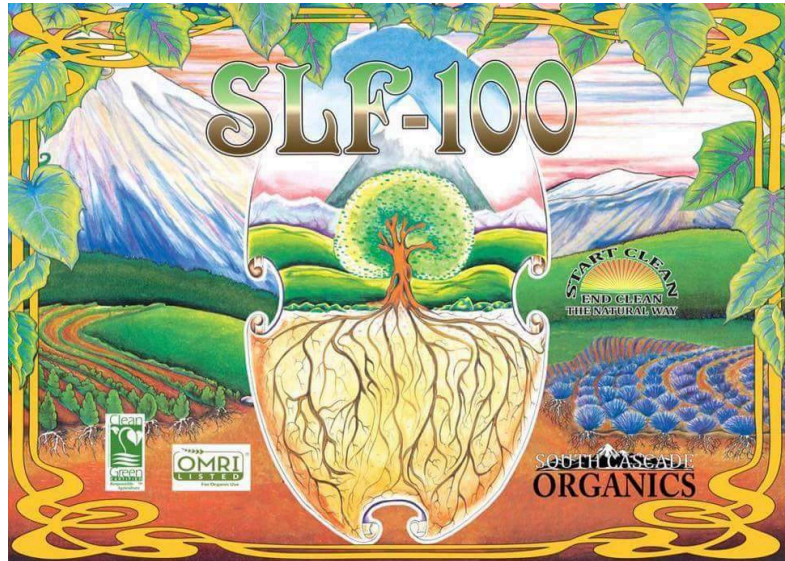


# UNOFFICIAL GUIDE TO SLF-100 v2.0

Submerged Liquid Fermentation

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**Disclaimer:**

*This guide will be updated from time to time. Any and all updates will be issued through the SLF Soldiers Facebook Page. The information in this guide may or may not be up to date, and/or there may be information that is missing or has been taken out of context and no longer applies. In short, check for the latest release in the group. Any and all updates will have the date at the top of the guide.*



***“I have a passion for bacteria and what they can do and know that our current knowledge of them is extremely limited. I also love to promote products that do what they say they’ll do. Also, when the people behind them are people that I could call family... if the product works, and the mindset of the people behind it is in the right place, then by all means support and promote the product. It’s about growing families, plants and then businesses... and only growing businesses that promote family first.” – Newton Hayes***

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## SLF-100

SLF-100 is a commercially proven enzymatic formula with over 18 years of proven success. It is a 100% organic and OMRI listed formula specifically designed to break out salts. Used as a cleanser for hydroponic systems and soilless media SLF-100 goes to work immediately to keep your system running smooth and free of toxic build up.

SLF-100 is effective in all phases of the growing cycle and is compatible with all nutrients, fertilizers and rooting compounds. SLF-100 is also compatible with H<sub>2</sub>O<sub>2</sub> (Hydrogen Peroxide). Thanks to a proprietary blend of naturally occurring enzymes, SLF-100 is pH neutral in concentrated form and has NO added sugars or NPK.

As part of its proven enzymatic formula, South Cascade Organics utilizes *Bacillus thuringiensis* and *Pseudomonas putida* for their ability to break down nutrients and organic matter into enzymes like amino acids which feed plants. As an added side effect, *Bacillus thuringiensis* produces a crystalline protein that when ingested by the larvae of fungus gnats, the protein cuts the gut of the larvae- effectively killing it. In addition, the inoculants are designed to completely solubilize all forms of organic fertilizers from compost to bone meal to feather meal to salt based fertilizers.

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### In your own words Newton, what is SLF-100?

“I want to post what SLF-100 is rather than a bunch of hype. That way, you can do the research if you want. SLF stands for Submerged Liquid Fermentation. SLF is a microbe based enzymatic product. We start with a base of microbes which we add to several species of grasses that we grow. We then bring in plants from extreme environments, for their ability to survive those extremes, and we let it ferment. Most of the plants we bring in are proprietary but one plant comes from a salt flat for the plants ability to survive high EC's. From this plant we get bacteria like *Virgibacillus pantothenicus* which is known to help plants survive osmotic stress and produces enzymes necessary to remediate high salt environments. SLF-100 was actually created to break down salts. Breaking phosphorus bonds and calcium build up (bone gum) are beneficial side effects from the use of SLF-100. It is not just a microbial product. There are microbes left from the fermentation process and researching the specific microbes will help to understand what the product is capable of.

SLF-100 is: A formulation of multiple species of bacteria, however there are four that really stand out and make their presence known.

- *Pseudomonas putida* - Phosphor solubilizer - amazing bacteria, also an antagonist for pythium and fusarium.
- *Virgibacillus pantothenicus* - production of ectoine and proline, causes plants to adapt to environmental stressors - among many other things
- *Bacillus thuringiensis* - helps with some pests - also has anti-pathogenic properties.

- Bacillus subtilus - catalase-positive bacteria - meaning given the ability to grow overnight in a simple sugar medium and added to H<sub>2</sub>O<sub>2</sub> it will break the extra oxygen atom off the end - the real enzyme test.” ~ Newton Hayes

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## Which bacteria in your product is the most beneficial?

“All these bacteria have many, many advantages alone but do amazing things together as well. SLF-100 bacteria are mostly in a dormant stage, obviously for shelf life in the concentrated form. Craziest thing about SLF-100 is Pseudomonas putida is strictly aerobic bacteria - meaning it needs air to live. We have tested SLF-100 after seven years of sitting and it is still the most prevalent bacteria in the formula. Used as the concentrated form with Nectar For the Gods products is where we see their synergistic effect together. Breaking down calcium or bone gum takes more than one type of bacteria and at the right balance.” ~ Newton Hayes

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## Do you have any lab reports?

“Sure, I wanted to post this lab report here in lieu of recent questions about SLF-100 and the bacteria in it. We have had this for some time but didn't want to necessarily narrow down our product. Remember our main focus is not just bacteria, although at these numbers, SLF-100 has a decent concentration at 1,220,000,000/ml. I do want my friends and customers to have the knowledge they need especially when marketing 'seeds' argue with them. We aren't looking to compete with products as we feel we have something completely different than anyone else and competition is the bane of corporations and greed. If it works for you fine, if it doesn't work for you that too is totally fine. What I want to see is a little less, 'my product is better than yours' and a little more 'hey let's do lunch a figure out how we can work together'. Our product is a whole plant product and these numbers can vary from batch to batch but that's what makes the product (whole plant vs synthesized and/or hand-picked bacteria and enzymes). If we label as a bacteria product I feel that we do SLF-100 a disservice. Being a whole plant based product brings so much more than just bacteria and enzymes, it brings a balance.

Also, the Bacillus that is *genus only* in the report is, in fact, our Virgibacillus pantothenicus. When I spoke with her she told me they didn't have that strain in their database as it was previously Bacillus pantothenicus. So there is some kind of confusion in the database.” ~ Newton Hayes

Microbial Matrix Systems Inc. 2300 Ferry St. Unit #5 Albany, OR 97322		Office: 541-967-0554 Fax: 541-967-4025	
Biological Analysis - Serial Dilution Cultural Media Isolation/Identification			
Client: Newton Hayes			
Sample ID	Isolate ID	CFU/ml	Bacteria ID
SLF 100 A	SLF 100 A	1.00E+09	<i>Pseudomonas putida</i>
SLF 100 B	SLF 100 B	1.00E+07	<i>Bacillus (genus only)</i>
SLF 100 C	SLF 100 C	1.10E+08	<i>Bacillus subtilis</i>
SLF 100 D	SLF 100 D	1.00E+08	<i>Bacillus thuringensis</i>

**Procedure:**

1. A 1:10 serial dilution of product is made using sterile phosphate buffer (1M, pH7.2)
2. A 100uL aliquot of each dilution is spread onto a variety of different cultural media to select for different functional groups and incubated for 24 hours at 28C
3. An examination of each plate is made to determine the most "persistent" and stronger colonies present. A single colony is isolated and purified by growing again onto TSA plates and incubated at 28C for 24 hours.
4. Identification of microorganisms based on a Similarity Index using Fatty Acid Analysis. Once identification is achieved a cross reference is made to the Dilution used to obtain the pure single colony to then calculate the Colony Forming Units of the bacteria.

**Function of identified bacteria:**

*Pseudomonas putida* is a saprotrophic bacterium that can break down alkene and other organic compounds and thus is used in bioremediation. This bacterium is also an effective antagonist for pythium and fusarium. Produces precursor IAA (indole acetic acid). A precursor to Auxin hormone.

*Bacillus thuringensis* is associated with insect control

*Bacillus subtilis* commonly found in soil. Involved in early breakdown of plant and animal residues. Plays role in Nitrogen and Carbon Cycles.

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Where can I learn more about the different bacteria in SLF-100?

*Pseudomonas putida* –

[http://web.mst.edu/~microbio/bio221\\_2007/P\\_putida.htm](http://web.mst.edu/~microbio/bio221_2007/P_putida.htm)

[https://microbewiki.kenyon.edu/index.php/Pseudomonas\\_putida](https://microbewiki.kenyon.edu/index.php/Pseudomonas_putida)

*Virgibacillus pantothenicus* –

<http://aem.asm.org/content/74/14/4560.full>

*Bacillus thuringiensis* –

<http://www.bt.ucsd.edu/>

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3035146/>

<http://www.entomology.wisc.edu/mbcn/fea207.html>

*Bacillus subtilis* –

<http://www.entomology.wisc.edu/mbcn/fea207.html>

[https://en.wikipedia.org/wiki/Bacillus\\_subtilis](https://en.wikipedia.org/wiki/Bacillus_subtilis)

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What has the data shown in relation to the effectiveness of *Bacillus thuringiensis* on fungus gnat larvae?

Many users are reporting success with *Bacillus thuringiensis* (Bt) in SLF-100. Bt has to be eaten to cause mortality. The Bt toxin dissolves in the high pH insect gut and become active. The toxins then attack the gut cells of the insect, punching holes in the lining. The Bt spores spill out of the gut and germinate in the insect causing death within a couple days. Even though the toxin does not kill the insect immediately, treated plant parts will not be damaged because the insect stops feeding within hours. Bt spores do not spread to other insects or cause disease outbreaks on their own.

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What are the recommendations for effective fungus gnat treatment?

The recommended application rate of 5 mL/gal. Some users are reporting success with up to 15 mL/gal.

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I have heard some say they aerate SLF-100 for 24hrs to increase its pest control effectiveness. What is the theory behind this?

“If I could please note that I have retracted my previous statements about brewing strictly to utilize the Bt toxin in SLF-100 for pest control. SLF-100, in concentration, contains the Bt toxin. It has already sporulated due to the fermentation process and should be sufficient for most applications. I now suggest not brewing it just for the Bt, because there is no way of knowing you're creating the perfect conditions to increase the effectiveness of the Bt toxin. Aerating it was a thought/theory I had, for better effect and, to help with overall cost and I may have overstepped my theoretical bounds. Brewing SLF-100 with a compost tea, it will begin to compete with other bacteria. It will depend upon various environmental conditions as to which bacteria will out-compete the others. Think of billions of bacteria doubling every 42-120m; one is going to outperform the others and dominate the medium given more time. Each bacterium in SLF-100 has a different doubling rate or generation rate. *Pseudomonas putida* can double every 60-120 in the first 24 hours and then will slow down. *Bacillus subtilis* doubles every 120m and *Bacillus thuringiensis* can double every 42-84m.

You may not know this, but the foaming action that occurs outside of normal foaming from saponins is caused by the bacteria competing. It is believed they are sequestering nutrients. There are definitely enough bacteria in SLF to have a successful brew, but why not diversify with EWC or Bokashi or even a raw kelp. It really depends on what you want out of your teas and if whatever you're doing is working for you, keep doing it. Until further research demonstrates the proper way to guarantee an increase in the Bt concentrations and that the other bacteria, won't out-compete, it's best to deliver Bt in recommended dosages for root drench. Feedback is always welcomed.” ~ Newton Hayes

When you mention using SLF in concentrated form, are you referring to the weekly 5mL/gal application?

“When I say concentrated form, yes, I mean the normal 5mL/gal, mixed in with normal feed.” ~ Newton Hayes

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I’m having a lot of salt buildup in my medium, will 5mL/gal application rate be enough?

For flush, we use up to 3x the recommended rate for immediate break out. Apply thoroughly once a day for three days.

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Is it ok to use SLF alongside Hygrozyme or will it eliminate my need/use for hygrozyme?

**Question:** I currently mix in 5mL/gal of Hygrozyme into my feed solution every two weeks to maintain enzyme levels to keep dead/dying root masses breaking down. Related to that, slf-100 works well alongside hygrozyme? Or,

**Answer:** “I have several customers that love using SLF and Hygrozyme together while others have eliminated Hygrozyme. Forgive me for asking but why the dead roots? Also, enzymes are provided by bacteria and bacteria thrive where there are roots, alive or dead. I think it's really about keeping the bacterial population bent towards the beneficial side. I am not going to pretend to know more. I enjoy the microbial world immensely and believe it is the 'new frontier'. Try it with Hygrozyme and without and see if you notice a difference. Without saying too much negative about Hygrozyme, I would just say that Hygrozyme is a Cellulase based enzyme product. SLF-100 is an array of beneficial bacteria that provide a host different kinds of enzymes along with their specific attributes.” ~ Newton Hayes

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I’m seeing a buildup of bone gum on top of our mediums, will SLF help eliminate the buildup?

“A 5mL/gal weekly root drench for bone gum breakdown. I believe that some also apply SLF all on its own in between feedings to maximize effectiveness of the nutrients.” ~ Newton Hayes

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## Is there any benefit to foliar feeding SLF? Pest management?

“I have heard of gardeners using atomizers with great results. I tend to tell everyone who asks, that SLF-100 was made for the rhizosphere (soil drench) simply because SLF-100 does not contain a surfactant. So applied with just water SLF-100 will simply bead off and drop to the soil. Using an atomizer will help for leaf penetration with additional benefits when applied with a nutrient foliar recipe that has a surfactant, i.e. aloe or yucca (both good organic sources). I'm assuming the enzymes in SLF-100 irritate or damage the exoskeletons of many pests enough to send them packing. The other reason would be utilizing the subtilis for its effects against Powdery Mildew, but I've heard mixed reviews on that. Some have had luck while others do not.” ~ Newton Hayes

Some users report great results using Yucca extract, such as Nectar for the Gods Hygeia Hydration, as a surfactant. Others report that a silica product, such as Simply Silica from Supreme Growers, works well as an emulsifier when foliar feeding SLF-100. The Silica will allow SLF to stick to the plant.

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## How much SLF-100 do you use in your cloner?

2.5 ml per gallon of RO or distilled water will assist in rooting and keeping the res clean.

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## SLF-100 – Prevent and Cure Pythium (Root Rot)

The enzymes in SLF-100 have been proven to be an effective antagonist for pythium. Hydrolytic enzymes like cellulase and gluconase have been known to combat the pythium fungus. For most, dealing with pythium can be difficult and can result in a complete loss of crops. While some have found yet another use for SLF-100 and saved the life of their plants.

Pythium, the fungus that can wreak havoc on your plants root system, affects first the root tips which are necessary for nutrient and water uptake. Species of Pythium can be found in just about every soil, field, crop, greenhouse and even soilless potting mixes. Pythium is also easily transferred from dirty tools, pots, flats, your pets feet and dirty hands. Fungus nats and shoreflies have also been found to move pythium. If your roots are brown or grey or if your seedlings are dying by damping off, you most likely have a species of pythium affecting your plants. *P. aphanidermatum* and *P. irregulare* are the enemies of the ebb and flow system because they can



form a swimming spore that can move in water. *Pythium ultimum* is mostly associated with sand and soil. It really doesn't matter what species of pythium you have since they all do damage to your plants.

Cellulase and glucanase are hydrolytic enzymes that work on the cell wall of pythium therefore weakening the pathogen and eventually destroying it. Utilizing the enzymes in SLF-100 in soil or hydroponics and especially ebb and flow on a weekly basis will ensure the health of your system. If you haven't been using SLF-100 as a maintenance and preventative tool and have noticed the effects of pythium the sooner you deal with the problem the better off you will be. Bumping up the application of SLF-100 to 3 teaspoons per gallon of water or even direct application by top feeding may help severe cases. The lack of preventative measures like the enzymes in SLF-100 or neglect will result in a failed crop. You must get on top of pythium and fast.

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## Recycling Soils with SLF-100

We have had more questions about recycling soils with SLF-100 recently so we have put this together to answer some of those questions. The quick answer is "yes", you can recycle your soils with SLF-100 sometimes increasing the quality of those soils from the previous year. The enzymes in SLF-100 immediately go to work on your active and slow soil organic matter giving your plants the necessary nutrients to thrive. Soils, especially organic soils, contain soil organic matter (SOM) that has yet to decompose, adding an enzyme like SLF-100 can speed up the decomposition of that SOM reducing the need to buy new soil every year. Adding SLF-100 to soils from previous years will increase the benefits of your soil and prevent immobilization.

Active soil organic matter is primarily made up of fresh plant and animal residues that break down in a very short time, from a few weeks to a few years. This SOM plays a large role in the life of the soil by supplying most of the nutrients for microbial activity. As the enzymes decompose this active SOM they release carbon, nitrogen, phosphorus, potassium and sulfur. If your soil still looks as though it contains high amounts of organic matter amending your soil may not be necessary. If you are unsure amending your soils with alfalfa meal, soybean meal, bone meal, feather meal, finished compost, mushroom compost or other types of organic matter will help with making sure the soil environment remains rich. Along with composts and alfalfa meal we prefer to amend our soil with a bokashi from a reputable source like Southern Oregon Bokashi. Adding bokashi to your soil creates a healthy microbial environment and the added benefit of the inoculated grain provides more organic material for decomposition and soil aggregates.

Enzymes are the catalysts necessary for mineralization. The enzymes in SLF-100 breakdown organic matter but most importantly they break bonds that would immobilize minerals and nutrients thus mineralizing them and making them readily accessible to your plants. Save money and recycle your soil with SLF-100. Added to your soil at 3 teaspoons to a gallon of water to recondition your soil could cost you less than .60 cents a gallon. Three teaspoons to a gallon is only required once at the end or beginning of your season. After that 1 teaspoon per gallon once

a week for maintenance is all that is needed (less than .20 cents per gallon). That is half the recommended rate for hygrozyme.

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I'm ready to make the purchase, but I'm not sure what store near me sells it.

You can use the Store Locator at South Cascade's website:

<http://www.socascade.com/site/stores/>

If there are no local brick and mortar stores near you that sell SLF-100, your next best bet is to purchase it online. PLEASE SUPPORT LOCAL FIRST. If by chance that doesn't work you can find SLF-100 on the web at:

[www.monstergardens.com](http://www.monstergardens.com)

<http://www.seattleshydrospot.com/>

<https://www.oregonconstantgardener.com/store/>

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## Testimonials

"I have been an indoor gardener for several years and when I first started I came across several flushing agents. The first one I tried was flora kleen and it was weak, really didn't notice any benefit. The second one was by botanicare and saw great results. One day I was at my supply shop and the owner led me on to SLF-100. I was a little hesitant to try it due to the fact that I was satisfied with what I had already, but he insisted that I try SLF-100. So my next watering I tried SLF-100. I was more than satisfied; this product is by far the best out on the market. My garden said thanks to me. Not only do I now use SLF-100 for my whole feeding regiment, I decided to contact them for a few questions and the customer service I received was outstanding, they definitely did their job. This is a big thanks to South Cascade Organics, you have helped me improve my garden. Too bad my garden can't speak because it is saying thanks as well." ~ Levi

"BTW, the lady you spoke to from the coast with the powdery mildew problem tried some SLF-100 on a sickly plant and she reports that it did wonders!" ~ H

"Thank you so much SLF-100. I put your product on my plants and it made a huge and noticeable difference. It revived my garden almost immediately and I will definitely be using SLF-100 again." ~ Makai

"SLF-100 is phenomenal!! I have been using it for several months now and have noticed a major difference with both my established plants and transplants. Greener, stronger and more vigorous growth along with extensive root development are the primary traits of note. Thank you for developing such an effective organic product." ~ Fletcher

"I am now four weeks into flower and I can make a few pretty clear distinctions. First off, I had come upon a rather unfortunate bout of spider mites. Along with a 1% mix of neem oil and safer once every 5 days I also applied SLF-100 to the roots and used it as a foliar spray. It has virtually taken the place of other more expensive products. The SLF-100 seems to bother the mites to the point that they are now all but gone. Six weeks have gone by now without any sign of those little pests. Secondly it cleans the heck out of all misting equipment. Thirdly, I can say that using it every 4-5 days actually saved 4 of my plants from root rot." ~ Stephen

"SLF-100 has become a regular part of my regiment. It has especially found its home in my leaching and flushing process. I have noticed a marked improvement in my finished product. One of the first times I used SLF-100 for leaching salts, I applied a heavy dose and waited 30 minutes and then rinsed with fresh water until significant run-off was achieved. The next day I noticed a residue of white to tan salts had formed on the outside of my cloth pots. SLF-100 had helped break down and remove salts to such a degree that the naked eye could even see it. Those are real results you don't need a microscope to understand" ~ J

"I have been using SLF-100 for several months and have definitely seen an impressive improvement in vigor and overall health of my plants. Though, for me, the final proof I needed was after an accidental over feeding I used full strength SLF-100 and let it sit for two hours and then thoroughly flushed my plants again. Within six to seven hours the wilting had stopped progressing and the health of my plants began to restore my garden." ~ V

"I was recently introduced to SLF-100 about a month ago when I received a sample bottle from a helpful representative from South Cascade Organics. I took it home and decided to use it combined with my nutrient regimen. After a few days of use, I noticed the plant seemed more attentive to anything I threw at it, literally it was power feeding, meaning bigger and stronger all the way down to the stock! I'm one week away from flushing and I'm going to use SLF-100. I'm so happy with the results so far, awesome product guys!" ~ Chinaman

"I started carrying SLF-100 about 7 months ago and the feedback has been fantastic. I started using SLF-100 and FulPower along with Clonex solution and the root base I got within eight days were larger than the two inch hole in the Oxy-Cloner, bright white and very healthy. I have also used it in conjunction with Coco Cat on stressed plants and had great results and full recovery of the stressed out veggie's. My customers have had less health issues and also increases in yields from 10-15%. It pays for itself with results" ~ K

"I have been using SLF-100 for approximately 3 months. I saw outstanding results after just the first application. Examining the roots before and after I noticed the SLF-100 roots were solid thick white and even hard to break apart when transplanting. An amazing product and a must buy." ~ Nathan

"I have done side-by-side controlled comparisons. I have seen and have personally proven the results of SLF-100. My plants with SLF-100 had an average of 30% more growth than the plants without SLF-100. Leaf structure was more firm and thicker" ~ Hardan