



From the Start: Keeping it Clean

Follow these steps to maintain a healthy crop throughout each stage of cultivation.

By Chad Cagle

We have all heard the phrase “You have to start clean to end clean.” There are many ways to approach this. A regular routine of best practices along with integrated pest management (IPM) can achieve a clean and sanitized growing environment. As with anything, please check with your state and local governments and ensure you are in compliance, have completed all training and have all licenses necessary to use any cleaning or sanitizing product. Please read all labels before use. Also, always keep in mind what you are spraying or fogging and where it might drift or cross contaminate other plants, cultivation surfaces, or regulated areas.

ENVIRONMENT

Whether you have an indoor grow or greenhouse operation, the importance of a clean growing area is still

the same — rid the area of any habitat that is beneficial to disease, pests, fungus or microbes. This includes being vigilant and paying attention to details like eliminating standing wet areas where algae or mold can grow and cleaning up organic matter (such as leaves and other debris), which provide food and habitat for insects and diseases. The goal is to reduce all carryover of any contaminants.

The environment you operate in will dictate the best method of cleaning and sanitization. For example, an auto-sweeper or auto-vac can be of service if you have concrete floors and a large area. If not, a shop vac or broom will need to be used. You should always be aware of dust and other possible contaminants you might be sweeping and spreading in the air. No matter what, automation is always useful in sanitation practices. Once you have all the debris



Personal protective equipment, such as lab coats and gloves, protects plants from contaminants. Photos: Cresco Labs

and organic matter out of the area you have completed the cleaning process.

Now for sanitation.

There are several ways to sanitize. Some growers use ozone or UV sterilization. Bio-foaming or fogging are both quick and effective methods to get into every nook and cranny inside the greenhouse. Foam stays on surfaces longer than pressure washing or spraying. This allows the foam to have longer surface contact with contaminated areas, which in turn provides a more sanitized greenhouse. In addition to application methods, there are many sprays, fog and foam chemicals that can be used to sanitize.

For example:

1. Sodium hypochlorite (bleach) is effective on most fungi/bacteria and some viruses. Contact time is around 20 minutes at a 10% solution. It is highly corrosive on certain surfaces.
2. Quaternary ammonia products are effective on most fungi/bacteria/algae and some viruses. Contact time is around 30 minutes with minimal corrosiveness on certain surfaces.
3. Hydrogen peroxide products are effective on fungi/bacteria and most viruses. Contact time is 30 minutes. It can be corrosive to some surfaces.

MOTHER STOCK

Once you get your environment clean and sanitized, it is time to focus on the plants. Clean stock plants are the most important part of production. If your stock plants are compromised, all your clones will be as well, which will result in a domino effect of poor plant health all the way through harvest. To accomplish clean stock, attention to detail must be your focus.

A separate clean entry area is desirable for the mother stock room. This is to keep all outside contaminants from being brought into the stock area. Upon entering the clean

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entry, a person will need to wash/sanitize their hands and put on personal protective equipment (PPE).

PPE required across all cultivation areas includes hairnets, beard nets, shoe covers, lab coats and gloves.

Once inside the stock area you must maintain a rigorous routine for all mother plants. The routine includes a new rotation of strains every 18 to 20 weeks, weekly scouting and a planned organic biological spray schedule with the release of predatory insects. We perform weekly virus, tissue, water and soil tests for monitoring of our stock plants. Keeping a close eye on all these items in stock production helps keep the plants as clean as possible.

Note, some growers will purchase tissue culture (TC) or clones from suppliers. If purchasing plant material from a third party, be sure to inspect every plant in the shipment for pests and disease.

CUTTINGS

Taking clean cuttings or clones is an important part of the process as well. When you snip the cutting off the plant it creates a wound that could lead to the spread of viruses and viroids. It is important to clean the cutting tools and containers after each use. It is essential to change gloves and switch cutting tools between varieties. This will limit any contamination to a strain and stop the spread of any virus or disease if present.

This is also a great time for the employees making the cuts to examine plants for any pests, disease or fungus. After taking cuttings, it is important not to let them become contaminated. This can be achieved by keeping the cuttings in a sanitized container until they can be transplanted. A sanitized cooler or refrigerator at 38 to 40° F can be a helpful tool if you are not able to stick right away.

STICKING

Before sticking cuttings, all surface areas must be cleaned and sanitized. This process will need to be repeated between each strain. Gloves will also be changed and tools sanitized after each change in variety. Some cannabis producers cut/trim the leaf

tips before sticking. Research studies (www.doi.org/10.1139/cjps-2018-0038) have shown up to 18% better rooting percentages if foliage remains uncut. Also, better root quality if three leaves are left attached to the cutting. Another benefit of not cutting the leaf tips is that you reduce the risk of transmitting virus and disease by not cutting the plant.

A common practice in the ornamental world of propagation was dipping cuttings before sticking them. This practice works equally well with cannabis. Dipping clones for 45 seconds in a mixture of all-natural fungicide and organic pesticide has helped me fight pests and disease. I have found that full immersion dips have resulted in better rooting, less fungus and reduced pest pressure across in rooting and across all subsequent stages of the plant's growth. After clones are dipped or immersed, the bottom tips of the stems are dipped in a rooting hormone. The hormone is particularly useful with harder to root varieties.

Traditional cannabis propagation uses rooting domes and trays. It can take a lot of time draining, venting and monitoring trays depending on how many cuttings you are rooting. We were able to eliminate the use of domes with the addition of dry fog units in our propagation house. By using these processes, we will have clean, disease- and pest-free clones that are ready to transplant in 10 to 14 days.

VEG AND FLOWER

Vegetative and flower cycles will depend on the cultivator and the genetics of the plant. This is one of the most opportune times for pests and disease because the plants are older. Preventative measures are the best way to keep the plants clean. Creating unfavorable environmental conditions for fungus and mold by keeping the humidity levels low and stable temperatures will help.

Daily scouting is important to ensure quick reaction times. Weekly organic sprays (biweekly if pressures necessitate) for pests and fungus are performed up until four weeks before harvest. Beneficial insects are brought in weekly



and dispersed throughout the crop. If there is the presence of a pest or fungus, it is best to catch it in low numbers so that it can be removed altogether. Be mindful as you discard not to add to the spread. Discarding in a sealed bag or container is best until you reach an outside cannabis waste receptor.

TRAINING AND KEEPING DATA

Keeping the environment and all stages of the plant clean is a big feat. It takes a lot of time and planning to get it right. Attention to detail is a must. Also, being able to act fast and come up with solutions in a timely manner is key. Educating employees on sanitation procedures and why each is important helps achieve a clean environment. Once a person is trained and understands the reasons behind a practice, they have the ability to come up with their own ideas on how to make the process better.

Finally, constant experimentation is necessary to stay ahead. We are constantly trialing new products and

procedures for all stages of cultivation. Repeating trials to double check results is a common practice, as some tests may be skewed by certain factors that we may not be aware of at the time. Keeping data and recording results is an important part of this process. Data is key to making educated decisions and helps to prevent repeating mistakes. Tracking chemical efficacy, predator viability, genetic data, rooting yields, environmental controls and fertilizer rates, are all important in the cultivation of cannabis.

Cannabis has not had the long history of research other commercially produced plants have. There is still so much to learn about cannabis cultivation and that is what makes it exciting and interesting to grow. ❖

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Carpinteria, California facility. For more information, visit www.crescolabs.com.



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