



Beneficial Microbes for Your Garden by Helga George, Ph.D.



Clarkia in Helga's garden
Photo Helga George

Since the soil is teeming with billions of microorganisms, you already have beneficial microbes in your garden – particularly if you have amended it with compost. However, you can enhance this population by adding specific kinds of microbes.

Many gardeners are familiar with mycorrhizae – the associations of fungi with plant roots that benefit both the plant and the fungus. The fungus gets sugars from the plant, and the plant gets an extension of its roots. This means more

water and the enhanced uptake of nutrients like phosphorous. It also gets assistance in fending off pathogens. These organisms are often called *biofungicides* for these properties.

A very common and frequently utilized mycorrhizal fungus is *Trichoderma*. It has been highly studied, and the powerhouse strain *Trichoderma harzianum* T-22 was created at Cornell University.

In addition to fungi, there are other types of microbes that pack a wallop

to enhance plant growth. Several types of them are bacteria – two species of *Bacillus* and one of *Streptomyces*.

They have a multipronged attack. These microbes help the plants to enhance their levels of resistance, and in other cases, directly attack plant pathogenic fungi by dissolving their cell walls. They are also more effective at using nutrients on the plant roots, so they outcompete other microbes that are less well equipped for this

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Meeting September 17th, 2:00 –Outdoors, bring a chair

New Website Format!

Make sure to check out the updated look of lvbhs.org. Member Allyssa Imano has designed a beautiful site that can be viewed from a computer, tablet and mobile phone.

Guided Tour of the Chaparral Garden

Warren Arnold will be leading a tour of the Chaparral Garden, pointing out plants native to the Burton Mesa Chaparral, as well as other trees and shrubs planted in the garden a number of years ago.

Also, during the afternoon, there will be an opportunity drawing for all members and any new members who sign up.

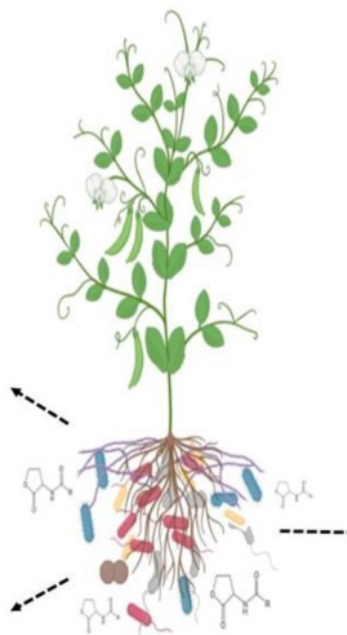
The meeting will begin at 2:00, under the oaks at the Chaparral Garden at Allan Hancock College, Lompoc Campus. Light refresh-

ments will be provided. All garden and botany enthusiasts are welcome, so invite your friends and neighbors to join in.

Please wear sturdy shoes for walking the garden paths, and bring a chair to sit in for the short business meeting before the walk.

Beneficial Microbes, cont.

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Rhizosphere – The nutrient rich area around plant roots that is home to many beneficial bacteria and fungi.

Downward arrow: Adventitious roots (grow directly from the upper part of the plant).

Upward arrow: Resistance to pathogens.

Right arrow: Plant signals lead the microbes to collectively benefit the plant.

Image from Santoyo et al. Agronomy. 2021

environment.

Bacteria in the *Bacillus* genus are well suited for survival. They form spores, which survive harsh conditions much more readily than bacterial cells. Not all of the species of this genus are beneficial. One of them is the organism that causes the deadly disease anthrax.

However, others are so beneficial to plants that they are sold commercially. These include *Bacillus subtilis* and *Bacillus amyloliquefaciens*. Different strains vary in their properties, but most help the plants take up nutrients and are known as *biofertilizers*. In some cases, they produce plant growth hormones.

Another beneficial bacterium that is commonly sold commercially is *Streptomyces lydicus*. This species is a member of a fascinating group that is well equipped to survive in the soil. You may not have thought of

soil in this manner, but it is a very competitive environment with microbes fighting each other tooth and nail for scarce resources.

One of the ways microbes do this is by producing antibiotics to kill each other. Humans have harnessed this power, and many antibiotics, such as streptomycin, were originally isolated from the soil. (See my article “Streptomyces, Antibiotics, and Microbial Conflict in the Soil” for more information on this.)

Nature has done a wonderful job of creating an assortment of beneficial microbes that you use to improve your garden. For more information on these microbes and commercial sources of them, see my articles for gardeners published at Gardener’s Path.

DISCLAIMER: I don’t make any money if you read my articles. - Helga George, Ph.D.

<https://gardenerspath.com/how-to/organic/bacillus-subtilis/>

Controlling Plant Pathogens with the Biofungicide Bacillus Subtilis

<https://gardenerspath.com/how-to/organic/controlling-pathogens-with-organic-biocontrol-agent-bacillus-amyloliquefaciens/>

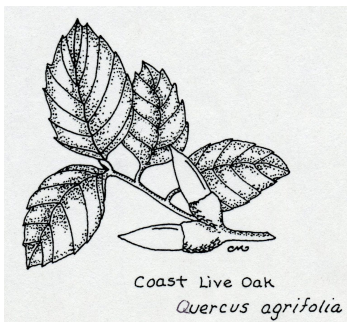
Controlling Pathogens with Organic Biocontrol Agent Bacillus Amyloliquefaciens

<https://gardenerspath.com/how-to/organic/streptomyces-lydicus-use/>

How to use Streptomyces Lydicus to Control Fungal Plant Diseases

<https://gardenerspath.com/how-to/organic/trichoderma/>

Trichoderma Improves Plant Growth and Kills Fungal Pathogens



Quotes of Interest *submitted by Julie Levy*

These were found in a remarkable book titled "A Tree a Day" (checked out from the SB Library) - 365 of the World's Most Majestic Trees, by Amy-Jane Beer, c. 2021.

1. "A man has made at least a start on discovering the meaning of human life when he plants shade trees under which he knows full well he will never sit." -- E. Elton Trueblood, American quaker and theologian.

2. "The best time to plant a tree was 20 years ago. The next best time is now." -- Chinese Proverb

That Plant with the Little Yellow Flowers by Bolivar Shagnasty

Several months ago, one of our members asked, “does anyone know the name of that plant with the little yellow flowers?” “Ah yes, the plant with the little yellow flowers. I know it well...er, that is, I know some of them well. In Ted Niehaus’s book, *Pacific States Wild Flowers*, 109 pages are set aside to describe yellow flowering plants. Of course, with little yellow flowers, that narrows the field somewhat. I have become well acquainted with several of them over the last three months.

You see, I am a plant hunter and plant killer! Five days a week my friend Reymundo and I hunt the nastiest, most treacherous, vilest plant of

our area. And when we find it, we hoe its top off just above the root. We chortle with glee! We hang the carcass on a nearby fence. I like to believe 100 of these nasty creepers have been dispatched by us recently. And what are these notorious monsters? Well, none other than **Puncture Vine**, also known as Goat Head, Cabesa de Chivo, Bindii and Caltrop. You want its botanical name? *Tribulus terrestris*. The scourge of the barefooted, the bicyclist, the wayward dog, the rubber auto tire, and anyone who places his hand on the plant in error.

And what has this to do with plants with little yellow flowers? You guessed

it! Puncture Vine is one of them, and it is blooming now, and will no doubt continue until it dies, judging from the number of vicious seed heads it produces. We are careful to protect the innocent. We pass by the Miniature Evening Primrose, Purslane, Bur Clover, Crete Weed, and Mustard, all with little yellow flowers.

Our crusade against this terrible plant will ultimately end in vain, as seeds of Puncture Vine will persist in the ground for years, and right now, some is traveling in automobile tires as you read this. But through our efforts, fewer will grow next year, and maybe someone else will take up the hoe against it!



Crete Weed
Hedynois rhagadioloides



Black Mustard
Brassica nigra



Bur Clover
Medicago polymorpha



Puncture Vine
Tribulus terrestris



Common Purslane
Portulaca oleracea



Miniature Evening Primrose
Camissoniopsis micrantha

All photos by B. S.

Constitution and Bylaws Changes *Motion up for vote on September 17*

The membership has already voted to amend the Constitution and Bylaws to incorporate the new Communications Committee. We now need to approve the actual wording. I apologize for the delay in getting this going.

I, Mimi Erland, move that the LVBHS Constitution be amended to include the following wording to add the Communications Committee as a Standing Committee to coordinate all internal and external communications of the Newsletter and Publications Committees, along with publicity, such as the website and social media; and the LVBHS Bylaws be amended to include a description of the duties and responsibilities of the Communications Committee:

(Old wording is crossed out, proposed changes are in red.)

Constitution, Article VII

COMMITTEES

Standing committees shall be: (1) Botanic (natural plant); (2) Horticultural; (3) Membership; (4) Education; (5) Newsletter and (6) Publications. **Communications (Newsletter, Publicity, Publications, Website & Social Media).**

Ad Hoc committees may be appointed by the Board of Directors.

By-Laws

12. Responsibilities of the Standing Committees

- **Botanic (natural plant)** - shall coordinate the Society's activities at the Burton Mesa Chaparral Garden.

- **Horticultural** - shall be responsible for encouraging and supporting horticultural interests in the Lompoc Valley.

- **Membership** - shall encourage the expansion of the membership of the Society and shall maintain membership records.

- **Education** - shall make recommendations to the Board of Directors regarding contributions to educational institutions or individuals and shall act as liaison with such organizations and individuals.

- **Newsletter** - shall be responsible for the compilation, publication and distribution of the Society's newsletter.

- **Publications** - shall

~~be responsible for keeping records of the publications (books, videos, DVDs, pamphlets, etc.) of the Society, including, but not limited to, an accounting of the numbers and making recommendations as to when and/or if additional copies will need to be made.~~

Communications - shall be responsible for: the compilation, publication and distribution of the Society's newsletter; keeping records of the publications (books, videos, DVDs, pamphlets, etc.) of the Society, including, but not limited to, an accounting of the numbers and making recommendations as to when and/or if additional copies will need to be made; disseminating information on the Society's programs and activities using tools that generate publicity; implementing and maintaining all strategic social media communications, such as the Society's website, that promote

the Society and increase its visibility.

Please:

Review these changes, and be prepared to discuss the wording if you have questions or suggestions.

At the September 17 meeting, we will ask for a vote on the proposed changes to the Constitution and a separate vote on the amendments to the Bylaws. If you do not have a copy of the full Constitution and Bylaws, please contact me or our Secretary, Kristin Worthley.

Also:

The Board has discussed forming a committee to perform a complete review of the Constitution and Bylaws. It was suggested we simplify the Bylaws and add a separate manual where we could place more detailed descriptions of the duties of each standing committee. If you would like to be on that committee, please let me know.

Sincerely,

Mimi



Lompoc Monkeyflower
Photo Julie Levy

Membership Meeting Minutes *from May 21, 2023*

LVBHS General Membership Meeting
 May 21st, 2023
 Stone Pine Hall, Lompoc

Meeting called to order by Mimi Erland at 2:04 pm. There were a few members who ran late due to their lunch taking longer than expected.

Mimi welcomed all to the meeting. We had guests from the Multi-Flora Garden Club from Paso Robles. We all introduced ourselves.

Business:

Minutes: Request to approve the minutes from March 19, 2023. Minutes approved as written by majority.

Treasurer Report:

Our opening balance on April 18, 2023, was \$16,406.37. Debit -\$154.22 (hardware purchase, plant labels, newsletter, and flyer printing); credit \$45

(membership dues). As of 5/16/23 our closing balance was \$16,297.15. It is recommended to raise dues at least to cover the hall rental. This is to be discussed at the Board Meeting.

Volunteers: We needed two more. Bonnie Bigelow volunteered.

Committee Reports

Botanic: We placed new plant labels at both gardens. We are set to order 20 more labels.

Communications: We spoke about an outreach plan. July 21 we are planning to be at the old town market from 5-8pm. We also discussed our website relaunch.

Announcements: We cancelled our June 3 workday at the Drought Tolerant Garden. We would like to schedule a tour for the Multi Flora Garden Club of our

gardens in the future. Our next meeting is Sept 17.

Business meeting adjourned at 2:30 pm

Our Guest Speaker was running a little late, so we had another guest fill in the time. He was Kenneth Roche. He works in biological solutions for pest control. He explained the product his company provides farmers. It is packets of mites that eat pests that are not wanted.

Our guest speaker arrived. Her name is Shashika Hewavitharana Ph.D. She works at Cal Poly, SLO. She teaches, does research, and works with growers concerning Strawberry diseases. She gave a wonderful and comprehensive presentation. Very informative and well presented.

Minutes by Kristin Worthley, Secretary

Upcoming Events

Membership Meetings

- September 17
- November 19

Garden Care Day

- Oct 21 at the Drought Tolerant Garden on Make a Difference Day.



Perennial Veldtgrass
Erharta calycina

Photos Warren Arnold



Italian Thistle
Carduus pycnocephalus

Two Invasives on the March *by Warren Arnold*

California has always been a destination for many travelers from other parts. Some just visit and leave, while others stay and find their places among those who came before. The recent abundant winter rains have made settling down in

a new home easier for two noticeable foreigners.

One of these is *Ehrharta calycina* which can go by the common name of Perennial Veldtgrass or Purple Veldtgrass. It was first introduced in central Califor-

nia as a possible range forage grass and has since spread over much of the state. Locally it was very noticeable in the Burton Mesa area but strangely not on the valley floor in our town of Lompoc. Many

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Lompoc Valley Botanic and Horticultural Society

LVBHS

C/O Carl Jones—Treasurer
416 North C Street
Lompoc, CA 93436

BOARD MEMBERS:

President

Mimi Erland 315-7105

Vice President

Patcine Beaman 588-7498

Secretary

Kristin Worthley 909-855-9786

Treasurer

Carl Jones rayjones267@yahoo.com

COMMITTEES:

Botany/Chaparral Garden

Elena Jones 450-3668

Charlie Blair 717-0067

Allyssa Imano 588-7598

Horticultural/Drought Tolerant Garden

Mimi Erland 315-7105

Joe Goetz 405/707-8005

Education

Christine Zuhlsdorf
czrelating2plants@gmail.com

History

Need volunteer

Membership

Helga George—the roster 705-6857

Need 2nd volunteer for outreach

COMMUNICATIONS:

Communications Chair; Publicity/ Social Media

Elena Jones edavey@hotmail.com

Books and DVDs

Charlie Blair blaircharles491@yahoo.com

Newsletter Editor

Mimi Erland mimierland1@gmail.com

Website

Julie Levy lvbothortsoc@gmail.com

At Large Representatives:

Elena Jones 450-3668

Bonnie Bigelow 717-0960

Invasives *Cont.*

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other grasses grew abundantly this spring in yards and vacant fields, but no Purple Veldtgrass was seen, but on moving up to Burton Mesa, Purple Veldtgrass was very obvious.

Not only did it grow thickly along the roadsides toward Vandenberg, but it continued over into the San Antonio drainage, across the Santa Maria area and on up Hwy 101 as far as San Luis Obispo. The hillside just east of Shell Beach had a blush of pinkish- purple due to the abundance of the Purple Veldt Grass. This plant seems to prefer sandy soils over the clay loams found locally.

The other noticeable plant this spring was Italian Thistle or Plymouth Thistle. It grows to about four feet high and has purple blossoms.



Photo
Kier
Morse
from
cal-
ipc.org

However, the most outstanding feature of this prolific plant are the spine-covered stems and leaves. It is so spiny that no grazing animal can eat it, at least when it has reached maturity. When it first germinates, it may be tender enough for sheep and goats to feed on it.

Considered to be a noxious weed, eradication by insects and mold has been tried. Unlike Veldtgrass, this thistle seems to prefer alkaline soils. In Lompoc it was first recorded on the road to Surf in 1947, but it now has spread widely into our hills and woodlands. A large mass of it was found along the western perimeter of River Park this spring.