HYDRA CLEAR

MULTI-ENZYME LINE CLEANER

Easily and consistently remove buildup in feeding lines and systems with our top-quality, all-natural enzymatic line cleaner.

- Eliminate unnecessary bio-film bacteria and fungi that accumulates on surfaces and in closed systems.
- Save money due to blocked lines, clogged emitters and bio-film residue that can result in lost crops.
- Commercial strength formula combines natural bacteria and enzymes in a powerful1:100 concentration.



EMERALD HARVEST®



CLEAN AND CLEAR

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SIMPLE, EASY SUCCESS

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HYDRA CLEAR

What is Hydra Clear?
Hydra Clear is a powerful, multi-enzyme line cleaner that is a safe and natural way to eliminate harmful biofilms in the grow room.
Hydra Clear is the natural next step in our product line. By clearing away clogs and biofilms, it ensures that the full amount of the investment a grower makes in nutrients gets through the feeding system to the plant roots. Hydra Clear maintains better hygiene for better harvests.

Clogs in the system?
Hydra Clear tackles one of the most challenging problems faced by growers who use organic or as-good-as-organic fertilizers: clogging. And it does so without harsh chemicals that harm plants or the environment. A clog in the feeding system's lines, emitters or drains can result in water or nutrient solution being unevenly applied throughout a garden or grow-op. Some plants might get less water or nutrients than others—perhaps even less than they need—reducing the consistency, quality, and yield of harvests.

Clogging can be physical, chemical or biological:

- **Physical clogs** are solid buildups. They might consist of suspended solids too tiny to perceive with the naked eye. Dealing with a physical clog is often as easy as forcing more water through the system to blow the obstruction out of the nearest exit point.
- **Chemical clogs** are composed of iron, salts or other compounds that precipitate and accumulate on surfaces inside hoses, emitters and other hydroponic components, constricting the flow of water or nutrient solution. Such chemicals are often introduced through a contaminated water supply, but they may also be by-products of feeding. Cleaning chemical clogs usually involves shutting down hydroponic systems and using a chemical cleaner.
- **Biological clogs** are the result of biomasses that build up on warm, moist surfaces. They can be caused by bacteria, fungi or algae and may increase the risk of plant disease. When building root colonies, many microbes produce biofilm—goo or slime—that can grow exponentially, obstructing the flow of water and nutrients. An obstruction might also consist of the fungi or algae themselves.

What is bio-film?
Have you ever neglected to brush your teeth before going to bed, maybe after a late night out? When you wake up, you can feel—perhaps even see—a slimy, scummy coating on your teeth. It wasn't there before your head hit the pillow, but if you leave it long enough, this biofilm will turn into plaque. In fact, observing plaque on human teeth led to the first scientific discovery of biofilm, back in 1684. Now, you can easily brush your teeth to help keep plaque at bay. But you wouldn't be able to go over every inch of a hydroponic system with a toothbrush. Biofilms form when microbes (bacteria, fungi or algae) adhere to a surface. The microbes establish a microscopic colony and begin to exude a viscous layer of goo or slime known as EPS. Once this EPS is in place and matures, the colony grows and disperses, using the EPS to expand. The EPS is not just a way for microbes to travel outward; it also protects them, particularly from rival microbes. Biofilms are adept survivors—they don't especially mind high or low pH, warm or cold water, plenty of nutrients or not too many. Researchers have observed that the initial stage of biofilm formation can take as little as five seconds after freshly chlorinated municipal water is introduced into new, clean, highly polished stainless-steel pipes. Imagine what unchlorinated water could do!

Water is the source of the problem.
Unsurprisingly, the source of a biofilm problem in a cannabis grow operation is usually water. Growers may fight stubborn, repeated fungal outbreaks, not realizing that the water is the source of the infection. In particular, cannabis growers often find themselves fighting Fusarium fungus and water molds:
Fusarium is a large genus of fungi whose variants also infect barley, daffodils and human fingernails, to name a few. According to Wikipedia, Fusarium oxysporum was responsible for wiping out an entire type of banana in the 1950s. Water molds are potentially even worse. **Phytophthora** caused the potato blight during Ireland's Great Famine. It's associated with dieback and root rot, as is **Pythium**, which lurks in greenhouses, weakening crops and killing seedlings.

How does Hydra Clear work?
With its powerful enzyme formulation, Hydra Clear is the natural way to eliminate biofilm clogs, eliminating the risk of wasting nutrients and unsatisfactory or inconsistent harvests. Enzymes are proteins that act as biological catalysts, or biocatalysts. Biocatalysts trigger and accelerate chemical reactions in living things. For example, certain enzymes make it possible for carbon dioxide to transfer from the blood to the lungs, where it is exhaled. Other enzymes trigger processes that break down bodily substances for easy removal; they act as a biological cleansers. Major laundry brands have been including biological agents in their formulations since the 60s. Because enzymes can target particular processes, they can clean specific biofilms from hydronic systems without collateral damage. The enzymes that target unwanted biofilms and accelerate their degradation do not corrode grow room hardware or irritate the colonies of good bacteria living in the roots. Additionally, runoff from an enzymatic cleaner is non-toxic and has much less impact on the environment than a traditional detergent or other biofilm eliminator. Hydra Clear can be used between crop life cycles to clean a hydroponic system thoroughly over the course of an eight-hour treatment or as a preventative measure by applying a diluted amount during a regular feeding program. Take great care in doing the latter, however, lest you inadvertently wipe out the beneficial microbes in the rhizosphere—or even damage the roots themselves.

Can I use Hydra Clear with another nutrient line?
Yes. While we hope that growers are using Hydra Clear along with a full line of Emerald Harvest products, Hydra Clear is not brand specific and can be used anywhere biofilm accumulates.

The statements made herein are based on secondary scientific research into the raw materials in our products. They do not necessarily constitute product claims approved by fertilizer regulators. This information is intended for internal use as educational material the Emerald Harvest team on the science behind our products, including possible benefits and features.