERGENCY)

In cannabis facilities, the removal of resin, oils, and other debris will be required before cleaning and disinfecting can occur. Once major dirt and debris are removed by dry cleaning, a fine layer of residue may remain on surfaces. Some disinfectants have detergents built into their formulation, making them effective in the presence of this leftover organic residue on surfaces. Some may also be labelled as “one-step cleaner/disinfectants,” meaning they can be used as the only product in the process. Other disinfectants, such as commercial bleach and isopropyl alcohol, have no detergency properties. This means that surfaces should be cleaned with a separate detergent prior to disinfecting with these products, or the disinfectant may be rendered inactive by organic residue. In addition, the presence of detergents can help the disinfectant achieve better surface coverage when applied through foaming applications.



BROAD SPECTRUM CAPABILITIES

It may seem obvious, but one of the most important factors to consider is the effectiveness of the disinfectant in killing pathogens of concern to your facility. Within cannabis facilities, fungal pathogens are of particular importance. Therefore, products with fungicidal efficacy (look for a claim against *Trichophyton mentagrophytes* on the label) are best suited in environments where cannabis pathogens may be present.



FAST-ACTING ABILITIES (CONTACT TIME)

In addition to the effectiveness of the disinfectant, it is also important to consider the time it takes to act on the pathogen. 'Contact time,' or 'dwell time' is the length of time that disinfectants must remain wet on the surface to effectively kill pathogens. Long contact times may be unrealistic in busy production facilities, due to the additional time added to the overall process. Ten minutes is fairly standard among commonly-used disinfectants, though newer formulations have contact times as low as 30 seconds depending on the pathogen. If the solution dries before the contact time is met, reapplication is required to ensure disinfection occurs.



NON-TOXIC AND ENVIRONMENTALLY FRIENDLY PROPERTIES

Although legacy disinfectant formulations often compromised safety for efficacy^{7,8}, newer formulations can be highly effective while remaining safe for users and plants alike. Ideally, disinfectants are non-toxic, non-irritating and odourless, and PPE should not be required when handling the product at in-use concentrations. Furthermore, disinfectants should be biodegradable to minimize any negative effects to the environment, especially in facilities where runoff leads outdoors.



SURFACE COMPATIBILITY

The manufacturer of your disinfectant can help you understand the compatibility of various surfaces with the selected product in order to minimize damage. For instance, alcohol-based disinfectants may dry out and damage certain plastics over time. Ideally, disinfectants should be compatible with a wide range of surfaces and materials, to protect your assets.



EASY TO USE

Disinfectants should be easy to apply throughout your facility, enhancing your team's comfort level when using the product. Consider products that do not require mixing multiple parts, as well as products that are suitable for use with common application equipment.

COMMONLY USED DISINFECTANT CHEMISTRIES⁹

	Isopropyl alcohol (IPA)	3%–35% hydrogen peroxide	Sodium hypochlorite (bleach)	Potassium peroxymonosulfate	Accelerated hydrogen peroxide [®]
CONTACT TIME	5 to 10-minute virucide, bactericide and fungicide	10-minute virucide, bactericide and fungicide	5 to 10 minute virucide, bactericide and fungicide	10-minute virucide, bactericide and fungicide	3 to 5 minute virucide, bactericide and fungicide
FEATURES	<ul style="list-style-type: none"> Limited efficacy against non-enveloped viruses PPE required, highly combustible 	Due to the high concentration of hydrogen peroxide (23%), PPE is required for handling	Higher concentrations may cause respiratory irritation	<ul style="list-style-type: none"> Severely irritating to eyes and skin, PPE required Releases chlorine into the environment 	Non-toxic, non-irritating to eyes and skin, use-solutions do not require the use of PPE
DETERGENCY CONSIDERATIONS	No inherent detergency properties (Surfaces must be pre-cleaned)	No inherent detergency properties (Surfaces must be pre-cleaned)	No inherent detergency properties (Surfaces must be pre-cleaned)	Some detergency properties	<ul style="list-style-type: none"> Excellent detergency properties One-step clean-disinfectant

Accelerated Hydrogen Peroxide[®] is a one-step cleaner and disinfectant that meets the standards established by the CDC. Refer to pages 10 to 11 for more information.



10

COMMON DISINFECTION MISTAKES

Avoid the following when implementing protocols
for your Cleaning and Disinfection Program

1

EYEBALLING WHEN DILUTING DISINFECTANT SOLUTIONS

It is not uncommon for users to either overuse a product, which may provide a sense of security that pathogens are being killed, or conversely, to underuse a product in an attempt to save money.

Neither of these approaches should be taken.

Each disinfectant has been proven to be effective at its specified dilution, and there is no added benefit to using more than what is required. If anything, this may result in wasted product, as well as potential issues with stickiness from extra surfactant residue, especially when using a one-step cleaner-disinfectant product.

Under-using the product could present serious concerns that the disinfectant will not be strong enough to work properly. Always follow the instructions on the product label. For best results, use a calibrated mixing system, test strips, or a measuring cup to ensure the solution is properly diluted.

2

FAILING TO REACH THE DESIGNATED CONTACT TIME¹⁰

The contact time will be stated on the disinfectant product label and must be adhered to in order to ensure it will be effective against pathogens. Disinfectants were tested at this contact time, so if the solution is allowed to dry prematurely, there is no guarantee that pathogens would be reduced to a safe level. If the disinfectant evaporates before the contact time is reached, it will need to be reapplied to ensure that efficacy is achieved.

3

CONFUSING SANITIZING WITH DISINFECTION

As mentioned previously, sanitizing is not equivalent to disinfection and it is important to understand the difference to ensure your team is following the appropriate label directions. Sanitizing reduces the number of bacteria on a surface to an acceptable limit, but does not include efficacy against viruses and fungi. Disinfection further reduces the number of pathogens on a surface, including efficacy against vegetative bacteria, fungi and viruses. Disinfection is what you should be looking to achieve for your surfaces and equipment in cannabis facilities.

4

BEING UNAWARE OF THE SHELF-LIFE OF THE SELECTED DISINFECTANT

Disinfectants will have an expiry date, and the product should not be used after that date is reached, as the efficacy may be affected. If using a concentrated product, the use-solution will likely have a shorter shelf-life compared to the undiluted concentrate. It is important to keep track of these expiry dates, and properly discard any product that has not been used by this date.

5

TOPPING OFF DILUTED DISINFECTANT BOTTLES

Topping off diluted disinfectant bottles will result in mixing newer solutions with an older solution, making it difficult to keep track of the expiry date of the original solution. Once a bottle is empty, it should be rinsed, dried, and replaced with a fresh solution each time.

6

MIXING DISINFECTANTS WITH OTHER CHEMICALS

Mixing disinfectants with other chemicals is never advised – at best, it could lead to an over-diluted or ineffective solution, and at worst, it could lead to potentially dangerous reactions. Chemicals used for cleaning and disinfecting should be used only as directed and should never be mixed with anything unless specifically indicated on the label or by the manufacturer.

7**SPRAYING A SURFACE AND THEN WIPING IT WITH A DRY CLOTH**

If a surface is immediately wiped dry after the disinfectant is applied, the disinfectant's contact time will not be achieved. The disinfectant must be allowed to remain wet for the full duration of the product's label-indicated contact time to be effective.

8**FAILING TO GIVE PRODUCT-SPECIFIC TRAINING TO TEAM MEMBERS**

Even though your staff may have previously used disinfectants, they should receive regular training about how to properly use any new product introduced at your facility. Each disinfectant product will have unique features and will require specific training on its chemistry, safety, and application.

9**FAILING TO RECEIVE AGREEMENT FROM TEAM REGARDING SWITCHING TO A NEW PRODUCT**

Cleaning and disinfecting is a team effort. It is important to make sure that your staff is not only comfortable using the selected disinfectant, but also with the overall cleaning and disinfecting process. This is the single-most important factor when measuring compliance of an infection prevention program.

10**FAILING TO PRE-CLEAN VISIBLE SOILS ON SURFACES PRIOR TO DISINFECTING**

Even if using a one-step cleaner and disinfectant, it is still important to ensure that gross organic debris is removed. This is imperative in order for the disinfectant to work properly. Even disinfectants with the most effective cleaning capabilities will not perform optimally in the presence of large amounts of dirt. Use a scraping tool to dry-clean heavily soiled surfaces prior to applying the disinfectant product.

WORKING HAND-IN-HAND

Although the importance of selecting the right disinfectant product cannot be overstated, it is just as important to pair the product with the appropriate application system for best results.

DILUTING YOUR DISINFECTANT

Many disinfectant products are concentrated, requiring dilution with water prior to use. If using a concentrate, here are a few options to easily dispense the correct amount to reach the required dilution:

MANUALLY

- Hand pumps or measuring cups can be used to accurately dispense a specified amount of concentrate. Hand pumps can often be inserted into drums or pails of a disinfectant.

MIXING STATION

- These are systems designed to automatically dilute a disinfectant to the specified concentration. Mixing stations are highly valuable tools in ensuring accurate dilution and eliminating potential human error from the process. Remember to calibrate the unit with test strips, if available, with initial set-up to ensure the appropriate solution will be dispensed every time and implement a preventative maintenance program to keep them in working order.

APPLYING YOUR DISINFECTANT

The application method you select will depend on the set-up of your facility. If you have access to a pressure washer that can support a foamer attachment, this can be a convenient way to quickly cover large surface areas such as walls, floors and ceilings with the disinfectant. This will also be dependent on your room setup and growing schedule. If electrical outlets are covered and the plants or cannabis product can be removed from the room, foaming is a great option.

If you don't have access to high-pressure water, a pump-up foamer may be a reasonable alternative. This uses manual pressure to dispense the solution in a similar fashion to a pressure washer application.

THE FOLLOWING PROCEDURE IS COMMONLY USED IN LARGER AREAS:

- 1** Remove all plants from the room, if possible.
- 2** Use a scraping tool or microfiber to dry-clean any major dirt or debris from the area if heavily soiled.
- 3** If using a disinfectant without detergency properties, pre-clean the surface by applying a detergent, and scrub the surface to loosen soils. Rinse the surface prior to disinfecting.
- 4** If the disinfectant has detergency properties, this may be used in place of a separate detergent. Simply apply the disinfectant, from bottom to top, and scrub to loosen soils. Once the disinfectant's contact time has been reached, rinse the surface, from top to bottom.
- 5** If using disinfectant chemicals on a surface that comes into direct contact with cannabis, rinse the surface with potable water after the contact time.
- 6** Reintroduce plants into the room.

This method is ideal for areas that have drains available to flush excess chemical and water. If a drain is not available, it will likely be better to use a microfibre mop to scrub walls with disinfectant solution.

Mopping is a commonly used method for disinfecting floors. A mop bucket may be filled with a disinfectant solution and applied in a figure-eight fashion, from the cleanest area to the dirtiest (to prevent recontamination from dirtier surfaces back onto clean ones). Mopping solutions should be refreshed daily, or sooner if the liquid is cloudy or visibly soiled. If any stickiness is left behind on the floor over time, an occasional rinse with water after the contact time, may help mitigate this. Try to avoid stepping on any surfaces once they have been covered by the disinfectant, to avoid contamination. Bucketless mopping systems may also be used in place of a traditional mop and bucket, though as with any tool, it's important to do some research to find the right one for your facility.

For smaller areas, wiping surfaces is a great option – this can be accomplished with pre-soaked disinfectant wipes, or by using a microfibre cloth. The physical action of wiping the surface will help ensure that the surface is evenly covered by the disinfectant and will also clean and lift dirt and pathogens. A trigger foamer may also be used to spray the disinfectant onto the surface. Foaming applications are preferred over traditional spray bottles, as foaming helps keep the surface wet for the duration of the contact time and reduces aerosolization of chemicals and pathogens.

With any cleaning substrate, whether it be a cloth or mop head, a factor that often gets overlooked is the potential for interactions between the material and the cleaning chemical used. For instance, quaternary ammonium compounds (Quats) are known to interact with cotton, which can reduce the efficacy of the disinfectant on the surface. When designing your procedure, make sure that you take any potential interactions into consideration.¹¹

A common application method for larger rooms is to dispense the disinfectant using a fogger, mister or electrostatic sprayer. While this method can be effective, there is no standard protocol that exists, and each apparatus may operate slightly differently. For this application (or any other) to be effective, the disinfectant must evenly cover the entire surface area and remain wet for the length of the contact time. It's important to keep in mind that fogging, misting and electrostatic spraying does not provide any mechanism of cleaning, so if used, a pre-cleaning step would be required to remove any dirt or debris prior to applying the disinfectant.



VALIDATION

The last step in the cleaning and disinfecting process is periodically validating that your protocols are working properly.

The following strategies can be implemented:

TEST STRIPS

- When using concentrated disinfectant products, test strips may be made available by the manufacturer to ensure that the concentration of active ingredient is correct. These should be used to regularly validate the strength of your solution.

ADENOSINE TRIPHOSPHATE (ATP) TESTING

- This may be used to validate the effectiveness of your disinfection, by determining the presence of organic contamination on surfaces following disinfection. When using ATP testing, it is important to establish baseline ranges in order to properly assess the effectiveness of the disinfectant. Additionally, ATP testing cannot be used effectively to compare the effectiveness of different disinfectant products.¹²

For more information about ATP testing, visit: <https://shyield.ca/blog/>

It is critical to the health of your plants and your team to develop a disinfection program that is the right fit for your facility and compliant with local regulations. Incorporating these concepts into your facility's cleaning and disinfection program, will help you achieve a higher standard of infection prevention.

GLOSSARY OF TERMS

Adenosine triphosphate (ATP) testing

The use of an ATP meter to validate the efficacy of the cleaning and disinfection procedure. An ATP meter will instantly provide information about the total bioburden on a surface, measured in relative light units (RLUs).

Biological controls

The process of using organisms to control pests. This includes beneficial insects, nematodes and mites.¹

Chemical controls

The use of registered pesticides on plants. These pesticides may be naturally derived or synthetic.¹

Cleaning

The process of physically removing dirt and debris from a surface.

Compatibility

Whether a disinfectant will cause any adverse effects on the surface on which it is applied. A compatible disinfectant will not cause any damage to the surface acutely or over time. Every disinfectant will have a unique compatibility profile that must be considered.

Contact time

The length of time that a disinfectant must remain wet on a surface for disinfection to occur.

Cultural controls

Growing conditions that help reduce the ability of pests to thrive. This may include choosing resistant varieties, providing proper plant nutrition, as well as pruning and sanitation of the growing facility.¹

Detergency

The ability of a disinfectant to remove soils from a surface, and function as a one-step cleaner-disinfectant. Disinfectants with strong detergency properties will contain surfactants (detergents) in their formulations.

Disinfection

The process of killing microorganisms on a surface, including viruses, bacteria and fungi.

Dry-cleaning

Using a brush, broom, mop or scraping tool to remove visible dirt without the aid of water or any liquid cleaning products. This helps remove gross soils in advance of cleaning and disinfection.

Efficacy

The ability of a disinfectant to kill pathogens.

- Fungicidal efficacy is the ability of a disinfectant to kill fungi, using the organism *Trichophyton mentagrophytes* as a surrogate.
- Bactericidal efficacy is the ability of a disinfectant to kill bacteria. Products capable of killing *Staphylococcus aureus* and *Pseudomonas aeruginosa*, considered to be hospital disinfectants.
- Virucidal efficacy is the ability of a disinfectant to kill viruses.

Fomite

An inanimate object that harbours pathogens. Fomites can serve as a mode of transmission for pathogens to be spread through touching the surface.

Integrated pest management (IPM)

A decision-making process for managing pests in an effective, economical, and environmentally sound way.¹

Label

Located on a disinfectant, the label on the container will contain important information, such as the Drug Identification Number, the efficacy claims, and relevant storage and disposal considerations.

Mode of transmission

The mechanism that a pathogen uses to spread from one host to another.

Pathogen

An infectious agent that causes disease in an organism. Most cannabis pathogens are fungi, but viruses and bacteria may also be examples.

Physical controls

Strategies to physically prevent the entry of pests onto plants. This may include the use of traps, screens or other barriers.¹

Safety Data Sheets (SDS)

Documents containing relevant information about the safety profile of a product, including disinfectants. Section 2 of the SDS contains important information about health hazards associated with the product.

Sanitizing

The process of reducing vegetative bacteria on a surface to a safe level, as designated by public health or other standards.

Shelf-life

The length of time that a disinfectant may be used, often noted by an expiry date on the container. Concentrated products may have a shorter shelf-life once diluted.

Test strips

Strips that may be used to validate the concentration of active ingredient within disinfectants. When preparing a diluted solution, test strips may be offered to ensure that the dilution has been performed correctly.

1. Province of British Columbia: Ministry of Environment and Climate Change Strategy (2019). Integrated Pest Management for Commercial Cannabis in BC.
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3. Rutala WA, Weber DJ and Healthcare Infection Control Practices Advisory Committee (HICPAC). (2008). Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008.
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5. Favero MS, Bond WW. Chemical disinfection of medical and surgical materials. (2001). In: Block SS, ed. Disinfection, sterilization, and preservation. Philadelphia: Lippincott Williams & Wilkins, 881-917.
6. Rutala WA, Weber DJ. (2014). Selection of the ideal disinfectant. *Infect Control Hosp Epidemiol* 35(7):855-65.
7. Arif AA, Delclos GL, Serra C. (2009). Occupational exposures and asthma among nursing professionals. *Occup Environ Med* 66:274-8.
8. Acute Antimicrobial Pesticide-Related Illnesses Among Workers in Healthcare Facilities – California, Louisiana, Michigan, and Texas, 2002-2007, CDC Weekly Morbidity and Mortality Report, May 14, 2010.
9. Government of Canada: Canadian Food Inspection Agency (2018). Biosecurity for Canadian Cervid Farms Producer Planning Guide.
10. Hong Y, Teska PJ, Oliver HF. (2017). Effects of contact time and concentration on bactericidal efficacy of 3 disinfectants on hard non-porous surfaces. *Am. J. Infect. Control.* 45:1284-5.
11. Boyce JM, et al. (2016). Quaternary ammonium disinfectant issues encountered in an environmental services department. *ICHE* 37(3):340-342.
12. Omidbakhsh N, et al. (2014). How reliable are ATP bioluminescence meters in assessing decontamination of environmental surfaces in healthcare settings? *PLOS One* 9(6):e99951.

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